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Inside this issue

Peri-operative Antithrombotic Therapy in Hair Transplantation

Kuniyoshi Yagyu, MD, FISHRS *Tokyo, Japan* nhttkyo11@kioicho.jp

Introduction

Patients under antithrombotic therapy sometimes visit our clinic for hair transplantation. Antithrombotic therapy is of critical importance to prevent serious cardiovascular events in patients with a mechanical heart valve, a coronary artery stent, or atrial fibrillation (Figure 1). Hair transplantation is considered safe surgery, therefore, peri-operative cardiovascular complications must be avoided.[1-6]

Mechanical Heart Valve

Thrombus formation on the metal surface of the mechanical prosthetic heart valve results in malfunction and acute regurgitation of the valve with severe heart failure, which makes the patient critically ill. A thrombosed mechanical heart valve needs to be replaced with a new mechanical heart valve, and replacement surgery is a high-risk procedure.

Peri-operative control of antithrombotic therapy is of critical importance for prevention of thrombotic events and safe surgery in patients with a mechanical heart valve (Figure 2). According to the most recent guidelines, antithrombotic drugs should not be stopped and should be continued in a reduced dose before surgery.

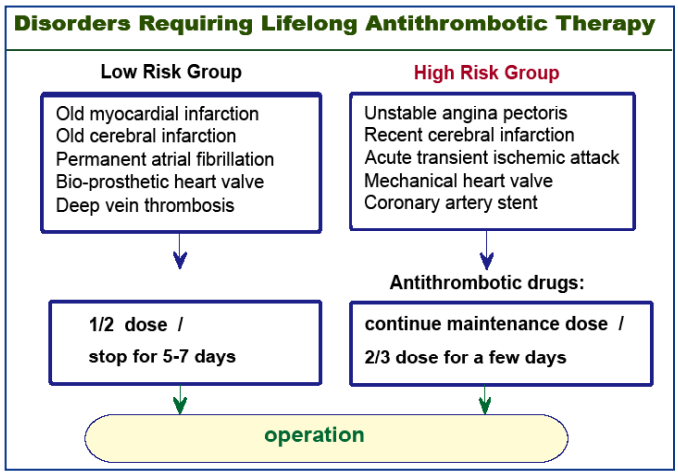

Figure 1. Disorders requiring lifelong antithrombotic therapy.

Bridging Anticoagulation

The author doesn't stop warfarin before surgery in patients with a mechanical heart valve. Some cardiologists and other physicians may recommend stopping warfarin and antiplatelet drugs for one week before surgery. Because it is written in many books, sometimes cardiologists recommend bridging antithrombotic therapy using low molecular weight heparin.

This heparin-bridging regimen is one of incorrect information in modern medicine, and it should not be recommended. There is no evidence based on scientific data for heparin bridging. For more than 30 years, basic scientists

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A note from Dr. True: One of the greatest strengths of our Society is the diversity of backgrounds of our membership. Because of our primary specialties, many of us bring unique expertise to our Society—neurosurgery, urology, facial plastics, dermatology, cardiology, ENT, anesthesiology, etc. And when our members share insights from their background, it often enhances all of our practices. The lead article in this issue is a perfect example. Our immediate Past President, Dr. Kuniyoshi Yagyu, is a cardiologist by training. He has contributed many articles and presentations on the management of cardiology conditions during hair restoration surgery and in this issue he offers a very thorough and clearly written guide to help us provide correct peri-operative management of antithrombotics in hair transplantation.

I also would like to express Dr. Mario Marzola's and my gratitude on behalf of all the members to Dr. Yagyu for his outstanding leadership of our Society. We have been fortunate to have had the right leader at the right time to guide us through some difficult issues. We should hope that other societies and nations will be fortunate to have leaders of the same quality.

On page 252, we share an excerpt from Dr. Yagyu's opening remarks at the 24th ISHRS World Congress just concluded in Las Vegas.

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President: Ken Washenik, MD, PhD, FISHRS
washenik@bosley.com

Executive Director: Victoria Ceh, MPA
vceh@ishrs.org

Editors: Mario Marzola, MBBS
Robert H. True, MD, MPH, FISHRS
editors@ishrs.org

Managing Editor, Graphic Design, & Advertising Sales:
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cduckler@ishrs.org

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President's Message

Ken Washenik, MD, PhD, FISHRS *Beverly Hills, California, USA*
washenik@bosley.com

THANK YOU, MARIO AND BOB!
Drs. Robert H. True & Mario Marzola
Forum Editors, 2014–2016

On behalf of the ISHRS Board of Governors and the membership, I wish to extend a heartfelt THANK YOU to outgoing editors, Drs. Mario Marzola and Bob True, who have published 18 thought-provoking and educationally rich issues for our membership over the past 3 years. This is their last issue, and it is more packed with hairy content than ever, showing their endless ability to stimulate members to contribute articles and continue the ongoing discussions, queries, comments, and opinions about our wonderful field.

In the same spirit, I am pleased to announce our two new editors, Drs. Andreas Finner and Brad Wolf. Drs. Finner and Wolf will begin with the January/February 2017 issue. Below are short biographies about each.

We welcome them to these positions!

Andreas Finner, MD

Dr. Andreas Finner is a German dermatologist who has specialized in hair disorders for more than 18 years. He wrote his doctoral thesis on light and electron microscopy of experimental hair damage and hair care products. He was trained at leading university hair clinics in Germany and completed a fellowship in hair at UBC Vancouver. During these years, he was involved in basic research projects, clinical trials, medical treatments and hair transplantation.

Since 2008, he has been practicing at his Trichomed Hair Clinic in Berlin combining medical therapies and hair transplantation. Dr. Finner has published on hair disorders, has given lectures on hair at conferences, and is a member of the European Expert Group for the establishment of the evidence-based S3 guideline for androgenetic alopecia. He is vice president of the German Society of Hair Surgeons. As co-editor, he aims to contribute to the great value of the *Forum* as an excellent medium for teaching, presenting research, and the exchange of ideas and techniques between members.

Bradley R. Wolf, MD, FISHRS

After two years of general surgery residency and 10 years of Emergency Medicine, Dr. Bradley Wolf has practiced hair restoration exclusively for over 26 years. He has been a member of the ISHRS since the first meeting in Dallas, Texas, in 1992 and became board certified by the ABHRS in its inaugural class in 1998. During the past 20 years, he has given over 50 lectures and participated in numerous workshops as well as live surgeries at hair restoration meetings. He has lectured on a wide variety of topics including the psychological aspects of hair loss, medico-legal issues, recipient site creation/placing, strip excision as well as all aspects of FUE surgery. As a columnist for the *Forum* for the past three years, he has written numerous articles covering a variety of topics and has developed a concise writing style. Dr. Wolf's clinical experience, broad knowledge of the topics, and writing experience have prepared him well to serve as co-editor of the *Forum*.

On a final note, I wish you—our membership—and your families a joyous holiday season as we approach the end of 2016. Our Society is stronger than ever, and we are fortunate to have an amazing membership with diverse backgrounds that brings creative, ingenious ideas all with the intent to continually improve the results for our patients. Here's to continued friendship, collegiality, education, and the ongoing pursuit to help our hair loss patients in 2017!◆

Co-editors' Messages

Mario Marzola, MBBS *Adelaide, South Australia* editors@ISHRS.org

This is the last issue of our beloved *Forum* magazine for your current co-editors, dear readers. Mixed emotions for me and I imagine the same for my friend Dr. Bob True. For three years we have brought together articles on all types of hair subjects—for beginners, for the experienced, for scientists—and from many countries. We reported on so many workshops and conferences bringing new developments and inventions. Sometimes the magazine came together easily, at other times it was a struggle, but always with the good humour of Bob True and our managing editor, Cheryl Duckler, it was much more fun than work. We particularly enjoyed receiving articles from new contributors, first-time publishers from all parts of the world; our thanks to all of you. This is a healthy sign.

The backbone of our *Forum* is our columnists on whom we rely to come up with something interesting, topical, or controversial for just about every edition: Drs. Russell Knudsen (Controversies), Bradley Wolf (Cyberspace Chat), Marco Barusco (Complications), Jerry Cooley (Hair Sciences), Sara Wasserbauer (Hair's the Question), Timothy Carman (How I Do It), Henrique Radwanski (Meetings and Studies), and Nicole Rogers and Jeffrey Donovan (Review of Literature). We thank you for all your efforts over the past three years and apologise for any badgering you may have received when it was close to copy deadlines. You have all been wonderful to work with.

How good is our Society? I am continually amazed by the restless inventiveness of our members, always searching for better outcomes for our patients. It is as if the status quo is not good enough, so we must keep searching. We feed on each other's thoughts and ideas and come back with our own. We all want to contribute. We have critical mass in our Society now, so there's no stopping us. Sooner or later we will understand our mysterious hair follicles, know their secrets and know how to keep them happy and growing at their best. No more miniaturizing from there on!

Nurturing all this in the background is a very professional and able ISHRS Head Office lead by our esteemed Victoria Ceh. She has surrounded herself with like-minded people who serve and stay for so long that it appears to be a family, the same faces year after year. Thank you all for your care, your help, and your encouragement.

To Drs. Bradley Wolf and Andreas Finner, our new co-editors, congratulations and best wishes. In the tradition of all past editors, Dr. True and I stand ready to help at any time should the need arise.

I want to thank my first family for allowing me to spend some Sunday hours at the office in the last three years and the ISHRS, my second family, for this opportunity to serve.◆

Robert H. True, MD, MPH, FISHRS *New York, New York, USA* editors@ISHRS.org

Throughout the history from hair restoration surgery, there have been several times that things have gone awry. Complications and unaesthetic results have frequently occurred. Sometimes this is because a technique, that is inherently flawed, has been popularized among practitioners. Sometimes the underlying cause is not the technique itself but the overly aggressive use of the technique that has lead to problems.

An example of an inherently flawed technique was the "Laser Hair Transplant" of the early 1990s. The laser was promoted as being a more sophisticated way to make recipient sites, and this concept was attractive to consumers because lasers were associated with advanced technology. However, the technique was a disaster. The laser sites were dry and sealed and the grafts didn't survive. Cases of extremely poor growth became rampant and the technique was abandoned within a short period of time.

Another example of an inherently flawed technique was the "multibladed scalpel" for donor harvesting. It was appealing because it was an efficient way to create narrow donor strips to be divided into micro and mini grafts. But the transection rate was so high that it was referred to as "follicular holocaust." For a period of a few years, many patients lost a lot of their potential donor hair due to the technique. Thankfully, this was replaced by single blade donor strip harvesting.

An example of a surgical technique that was not intrinsically flawed but created many problems for patients because of flawed application was the scalp reduction. The intent of the procedure was to reduce the size of the balding scalp so that grafts could be concentrated in a smaller area and produce denser coverage. Unfortunately, too many practitioners turned scalp reduction into "scalp elimination"; that is, rather than using it to reduce the bald scalp they aggressively and repeatedly used it to attempt to eliminate the bald scalp. One or two well-performed scalp reductions would accomplish reduced bald scalp with virtually no problems. But performing three, four, five scalp reductions or trying to take too much in a single procedure would cause deforming scars and slot deformations and scalps so attenuated that they would not support grafts—often disfiguring patients. Overly aggressive use was the flaw. Scalp lifts were a very aggressive form of scalp reduction and the undermining below the nuchal ridge led to some horrific complications of scalp necrosis and permanent sensory loss. Another example of the negative consequences of overly aggressive use of a technique was TPO flaps. Properly done they did produce results that were more aesthetic than standard punch grafts, but when surgeons tried to take too much in a single procedure disfiguring necrosis occurred in both the donor and recipient areas. One could argue that there was an inherent flaw with TPO flaps as well in that they produced unnatural hair direction.

With single-blade donor strip harvesting, I don't think problems have arisen because of any intrinsic flaw but rather because of unskilled and overly aggressive application that has lead to the unsightly donor scars that have become a maligned aspect of the technique.

And now we come to FUE. During the Las Vegas meeting in the Q&A part of a session on FUE, our esteemed colleague Dr.

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OUR APOLOGIES: As co-editors of the ISHRS *Forum* magazine, we, Drs. True and Marzola, wish to apologize unreservedly to Ms. Busra Eryigit, International Sales and Marketing Manager, and to all at Ertip Medical and any punch manufacturer referenced for any offense that may have been taken from comments published in the recent July/August 2016 issue. The views expressed there are not the views of the editors, the magazine, nor of the ISHRS. Dr. Marzola uses Ertip punches and has been a satisfied customer of Ertip Medical for 4 years.

INTERNATIONAL SOCIETY OF HAIR RESTORATION SURGERY

Vision: To establish the ISHRS as a leading unbiased authority in medical and surgical hair restoration.
Mission: To achieve excellence in medical and surgical outcomes by promoting member education, international collegiality, research, ethics, and public awareness.

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Editorial Guidelines for Submission and Acceptance of Articles for the Forum Publication

1. Articles should be written with the intent of sharing scientific information with the purpose of progressing the art and science of hair restoration and benefiting patient outcomes.
2. If results are presented, the medical regimen or surgical techniques that were used to obtain the results should be disclosed in detail.
3. Articles submitted with the sole purpose of promotion or marketing will not be accepted.
4. Authors should acknowledge all funding sources that supported their work as well as any relevant corporate affiliation.
5. Trademarked names should not be used to refer to devices or techniques, when possible.
6. Although we encourage submission of articles that may only contain the author's opinion for the purpose of stimulating thought, the editors may present such articles to colleagues who are experts in the particular area in question, for the purpose of obtaining rebuttal opinions to be published alongside the original article. Occasionally, a manuscript might be sent to an external reviewer, who will judge the manuscript in a blinded fashion to make recommendations about its acceptance, further revision, or rejection.
7. Once the manuscript is accepted, it will be published as soon as possible, depending on space availability.
8. All manuscripts should be submitted to forumeditors@ishrs.org.
9. A completed Author Authorization and Release form—sent as a Word document (not a fax)—must accompany your submission. The form can be obtained in the Members Only section of the Society website at www.ishrs.org.
10. All photos and figures referred to in your article should be sent as ***separate*** attachments in JPEG or TIFF format. Be sure to attach your files to the email. Do NOT embed your files in the email or in the document itself (other than to show placement within the article).
11. Images should be sized no larger than 6 inches in width and should be named using the author's last name and figure number (e.g., TrueFigure1).
12. Please include a contact email address to be published with your article.

Submission deadlines:
December 5 for January/February 2017 issue
January 5 for March/April 2017 issue
February 5 for May/June 2017 issue

***Please note new submission address:**
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Red Flags—Misleading & Inappropriate Messaging

The International Society of Hair Restoration Surgery (ISHRS) is serious about protecting the public. The ISHRS has published guidelines for its membership about *Misleading and Inappropriate Messaging* on physicians' websites and marketing materials.

The ISHRS encourages its members to only include website and marketing messaging to the public that will augment their understanding and knowledge of the causes and scientifically proven therapies for hair loss.

Guidelines have been established to help members avoid what can be universally considered as misleading or unacceptable messages.

The following are considered misleading or inappropriate. **Please note that 1a has recently been added.**

We encourage ISHRS members to review their websites and marketing materials to **ensure that these infractions are not included**. Members of the public who are seeking professional services from a hair restoration surgeon should consider these terms as "red flags." If they are used in a doctor's marketing material or website, the consumer should beware.

False Statements and Copyright Infringement

1. Including inaccurate credentials, e.g., claiming ABHRS (American Board of Hair Restoration Surgery) Diplomate status or FISHRS (Fellow of the International Society of Hair Restoration Surgery) status when the individual has not earned these designations, or claiming inaccurate expertise in hair restoration surgery
   a. Members should not mislead the public with regard to their qualifications. Reference to Board Certification should be specific to the certification that has been achieved. Those who have the passed the American or International Board of Hair Restoration Surgery examination have agreed to refer to themselves as "Diplomates" of the ABHRS or IBHRS and to not refer to themselves as Board Certified in Hair Restoration.
2. Using other physicians' before & after photos as their own
3. Violating copyright of others with photos or text
4. Using ISHRS Members Only logo inappropriately, e.g., when they are not a full Member
5. Using Fellows Only logo inappropriately, e.g., when they are not designated as a Fellow status of the ISHRS
6. Using the ISHRS logo. Note: Nobody except the ISHRS is allowed to use the official ISHRS logo.

Inappropriate Use of Staff

7. Evidence of unlicensed, non-physicians performing surgical procedures

Inappropriate, Misleading, Inaccurate Terminology

8. "Scarless surgery"
9. "No incision"
10. "No touch"
11. "No cutting"
12. "Cloning"
13. "Hair multiplication"
14. "Non-invasive"
15. "Eliminates the need for additional procedures"

True Co-editor Message *from page 243*

Walter Unger offered a comment addressing concerns about donor utilization with FUE (pronounced "eff–you–ee"). In his comment, Dr. Unger indicated that while he had serious reservations about the technique, he was also appreciative of it. But it was curious in his remarks he referred to FUE as fu-ee (pronounced "phooey"). Phooey has a meaning in English of expressing disdain or disbelief. At the time, I was curious as the to his usage, but as I have thought about it, I have begun to wonder if the unusual pronunciation was not intentional and meant to express a belief that FUE is an intrinsically flawed technique. Maybe this was not the intent, but it raised the question for me. I do know that there are some among our membership who do consider FUE to be an inherently flawed technique citing the hair transection rate and the false promise of being able to shave the head without harvesting being visible. While I understand these points, I would strongly argue that FUE is not "phooey," and that the problems associated with the technique that we are seeing manifested currently are not a consequence of inherent flaws but rather of misapplication, and particularly because of overly aggressive application of the technique. This is most evident in the performance of FUE mega sessions of 4,000 or more grafts from the scalp in a single surgery. This can only be done if the density of harvests is too high, there is a disregard for transection, and areas outside of the safe zone are harvested to the same extent as within the safe zone. We are unfortunately seeing patients (many of whom are young) who have their donor zone depleted in a single surgery while at the same time having little growth to show for the surgery, and who certainly cannot hide the donor depletion without wearing their hair long. FUE is still referred to as a "new" technique, but it has been around for 15 years. It has evolved and improved substantially during this time, and I believe right now we will see the technique becoming even better because of recent innovations. FUE does not belong in the same company as laser hair transplants and the multi-bladed knife. But in order for it to not become associated with more harm than good, it must be applied thoughtfully, conservatively, and honestly while avoiding overly aggressive use.◆

Notes from the Editor Emeritus

Dow B. Stough, MD *Hot Springs, Arkansas, USA* dbs4@cablelynx.com

Coincidental Epigenetics or Post-Finasteride Syndrome (PFS)?

The 2016 ISHRS World Congress in Las Vegas featured Dr. Alan Jacobs as guest speaker. Dr. Jacobs is a Neuroendocrinologist in private practice after a stint as Assistant Professor of Neurology at SUNY/Downstate Medical Center. In 2003, he opened his clinical practice in Behavioral Neurology, Memory Disorders and Neuroendocrinology in Manhattan. He has seen over 500 cases of persistent sexual, emotional, and cognitive impairment, some of which he directly attributes to finasteride use. It is from this extensive experience and knowledge that he presented a talk titled "Post-Finasteride Syndrome and the Neuroendocrine System."

By definition, Dr. Jacobs believes PFS is a side effect of the drug finasteride, and it is primarily a sexual impairment phenomenon. Many cases have accompanying depression and cognitive impairment occurring simultaneously. In some cases, it is not reversible and can persist long term after discontinuing the medication. Dr. Jacobs recalled his first case involving a hedge fund manager who reported experiencing a "brain fog" and sexual dysfunction very similar to drinking 3-4 glasses of wine. This brain fog had persisted for 1.5 months. The patient had been on finasteride for 10 years. He stopped the finasteride and noticed his brain fog and sexual dysfunction improved. He went back on finasteride and all of his symptoms recurred. The patient's DHT and A-DIOL glucuronide were very low. Following discontinuation of finasteride, his A-DIOL glucuronide normalized. Dr. Jacobs stated he became involved with studying this syndrome after this case and reports there may be common neuroendocrine findings in other cases. A low FH and LFH, low bioavailable testosterone, and finally the biotestosterone/estradiol testosterone is altered. He gave a lengthy expose on testosterone biotransformation and noted that testosterone itself can be reduced by 5α-reductase to 5α-dihydrotestosterone (Figure 1). It can also be reduced by 5β-reductase to 5β-dihydrotestosterone and a third pathway involves reduction by aromatase 17β-estradiol. The mechanisms of production of PFS is theory, but it appears the testicular function in these individuals is normal. He also stated the pituitary gonadotrophs function is normal in the cases he studied. The hypothalamic GnRH cells may be the area of dysfunction. This would involve the limbic HPG axis. The GnRH is released at various times in life by stimulation of various neuropeptides, one of which is a hypothalamic neuropeptide kisspeptin. Kisspeptin is a potent stimulus for GnRH secretion. Dr. Jacobs believes this may later be found to play some sort of role in PFS (Table 1).

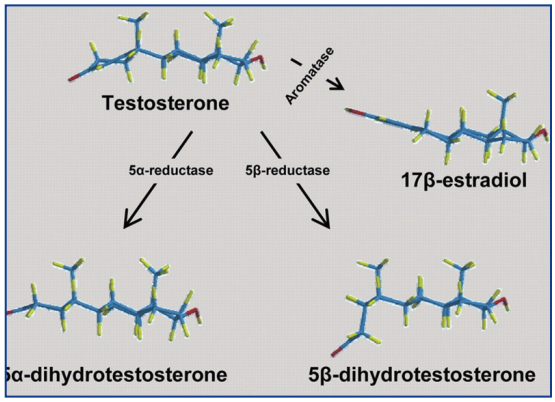

Figure 1. Testosterone biotransformation (Credit: Alan Jacobs, MD. "Post-Finasteride Syndrome and the Neuroendocrine System." Presented at the ISHRS 24th World Congress, Las Vegas, Nevada, USA. September 2016.)

Mechanisms of PFS

1. Testicular functioning is normal.
2. The pituitary gonadotrophs function normally.
3. The hypothalamic GnRH cells may be the area of dysfunction.
4. The temporal lobe limbic structures often inhibit hypothalamic GnRH function.

Table 1. Mechanisms of PFS (Credit: Alan Jacobs, MD. "Post-Finasteride Syndrome and the Neuroendocrine System." Presented at the ISHRS 24th World Congress, Las Vegas, Nevada, USA. September 2016.)

Several other potential processes were discussed, including the phenomenon of epigenetics. Specifically, there have been cases of persistent sexual dysfunction after discontinuation of SSR reuptake inhibitors that may be linked to epigenetic mechanisms. A similar occurrence has been reported with isotretinoin. Concerning genetics and finasteride, reference was given to an article that demonstrated the smaller the CAG-repeat number, the larger the improvement with finasteride. CAG counts are important in the axon 1 region of the androgen receptor gene. The CAG-repeat length of axon 1 of the androgen receptor has shown causal interactions with depression, personality traits, body composition, sex hormone levels, libido, and other findings, so it would follow that certain individuals are predisposed to react differently to finasteride depending on their genetic makeup.

A recent article posted in the Journal of Clinical Endocrinology and Metabolism showed no differences in the sequences of AR, SRD5A1 and SRD5A2 genes among symptomatic finasteride users versus asymptomatic users. Dr. Jacobs was critical of the methodology used in the genetic testing of this particular study. He reported that although the study mentioned above was sponsored by The Post Finasteride Syndrome Foundation, and was largely negative, it didn't rule out an epigenetic effect. He believes the same epigenetic effects from various drugs could cause similar symptomatology, specifically among users of antidepressants, isotretinoin, and 5α-reductase inhibitors.

Dr. Jacobs's discussion was well received by the Society, but key questions remain. Audience members voiced their concerns. Chiefly, PFS was not reported in the literature for the first 10 years the drug was on the market. Hair transplant surgeons are responsible for prescribing a large amount of this medication yet there was no mention on PFS for the first 10 years of the drug release. Why all the sudden reports? Could this drug really be responsible for the PFS or could it simply be coincidental epigenetics? In other words, would these men have suffered the same syndrome whether or not they were on drug? Does epigenetics explain this occurrence after SSRIs, 5ARs, and isotretinoin? My own take-home lesson from his talk was if a young man has any history of depression, mood swings, or sexual dysfunction, then do not prescribe finasteride for him. He may just have the wrong set of genes. The finasteride syndrome findings should still be studied along with the concept of a coincidental epigenetic phenomenon.◆

Antithrombotic Therapy *from front page*

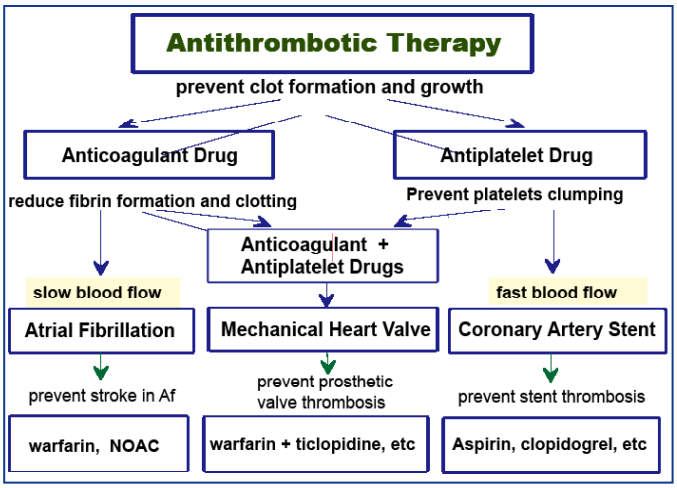

Figure 2. Antithrombotic therapy in patients with cardiovascular diseases.

have pointed out that heparin doesn't prevent platelet activation and coagulation cascade. Heparin doesn't stop the thrombotic process, even though heparin seems to prevent blood clot formation. A few years ago the American Heart Association and the American College of Cardiology Foundation (AHA/ACCF) published a guideline stating that the societies don't recommend the heparin bridging regimen anymore.[1,3-5] Several studies show that heparin doesn't prevent arterial thromboembolic events whereas heparin increases the risk of major bleeding.[2,6] There are many physicians and cardiologists who don't know the new guideline and still recommend heparin bridging for patients under antithrombotic therapy.

Safe Guide on Peri-operative Control of Warfarin

Warfarin (Coumadin) is slow-acting and has a long half-life. The half-life of warfarin is about 36 hours in the blood. The anticoagulant effect of warfarin appears in 12-24 hours and lasts for 48-72 hours. In the clinical experience, warfarin remains effective for 3-4 days after it is stopped, and it takes 4-5 days for warfarin to reach the therapeutic effect after it is restarted. The anticoagulant activity of warfarin is closely monitored by the prothrombin time/international normalized ratio (PT/INR) to ensure that an adequate and safe dose is taken.[7] The targeted PT/INR level tends to be 2.0-3.0 in most conditions as maintenance anticoagulant therapy for the prevention of thrombosis in patients with mechanical heart valves.

If the PT/INR is 2.0-3.0, the patient has a risk of bleeding but there is little risk of thrombosis.[8] This strict anticoagulation is applied to patients with a mechanical heart valve or atrial fibrillation. A PT/INR of 0.8-1.2 is normal coagulability, and there is little risk of bleeding but there is a risk of thrombosis. If the PT/INR is around 1.5-1.6, there is little risk of bleeding or thrombosis. This means low-intensity anticoagulation can be applied for less than one week to a patient with a mechanical heart valve and paroxysmal atrial fibrillation (Figure 3).

Interruption of anticoagulation before surgery can be problematic. If warfarin is stopped for longer than 4-5 days preoperatively, the PT/INR will return to normal (<1.2) on the day of the procedure, and the patient will remain unprotected for about 3-4 days post-operatively. The period off warfarin can be shortened by restarting warfarin in the maintenance dose one day before the procedure with the expectation that coagulability will become nearly normal on the day of the procedure and warfarin will become effective again soon after the surgery.

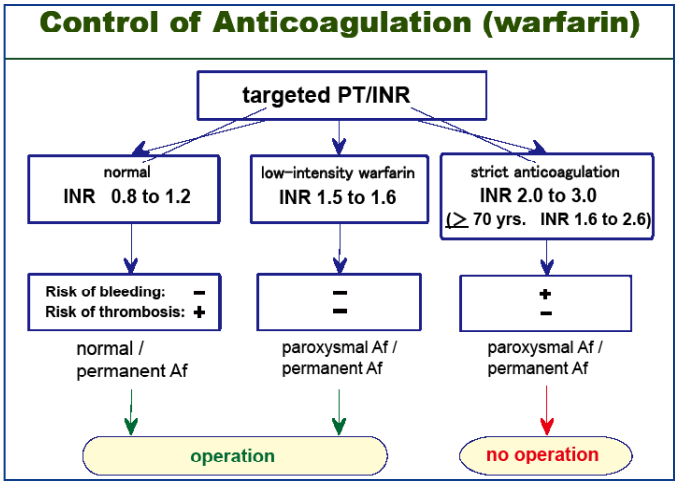

Figure 3. Control of warfarin and PT/INR before surgery.

If warfarin is stopped, there is a risk of thrombosis in patients with a mechanical heart valve. Therefore, the dose of warfarin should be reduced gradually 5-6 days before surgery. The final dose of warfarin can be reduced to two-thirds to three-fourths of the maintenance dose for 2-3 days before surgery to allow the PT/INR to fall to around 1.5-1.6 on the day of the surgery. If the PT/INR is around 1.5 on the day of the procedure, warfarin will not cause hemorrhagic tendency or thrombus formation. This low-intensity warfarin doesn't interfere with surgical procedures including abdominal surgery, orthopedic surgery, cardiac surgery, and tooth extraction. Hair transplantation can be performed without any difficulty. Further reduction of the dose of warfarin is dangerous and not necessary. Warfarin should be restarted in the maintenance dose soon after the surgery. Warfarin should not be stopped before hair transplantation in patients at high risk of thrombosis (Figure 1).

Safe Period with Low-Intensity Warfarin

At the outpatient clinic, the result of PT/INR varies often according to a patient's dietary habits. If the patient takes antiplatelet drugs, the patient is safe even if the PT/INR is kept around 1.4-1.6 for several weeks or one month. If the patient takes no antiplatelet drugs, the period of PT/INR of 1.5-1.6 should be kept short and the period off warfarin should be less than a few days.

Aortic Valve vs. Mitral Valve

As for the difference in the location of the mechanical heart valve, a prosthetic heart valve at the aortic position has less possibility to form thrombus than one at the mitral position because of high blood velocity and high driving pressure to open and close the valve. Patients after aortic valve replacement have less possibility of thrombosed valve than those after mitral valve replacement, even when they are kept under insufficient antithrombotic therapy for a few months.

Prosthetic heart valves at the tricuspid and pulmonary positions are more likely to form thrombus because of slow blood flow and low driving pressure to open and close the valve. This is the reason why mechanical heart valves are not used at the tricuspid and pulmonary position.

In addition, there is an increased risk of thrombosis of a mechanical heart valve if the patient receives poor control of antithrombotic therapy for several months.

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Antiplatelet Drugs

Patients with a mechanical heart valve need a combination of anticoagulant and antiplatelet drugs to prevent clot formation and growth.[8] Dipyridamole and ticlopidine are usually used as antiplatelet drugs for mechanical heart valves. Dipyridamole has a moderate antiplatelet effect. Ticlopidine is a relatively strong antiplatelet drug.

About 30-40 years ago, only an anticoagulant without antiplatelet drugs was prescribed for patients after valve replacement, and thrombosed mechanical heart valve was not rare in those days.

Antiplatelet drugs should only be stopped for a short period in patients with a mechanical heart valve. The length of time without antiplatelet drugs is determined by the half-life and irreversibility of the drug.[8] The half-life of dipyridamole is short and the effect is reversible, and dipyridamole can be stopped only 1-2 days before surgery. If the antiplatelet drug has a long half-life and irreversible effect, it needs to be stopped 3-7 days before surgery. Ticlopidine can be stopped 5-7 days before surgery, but not longer than one week. It is also important to restart the antiplatelet drugs in the maintenance dose on the first day following the surgery.

Aspirin is a weak antiplatelet drug, and aspirin is not enough for antithrombotic therapy in patients with a mechanical heart valve. Usually, aspirin is not used as an antiplatelet drug in patients with a mechanical heart valve. If a patient does take aspirin as an antiplatelet drug, aspirin can be continued for surgery. Low-dose aspirin doesn't cause hemorrhagic tendency during the surgery.

Patients with a Mechanical Heart Valve

Over 30 years of practice, this author has treated hundreds of patients with mechanical heart valves in an outpatient clinic. Patients with a mechanical prosthetic valve need lifelong antithrombotic therapy using a combination of warfarin and antiplatelet drugs.[8] As these patients aged, some needed various kinds of operations including major surgery such as cholecystectomy for gallstones, colectomy for colon cancer, knee joint replacement, another heart valve replacement, coronary artery bypass graft surgery, etc. Patients sometimes also needed minor surgery such as tooth extraction, cataract operation, skin cancer removal, and empyema operation in the nasal cavity. All the patients went through these procedures safely without a thrombotic event when managed as outlined above.

As for the duration of hair transplantation, there is enough time to operate on the patient as usual. It is not necessary to hurry to finish the operation. If the drugs are controlled properly before surgery, patients remain safe for several days with a reduced dose of antithrombotic drugs.

Coronary Artery Stent

Stent thrombosis is a serious complication.[9,10] Thrombus in the coronary stent occludes the lumen of the stent, which results in acute myocardial infarction. Stent thrombosis is a life-threatening complication with a high mortality rate of 20%. Antiplatelet drugs are necessary to prevent thrombus formation in coronary artery stents. Patients with coronary artery stents need long-term antiplatelet therapy (Figure 2).

Drug eluting stents are usually selected for percutaneous coronary intervention. Antithrombotic therapy for patients with drug eluting stents is as follows (Figure 4). Patients within one year after the coronary intervention using drug eluting stents need a combination of two antiplatelet drugs. This dual antiplatelet therapy (DAPT) means the combination of aspirin 81mg per day (ranging 75-100mg) and another stronger antiplatelet drug such as a P2Y12 inhibitor (clopidogrel, prasugrel, or ticagrelor). Aspirin is always continued in patients with coronary artery disease regardless of the duration of DAPT.

DAPT

DAPT is used to reduce the risks of future heart attack and coronary stent thrombosis, which means occlusion of a stent by a blood clot. In general, DAPT cannot be stopped for one year. Hair transplantation should be postponed until one year after the stenting treatment.

In patients from one to two years after stenting treatment using drug eluting stents, hair transplantation is possible. Patients usually need both aspirin and clopidogrel in this period. Clopidogrel can be stopped for 5 days as long as aspirin is continued, and safe hair transplantation is possible as usual in these patients (Figure 4). If you want to stop both drugs, you can stop them for only 3 days before surgery but not longer. After hair transplantation, however, both drugs should be restarted.

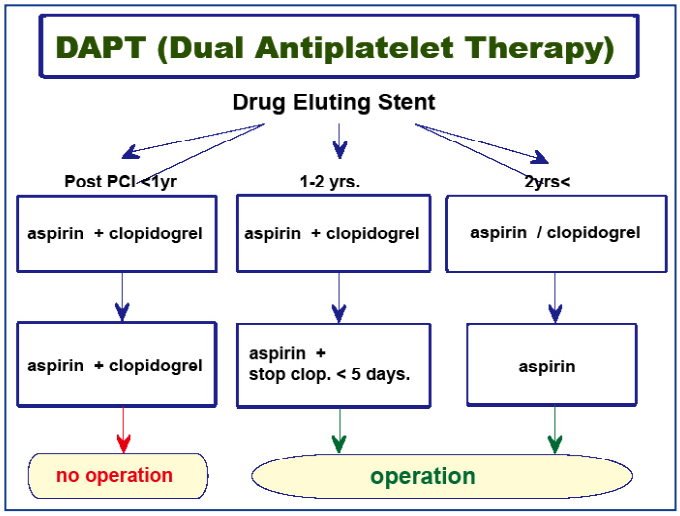

Figure 4. Control of dual antiplatelet therapy in patients with coronary artery stents.

In patients more than two years after stent implantation using a drug eluting stent, one antiplatelet drug is used in the long term. If the patient takes clopidogrel, it can be changed to aspirin for one week before surgery, and then the clopidogrel can be restarted after the hair transplantation. If the patient takes aspirin as an antiplatelet drug, it can be continued before surgery (Figure 4). Safe hair transplantation is possible as usual with a maintenance dose of aspirin. Even FUE is possible in patients with low-dose aspirin because low-dose aspirin doesn't cause hemorrhagic tendency during surgery. Aspirin should be stopped for no more than 3-5 days.

This year, the American College of Cardiology Foundation (ACCF) and the American Heart Association (AHA) released updated guidelines for dual antiplatelet therapy in patients with a coronary artery stent.[11] The new guidelines are based on the findings of recent studies in patients with a new type of stents that lowers the risk of clotting complication better than the older types of coronary stents. The updated recommendations on duration of DAPT compiled six previously published guidelines, which were published by the ACCF/AHA from 2011 to 2014. The new guidelines recommend a shorter duration of DAPT (short DAPT) in patients with a low risk of stent thrombosis and a high risk of bleeding. The guidelines also recommend a longer period of DAPT (long DAPT) in patients with a high risk of stent thrombosis and a low risk of bleeding. In general, DAPT for 6-12 months is a Class I recommendation, and DAPT for more than 12 months is a Class IIb recommendation. These recommendations apply to

a new generation of coronary stents with less possibility of stent thrombosis and to patients without oral anticoagulant therapy.

Maintenance drugs should be checked in patients with a coronary artery stent. If the patient needs antiplatelet drugs as maintenance therapy, it is important to talk to the patient's physician about these drugs. If the cardiologist doesn't mind stopping the antiplatelet drugs for several days, antiplatelet drugs can be stopped before surgery and restarted after the surgery. If the cardiologist doesn't allow the antiplatelet drugs to be stopped, the drugs should be continued before the procedure. Hair transplantation is an operation with low risk of bleeding. Safe operation is possible even in patients using low-dose antiplatelet drugs.

Risk of Cardiovascular Event

It is important to compare the risk of bleeding and the risk of thrombosis in cardiovascular patients (Figures 1 and 5). Patients with a coronary artery stent and unstable angina pectoris belong to a high-risk group. In these patients, thrombosis may cause serious cardiovascular events and acute myocardial infarction. Antithrombotic drugs should be continued in the maintenance dose or they can be reduced to two-thirds dose for only a few days before the hair transplantation. If antithrombotic drugs are stopped before surgery, the patient will be put at risk for thrombosis with high mortality.

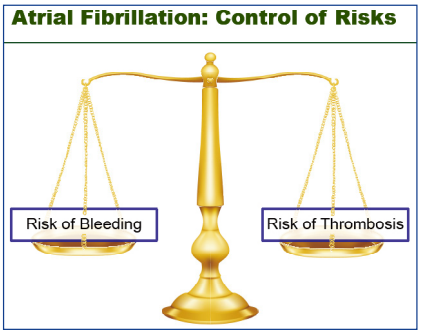

Figure 5. Risk of bleeding vs. risk of thrombosis.

If a patient needs clopidogrel as antithrombotic therapy, there are two possibilities. First, ask the cardiologist if clopidogrel can be switched to low-dose aspirin for one week. If the cardiologist agrees with low-dose aspirin, it can be continued and a safe hair transplantation without difficulty in hemostasis can be performed. Second, if the cardiologist doesn't agree with aspirin, ask if the dose of clopidogrel can be reduced to one-half to two-thirds of the maintenance dose. If the dose of clopidogrel can be reduced before surgery, the hair transplantation can be performed without major difficulty. If the cardiologist doesn't agree with dose reduction of clopidogrel, the hair transplantation should be performed carefully, or the operation postponed for one year. After one year, the cardiologist will probably agree with dose reduction or change of the drug.

Atrial Fibrillation

Loss of wall contraction and stasis of blood flow tend to cause thrombus formation in the left atrial appendage in patients with atrial fibrillation.[12-17] Thrombus in the left atrial appendage is usually large in size, and thromboembolism of the clot occludes the large artery in the cranium. Symptoms of large vessel embolic ischemic stroke include hemiplegia, speech disturbance, etc.

An anticoagulant drug prevents clot formation in the left atrium (Figures 1-3). Warfarin is used to prevent ischemic stroke in patients with atrial fibrillation. Targeted maintenance anticoagulation of warfarin is usually a PT/INR of 1.6-2.6 in patients with atrial fibrillation.

Patients with paroxysmal atrial fibrillation have a high risk of thrombosis if warfarin is discontinued; rather, warfarin should be reduced to two-thirds of the maintenance dose for 4-5 days in advance of surgery to allow the PT/INR to fall to near normal (1.4-1.6) (Figure 3). The maintenance dose of warfarin should be resumed post-operatively.

Patients with permanent atrial fibrillation have a low risk of thrombosis, and warfarin can be stopped or reduced to half of the maintenance dose for 5-7 days before surgery to allow the PT/INR to fall to normal or near normal (1.0-1.5). The maintenance dose of warfarin should be restarted after surgery.

If the PT/INR is around 1.5-1.6, there is little risk of bleeding or thrombosis. This means low-intensity anticoagulation can be safely prescribed for less than one week for patients with paroxysmal or permanent atrial fibrillation.

NOAC

Recently, several new anticoagulants (novel oral anticoagulants [NOAC]) have become commercially available. They are direct thrombin inhibitors. Their bioavailability is not affected by foods, and similar effective results are expected without blood tests. The half-life of dabigatran is 12-14 hours, the half-life of apixaban is 9-14 hours, rivaroxaban 7-11 hours, and edoxaban 9-11 hours. Dabigatran is a direct thrombin inhibitor. Apixaban, rivaroxaban, and edoxaban are selective direct inhibitors of clotting factor Xa. The dosage of NOAC is reduced to two-thirds or one-half per day to avoid bleeding complication in patients over 70-80 years of age or in patients with moderately impaired renal function. If NOAC is stopped for 24 hours before surgery, coagulability will return to nearly normal on the day of the procedure. Major surgery is possible if NOAC is stopped for 2 days before surgery.

NOAC is usually recommended as antithrombotic therapy in patients with atrial fibrillation. NOAC reduces the risks of stroke, systemic thromboembolism, and major bleeding in comparison with warfarin. However, if a major bleeding complication happens, the patient's condition may become serious and sometimes be fatal. There are several recent reports on fatal intracranial bleeding in elderly patients under antithrombotic therapy using NOAC. There is no laboratory measure for the effect of NOAC, or to determine when NOAC is overdosed. Currently, there is also no drug to counteract the effect of NOAC when the patient has bleeding complications. Therefore, NOAC should be used carefully and only by experienced cardiologists.

Risk of Bleeding vs. Risk of Thrombosis

It is important to compare the risk of bleeding and the risk of thrombotic events in patients under antithrombotic therapy (Figure 5). Diseases that require lifelong antithrombotic therapy are classified into either 1) a low-risk group or 2) a high-risk group (Figure 1).

Disorders in the high-risk group include unstable angina pectoris, recent cerebral infarction, paroxysmal atrial fibrillation, and patients with mechanical prosthetic heart valve and coronary artery stents. Thrombosis may cause serious cardiovascular events in these patients, and antithrombotic drugs should not be stopped before hair transplantation.

Disorders in the low-risk group include old myocardial infarction, old cerebral infarction, permanent atrial fibrillation, bioprosthetic heart valve, deep vein thrombosis, and pulmonary embolism. Thrombosis does not directly cause serious cardiovascular events in these patients, and antithrombotic drugs can be stopped only for a short period before surgery.

Antithrombotic Therapy

Antithrombotic therapy consists of anticoagulant and antiplatelet drugs (Figure 2). Anticoagulant drugs reduce fibrin formation

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and slow down clotting. Antiplatelet drugs prevent platelets aggregation. A combination of anticoagulant and antiplatelet drugs is important to prevent clot formation and growth.

An anticoagulant drug prevents thrombus formation in slow blood flow, where an antiplatelet drug has little effect. An anticoagulant is effective to prevent thrombus formation in the left atrial appendage in atrial fibrillation, deep vein thrombosis, venous thromboembolism, etc.

An antiplatelet drug prevents thrombus in the arterial circulation with fast blood flow, where an anticoagulant is not effective. Antiplatelet drugs prevent thrombosis in the coronary artery stent, and in many cerebrovascular and cardiovascular diseases.

Patients with a mechanical heart valve need both anticoagulant and antiplatelet drugs to prevent thrombosis. Only an anticoagulant drug or only an antiplatelet drug is not enough to prevent thrombosis on the mechanical heart valve.

Other Issues in Cardiovascular Patients

There are other considerations for safe surgery in elderly patients and patients with cardiovascular diseases.

Beta Blocker

Patients with cardiovascular diseases sometimes need a beta blocker as one of maintenance drugs for the treatment of hypertension, heart failure, and tachyarrhythmia.[18,19] Usually, a beta-1 selective blocker such as bisoprolol, atenolol, or metoprolol is used (Table 1). A beta blocker works effectively to control hypertension and tachyarrhythmia including paroxysmal atrial fibrillation. If a patient takes a beta blocker for cardiovascular diseases, it is not a good idea to stop the beta blocker before hair transplantation. If a beta blocker is stopped before surgery, there is the possibility that the patient will have uncontrollable hypertension or dangerous tachyarrhythmia during surgery.

There is a guideline on peri-operative usage of beta blockers published by the American Heart Association/American College of Cardiology Foundation (AHA/ACCF) that recommends continuation of a beta blocker before non-cardiac vascular surgery. If the patient needs a beta blocker for the treatment of tachyarrhythmia, hypertension, and other cardiovascular diseases, a maintenance dose of beta blocker should not be stopped before surgery. Peri-operative beta blockade in cardiovascular patients is a Class I indication on the level of evidence B or C in the ACCF/AHA guidelines. Safe operation is possible as usual even when a small dose of epinephrine is added in the tumescent solution. A beta-1 selective blocker reduces peri-operative mortality and non-fatal heart attacks in patients undergoing non-cardiac vascular surgery. A beta blocker should be continued before hair transplantation in patients with cardiovascular diseases.

Beta Blocker

		ISA	MSA	agents
I	Non-selective	+	+	alprenolol, penbutolol, oxprenolol, penbutolol
		+	-	pindolol, carteolol
		-	+	propranolol, bufetolol
		-	-	timolol, nadolol, nipradilol, tilisolol
II	β1-selective	+	+	acebutolol
		+	-	celiprolol
		-	-	metoprolol, atenolol, bisoprolol, betaxolol
III	α-blocking	+	+	labetalol
		-	+	carvedilol
		-	-	arotinolol, amosulalol

ISA: Intrinsic Sympathomimetic Activity,
MSA; Membrane Stabilizing Activity

Table 1. Beta Blocker

Epinephrine

This author usually dilutes epinephrine in the concentration of 1:500,000 to 1:1,000,000 in the tumescence. The concentration is enough for vasoconstriction and hemostasis. The author prefers intradermal injection of tumescent solution all around the recipient area and the donor area. Most of the blood flow comes through the dermal layer, and there is little blood supply from the subcutaneous adipose tissue. This author usually has difficulty finding slits in the recipient area, because only a little bleeding can be seen during surgery. Over the past 10 years, this author has never used "super juice" with high epinephrine concentration during surgery.

Hair transplant surgeons are sometimes afraid of bleeding from slits, and they want to stop antiplatelet drugs and anticoagulants before surgery. However, bleeding from slits and antithrombotic drugs are different issues. Bleeding from slits can be reduced by intradermal injection of tumescent solution containing a small dose of epinephrine all around the recipient area. If bleeding from a slit is caused by injury of an intradermal vessel, an additional intradermal injection of tumescent solution at the site of bleeding can be given. Increased tissue pressure minimizes bleeding from the slit; gauze can be used to compress the slit for a few minutes while making slits in other places in the recipient area. Subcutaneous injection of super juice has little effect on bleeding from slits.

Others

In at-risk patients, electrocardiogram, blood pressure, heart rate, and peripheral oxygen saturation (SpO_2) should be monitored throughout surgery.

This author always uses nitroglycerin (NTG) tape in patients with ischemic heart disease or patients older than 60 years of age. A half size of 5mg NTG tape is put on the anterior chest wall of the patient 15-20 minutes before surgery. It will keep a stable subtherapeutic concentration of NTG in the blood during surgery, which will make the operation safer. When the tape is removed, the effect of NTG will disappear. Usage of a small dose of NTG has no side effect.

Sedative drugs will be helpful to reduce anxiety and sympathetic nerve activity in patients with ischemic heart disease and tachyarrhythmia. Painkillers also can be helpful during operation. The author prefers fentanyl tape to reduce pain during and after surgery. A half size of 1mg fentanyl tape works satisfactorily.

Nasal oxygen 1.5-2L/min should be prepared to avoid hypoxemia during surgery. It is safer to keep SpO_2 of 96-98% or greater during surgery.

An intravenous cannula should be inserted before surgery in cardiovascular patients And an anesthesiologist should be there to help during the surgery. In addition, 500-1,500cc Lactated Ringer's solution should be prepared for volume replacement in case of hypotension and hypovolemia. Drinking isotonic sports drinks is also useful as volume replacement before surgery.

Hypotension should be avoided during surgery in patients with ischemic heart disease.[20] If the systolic arterial pressure drops to less than 90mmHg during surgery, the patient's lower legs should be raised and the patient should be put in Trendelenburg position. If the systolic arterial pressure drops below 80mmHg, the patient

with ischemic heart disease will be at risk of cardiac arrest and should be given transfusion and vasopressor. The author gives the patient rapid transfusion of 1,000-1,500cc Lactated Ringer's solution and an intravenous injection of ephedrine. Ephedrine is effective to treat low arterial pressure during surgery. Intravenous injection of 4-6mg ephedrine can be repeated every several minutes up to 2-3 times. After an injection of a total of 12-16mg ephedrine, the systolic arterial pressure should become greater than 90-100mmHg again, and the operation can be restarted. Ephedrine is a safe and effective vasopressor to treat low systolic arterial pressure during surgery.

Conclusion

Over a 10-year period, the author has performed 48 hair transplantation surgeries in 26 male patients with cardiovascular and cerebrovascular diseases. Patients needed maintenance antithrombotic therapy in 26 operations. They included ischemic heart disease in 11, ischemic cerebral disease in 8, atrial fibrillation in 4, prosthetic heart valve in 2, and pulmonary embolism in 1. All these patients underwent safe surgery without complications. The author always continued beta blocker, anticoagulant, and antiplatelet drugs before surgery, which made the hair transplantation safer.

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Excerpt from Dr. Kuniyoshi Yagyu's Opening Remarks from the 24th ISHRS World Congress

President Kuniyoshi Yagyu addressing the Congress.

The ISHRS is against misleading advertisements. False advertisement should not be made by the ISHRS members. The words "No Scar" in the donor area and "No Pain" procedure should not be used in the advertisement or on the website. Medical advertising must adhere to the truth. Physicians are required to adhere to high ethical standards, because you are proud members of the ISHRS.

The ISHRS is a society where surgeons perform the surgery. The ISHRS is not a society where non-licensed technicians perform surgery. Qualified physicians make all surgical incisions of FUE and FUT. All decisions during the surgery should be made by physicians. Hair transplantation procedure should be performed by physicians. A non-licensed person is not allowed to perform hair transplantation surgery.

Hair restoration is usually a safe procedure. However, problematic situations do develop from time-to-time. Sometimes a fatal complication has been reported even in young patients. Problematic situations may be encountered during surgery. We should always be prepared for possible complications.

The simple rule of doing no harm is not enough. We should always try to do the right thing for the patient. The patient must be served well.

The ISHRS is strongly against the paradigm that allows technicians to perform hair transplantation surgery. The Society has been struggling to achieve this hard task for many years. We had many difficulties in attaining our objective. Recently, we took a step forward in some countries and states. There are still many difficulties in the legislative lobbying efforts but we keep our energy and passion to move forward to protect our patients. Patients' safety is upmost importance for the Society. The ISHRS is the society where physicians perform the surgery. We are against a non-licensed practice of medicine.

I trust you. I trust our members. We unite everybody, which gives us the power. We leave no one behind. This is the direction for our Society.

Ladies and gentlemen, members of the Society, today, if you have the same thoughts that I do, if you have the same hope that I do, if you have the same energy that I do, if you feel the same urgency that I do, if you feel the same passion that I do, if we do what we must do, then I have no doubt that all the patients in the world, from east to west, from south to north, will be happy.

Patients will enjoy safe surgery with ethics. We promote science in the hair restoration surgery. All physicians unite once again under the flag of the ISHRS. And the ISHRS will achieve the mission.

After the long hard days, a bright day will come.◆

ISHRS Legal Update: Delegation of Surgery in Hair Transplantation

The ISHRS shares, from time to time, legal developments on issues potentially affecting members. One such issue is the permissibility of delegating portions of hair restoration procedures to unlicensed personnel. In the United States, a physician's authority to delegate to unlicensed personnel varies from state to state, and depends on each state's regulatory scheme. Many states prohibit the delegation of surgery or medical tasks to unlicensed personnel.

The Florida Board of Medicine issued a Declaratory Statement in June 2016 that states that, "surgical excisions and incisions related to the transplantation of skin grafts goes well beyond the assisting of physicians." The Florida Board of Medicine further explained Section 458.3485, Florida Statutes, did not authorize the petitioning physician:

> to delegate the task of harvesting follicular units consisting of the excision of skin, subcutaneous tissue and hair follicles by use of a scalpel, micro-punch, motorized surgical extraction device or similar surgical instrument or device and incising the scalp for transplanting such grafts, to a medical assistant, or any other person who is not licensed as a health care practitioner and appropriately trained or otherwise experienced in the performance of such surgical procedures, in an office setting.

The Florida Board of Medicine's Declaratory Statement is consistent with Resolution 16-130 adopted by the Florida Medical Association ("FMA") in 2016. In particular, the resolution provided:

> RESOLVED, [t]hat the Florida Medical Association oppose the use of unlicensed personnel and/or medical assistants to perform critical-to-quality steps of hair restoration surgery, such as redistribution planning, donor harvesting of follicular units via FUE or strip methods, and creation of recipient sites; and be it further
>
> RESOLVED, [t]hat the FMA oppose the use of unlicensed personnel and/or medical assistants to perform the diagnosis or treatment of hair loss conditions; and be it further
>
> RESOLVED, [t]hat the FMA support legislative efforts to prohibit the use of unlicensed personnel and/or medical assistants to perform hair restoration evaluation, diagnosis, and/or critical-to-quality steps of hair restoration surgery, such as diagnosis of hair loss etiology, hair re-distribution, planning, donor harvesting of follicular units via FUE or strip methods, and creation of recipient site.

An earlier decision by the Virginia Board of Medicine is also consistent with the Florida Board of Medicine's Declaratory Statement and the Florida Medical Association's recent resolution. In 2011, the Virginia Board of Medicine instituted disciplinary proceedings against a physician who permitted unlicensed individuals to regularly incise the scalp and insert hair grafts without direct supervision, which the Virginia Board of Medicine concluded in December 2011, violated 18 VAC 85-20-29.A(1), a regulation that prohibits knowingly allowing subordinates to provide patient care outside of the subordinate's scope of practice or area of responsibility.

The prohibition on the delegation expressed by the Florida Board of Medicine and the Virginia Board of Medicine are consistent with the ISHRS's position on delegation announced in the ISHRS Position Statement on Qualifications for Scalp Surgery, available at http://www.ishrs.org/content/qualifications-scalp-surgery. These procedures should only be performed by a properly trained and licensed physician, or in countries where allowed, a licensed allied health professional within the scope of his or her license.

In addition to the foregoing examples from the United States, there are also recent international examples of charges being leveled against non-doctors performing hair restoration surgery. In September 2016, the Istanbul Attorney General's Office charged two individuals with treating patients without a diploma following a police raid that allegedly revealed them performing hair transplant surgeries at a clinic without a doctor being present. As of this writing, the case against these two individuals is pending, and the Attorney General's Office has requested prison sentences of 2-5 years.

The foregoing examples reinforce the importance of physicians, allied health professionals, and unlicensed persons involved in hair restoration to understand the legal restrictions on delegation in the jurisdictions in which they practice. Physicians, allied health professionals, and unlicensed persons involved in hair restoration surgery should carefully consider a number of factors in deciding whether delegation of a hair restoration surgery task is legal, ethical, consistent with the standard of care, and in the patient's best interests, including, whether:

(i) The delegation is legally permissible, consistent with the applicable standard of care, and consistent with the codes of ethics to which the physician or allied health professional is bound;

(ii) The unlicensed personnel has adequate education, training, and experience to perform the delegated tasks;

(iii) The level of supervision a physician must provide to the individual to whom the task is delegated (e.g., direct, in the same facility, available by phone, none) is being met;

(iv) Malpractice insurance covers the physician and unlicensed personnel;

(v) The patient provides informed consent for the procedure, including the delegated portion of the hair transplant surgery; and

(vi) Delegation of a portion of the hair transplant surgery is in the patient's best interest.

In summary, when deciding whether the delegation of medical tasks associated with hair restoration surgery is legal, ethical, and in the patient's best interests the physician and other individuals involved need to research and consider a number of factors. Relying on what others do or the assurances of a sales representative puts all those involved, including the patient, at risk. Accordingly, the ISHRS encourages physicians, allied health professionals, and unlicensed persons involved in hair restoration surgery to research and understand the legal restrictions on delegation in the jurisdictions in which they practice.

The International Society of Hair Restoration Surgery ("ISHRS") is a nonprofit corporation, exempt from federal income tax pursuant to Internal Revenue Code Section 501(c)(3), whose purpose includes educating physicians and their assistants regarding hair restoration techniques, procedures, and related issues, as well as encouraging and facilitating the free exchange of ideas, knowledge, and experience among physicians and assistants providing hair restoration.◆

Another Way to Look at Donor Harvesting Effects with FUE

Paul T. Rose, MD, JD, FISHRS *Coral Gables, Florida USA* paultrose@yahoo.com

An important consideration of the FUE process is assessing the amount of wounding that can be done to the donor area and the number of grafts that can be removed before density diminishes to a point where evidence of the procedure is apparent.[1]

Many FUE surgeons suggest that 40-50% of the donor area follicular units (FUs) can be taken before there is a significant change in apparent density. The author differs with this calculation and seeks to demonstrate an important way to look at the potential wounding and thinning to the donor area with FUE.

When a physician examines densitometry photographs from the donor area, centrally and laterally he or she can observe that taking 1 FU with the intention of leaving adjacent FUs unharvested, leaves approximately 6 or 7 FUs surrounding the FU originally taken (Figure 1). This means, ideally, that the physician would want to leave the other adjacent FUs unharvested to be able to avoid a 2 FU void. These numbers can certainly vary. It may be 1 out of 6 or 1 out of 8 in a "virgin" scalp, but review of numerous density images suggest that 1 out of 7 is most common with a density of 70-80 FUs/cm^2. From a mathematical perspective, this means that approximately 14% of the FUs can be obtained without an adjacent FU being harvested.

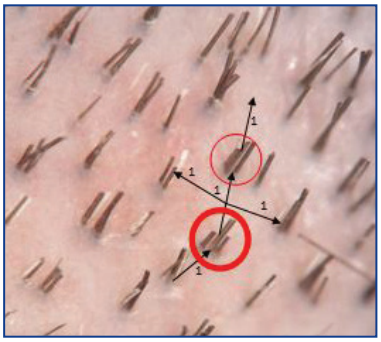

Figure 1. In planning to remove an FU, it is important to note that each FU is usually surrounded by another adjacent 6-7 FUs. Extraction of more than about 1 out of 7 of the FUs makes it difficult to avoid taking adjacent FUs in large sessions. Also note inter-follicular distances.

Why is this so important? If you assume that the safe donor area is between approximately 160-200cm^2 based on the calculations of Unger[2,3] and then Cole,[3,4] respectively, this means that a person with an average FU density of 80 FUs/cm^2 would have available 13,000-16,000 total FUs. Of that, 14% would be 1,800-2,200 grafts without needing to harvest an adjacent graft.

If a subsequent session is undertaken, the surgeon would have significantly fewer grafts to choose from and there would be marked difficulty trying to find a location where adjacent FUs were not harvested. If adjacent FUs are harvested, then often a space of at least 6mm^2 would be evident (Figure 2). This assumes an interfollicular distance of usually 1mm. Taking an FU with a 1mm punch usually produces a 1mm or more diameter wound. As the FU is surrounded by two adjacent FUs, that leaves at least 3mm of alopecic skin in one direction and often times more than 2mm in width in the other direction. This is in part due to the fact that FUE scars can heal larger than the original punch.

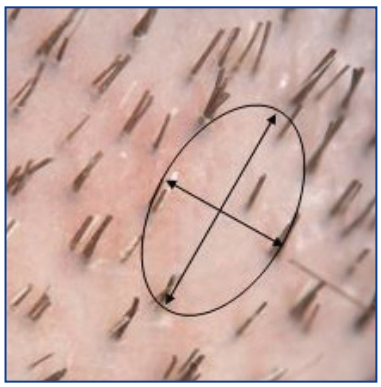

Figure 2. Removal of two adjacent FUs (compare to Figure 1) creates an area of hairless skin that can often be 6mm^2 or more. Such areas would likely be easily visible if the patient shaves his head. This measurement assumes an inter-follicular distance of approximately 1mm.

Even if a small punch of perhaps 0.7mm is used, this can create a smaller initial wound but the area left behind from the punch still can leave a substantial area of alopecic skin. Again, it is important to note that FUE wounds can heal with a wound size in excess of the initial punch.

The increase in wound size may be due to the fact that with numerous punches the usual contraction that would occur with second intention healing is reduced due to changes in contractile forces dispersed over a large area. Also, at times the approach in aligning the punch may involve an attack angle that produces an oval shape as the inferior aspect of the punch touches the skin before the superior aspect. Sometimes this occurs as the surgeon tries to adjust for the angle change of the hair as it exits the skin as opposed to the angle of the hair within the skin.[5,6] Exerting traction on the skin in an effort to straighten the hairs of the FUs while harvesting can also create an oval defect with a round punch, as a longer axis is created vertically. The oval produced is larger than the circle that would be formed by a perpendicular insertion of the punch. Consider that area of a circle is equal πr^2 (1mm punch .785mm^2) versus an oval pi multiplied by length × width/4. (1.2 (due to traction) × 1.0 × 3.14/4 = .942mm^2).

If a major aspect of the fervor for FUE is that the patient can wear his or hair quite short without evidence of the surgical procedure, then it seems that having areas of alopecic skin of 6mm^2 or more throughout the scalp would be counter to this supposed value of FUE. In view of the fact that surgeons are reporting performing cases of 5,000 or more grafts with FUE in the scalp, it seems obvious that many patients would lose a supposedly crucial benefit of the FUE process. In taking such large total amounts of FUs, these surgeons must be creating numerous areas of bald skin exceeding 6mm^2. A patient could hardly wear a short crew cut with such wounding. This is without considering that the physician must go beyond the "safe area" to achieve such numbers of grafts.

Also, the physician must be cognizant that patients with finer hair, low-hair density, and a lack of 3- and 4-hair FUs are at significant risk to have an appearance of thinning hair. Furthermore, the aging process can produce smaller caliber hairs with time and hairs within a follicular unit can be lost. This may further impact the perception of hair density in the scalp.

The figure of 40-50% has been mentioned as a percentage of hair that can be removed from an area before thinning is perceived. This seems to be an inappropriate use of the work of Dr. Emanual Marritt and not relevant to FUE surgery. While Marritt did report this percentage number, his work was based on plucking individual hairs not on taking follicular units. His work was also done with long hair not short hair.[7]

A physician might ameliorate some of the situation of prominent wounds by using partial FU removal, a technique that Cole and Rose referred to as Follicular Isolation Technique (FIT).[8] Lorenzo also has been a proponent of a method that takes partial FUs. The use of scalp micro-pigmentation could also be used to camouflage the donor area.[9] Devices to try to decrease the eventual wound size may also be helpful.[10]

It is this author's opinion that, while FUE has significant attributes, the effects of thinning and wound scar creation should be adequately discussed with the patient before endeavoring to perform the procedure. The surgeon must be aware of the limitations of the technique and the limitations of donor supply to optimize the patient's results and satisfaction with the hair restoration process.

Editor's note: Dr. Rose makes very valuable points in this paper about the limits of donor harvesting with FUE. As I have thought about this same issue, I believe we need to think of applying the "illusion of density" principle that is widely used in describing how much hair must be transplanted into an area of bald skin to reach the point that the hair does not appear to be thinning. This threshold is often cited as the need to restore 50% or more of original density. Hair caliber, texture, skin/hair color contrast, and average hairs per FU and in particular hair length have a significant impact on whether the 50% threshold does in fact create the illusion of density. When patients shave their transplanted recipient area rarely does the transplanted area appear to be as dense as the adjacent/non-transplanted scalp. The hair has to be worn longer for the difference in density to not be apparent.

The same is true when we apply this principle to FUE harvesting. With low levels of harvesting with punches 0.8-0.9mm, many patients can shave their donor areas without the harvesting being evident. But as more and more grafts are harvested, a point will be reached that the patient must no longer shave the head if they wish the harvesting to not be apparent to others. They have to start wearing their donor area hair longer. For some, 2-3mm may be all that is needed, but for others, 1cm or more will be needed. The longer hair will be necessary to have the "illusion of density" in the donor region. This is exactly what I explain to patients in giving informed consent for FUE. When they ask how many grafts can be extracted before they reach this threshold, I tell them it will vary from patient to patient because of variations in hair texture and caliber, skin to hair color contrast, donor density and average hairs per FU, and the healing of the extraction sites. Some patients may reach this threshold at 3,000-4000 grafts, others may go 1,000-2000 extractions higher before shaving the donor area is no longer possible without revealing evidence of surgery. I think the biggest problems happen with these mega-sessions of 4,000+ extractions in an initial session. Even though their surgeon very well may not have advised them of such, many of these patients will have already reached the point of needing to wear their donor hair longer in a single step. —RT

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A Side-by-Side Study of 20 Consecutive FUE Patients Comparing the Use of a 0.9mm Sharp vs. 0.9mm Blunt Punch

David Josephitis, DO, FISHRS, Ron Shapiro, MD, FISHRS *Minneapolis, Minnesota, USA* drjosephitis@shapiromedical.com

Introduction

Follicular unit extraction (FUE) has come a long way over the past 15 years. While there is still controversy surrounding when it is best to use FUE, FUT, or a combination of both, there is no question that FUE is an excellent alternative for many situations. Much of this gained acceptance is due to improvements and modifications of the FUE technique that have been associated with improved graft quality and yield. There are now many variations of techniques that exist. Still, though, there is much needed research comparing the clinical significance of some of these different techniques.

There are many different types of FUE devices spanning from manual to motorized to robotic. Within these devices, there are various types of punch tip movements from rotational to oscillatory. It is challenging to find a practical way to study and compare all of these variables. One factor that is common to all of these devices, though, is that the punch used can be either sharp or blunt. The relative benefits of a sharp versus blunt punch have been the subject of much controversy. In this study, sharp and blunt punches are compared with respect to the following parameters: 1) hair transection rate, 2) hairs per graft, 3) yield/missing grafts, 4) speed, 5) graft quality, and 6) scarring.

Study Design

Twenty consecutive patients undergoing FUE were enrolled in the study. They were all male and had never before had a hair transplant procedure. The recipient area planning was done as usual and the donor area was prepped by shaving. A vertical line was drawn in the midline of the patient's donor region extending from the superior border of the "safe" donor area to the most inferior border. A horizontal line was drawn along the superior region of the safe zone, perpendicular to the top of the first line. Two more lines were drawn parallel to the first midline demarcation 3cm in width. This created two equal boxes 3cm in width on both sides of the midline (Figure 1). A tattoo was placed in the center of each box and pre-study standard and macro photographs were taken of the donor area.

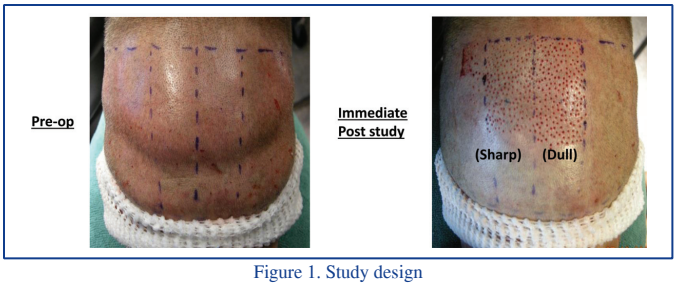

Figure 1. Study design

In all cases, the same physician experienced in both techniques performed 200 FUE extractions in each box at an extraction density of approximately 18 FU/cm^2. A 0.9mm Cole Instruments Serrounded Punch was used on the patient's left side and a 0.9mm Harris SAFE System blunt punch was used on the patient's right side. The total time for extractions was recorded for both boxes. The time for scoring the graft (punching) and extracting the graft (pulling) were recorded separately. During extraction, the number of capped grafts was also documented. A "dedicated" technician recorded the number of each type of graft (1's, 2's, 3's, etc.) along with noting any transections. ALL transections, no matter how small, were recorded, and no trimming of grafts was done at this point. Macro photographs were taken of the grafts after they were extracted. Only after all the data was collected were the grafts passed on to the other technicians to be further processed in the normal manner. All calculations were performed on the collected data at the end of the day of surgery.

There were 5 patients who were able to return for follow-up photos of their donor area between 5 and 10 months after surgery. Standard and macro photography of their shaved donor area at the sites of the tattoos were repeated in order to assess differences in scarring between the two types of punches.

Results

Hair Transection Rate (Transected Hairs/Total Hairs)

The data indicated that there was a greater percentage of transection with the sharp punch compared to the blunt punch (23.6% sharp vs. 9.7% blunt) (Figure 2). In order to better understand the significance of the transection that was occurring, in 5 patients an extra step was taken to record the percentage of transection that occurred at various levels along the hair shaft. Six different types (levels) of transection were seen (Figure 3). Of the transections, 22%-36% were Type 6, which was only a tiny spicule at the upper portion of the dermis. Although it was recorded, most physicians would likely agree that this type of transection is probably not clinically significant as greater than two-thirds of the hair was left *in vivo* and would most likely regrow. However, about 60% of the transections were a Type 4 or 5 with the transection being somewhere near the bulge or center of the shaft. The fates of these transections are more controversial and may indeed be significant.[1,2]

Transection Rate

	Sharp	Blunt
Hair transection rate (all types)	23.6%	9.7%
Hair transection rate (excluding "insignificant" transections)	20.4%	6.1%

Figure 2. Sharp vs. blunt punch transection rates

If the transection rate is adjusted to exclude the Type 6 (probably insignificant) transections, the hair transection rate decreases slightly for both the sharp and blunt punches. (20.4% sharp vs. 6.1% blunt). The sharp punch remained having a greater number of transections (Figure 2).

Hairs per Graft

The findings show that both the sharp and the blunt punch produced almost identical hairs/graft rates (2.5 hairs/graft sharp vs. 2.6 hairs/graft blunt) (Figure 4). Initially, there was doubt cast on the accuracy and reliability of these rates as the transection rates had already been found to be different. Under closer scrutiny, the numbers revealed the answer. When originally calculating hairs/graft, equal weight was given to ALL of the

hairs in each graft. There was no distinguishing between the transected and non-transected hairs within each graft. For example, a graft with 3 hairs in it would be recorded as a 3-hair graft no matter if 1, 2, or all 3 of the hairs in that graft were transected. This is an important point, because it has been increasingly suggested by some FUE physicians that the only parameter physicians need to look at to evaluate the overall success of their FUE extractions is the hairs/graft parameter, and that the hair transection rate is not as important. With the current body of knowledge, this is a premature and dangerous assumption. While it is true that transected hair has the potential to grow back, many studies have shown varying degrees of decreased survival with transected hairs. The survival seems to be related to the level on the graft at which the transection occurs.[1,2]

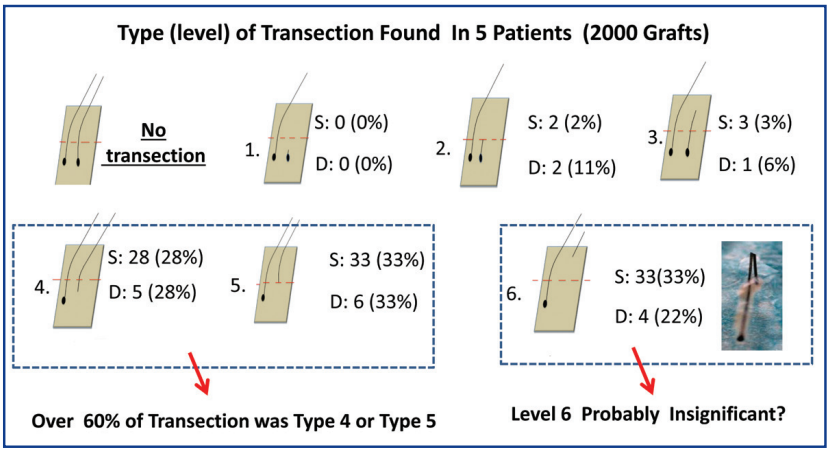

Figure 3. Levels of transection

An attempt was made to find a mechanism to take these transected hairs into consideration, but not to give them the full value of a non-transected hair. To do this, a "decreased survival" factor was arbitrarily assigned of 0.5 (50%) to the transected hairs to create an "adjusted" hairs/graft parameter. After taking this into account, the adjusted hairs/graft decreased to 1.9 for the sharp punch and 2.2 for the blunt punch (Figure 4).

Hairs per Graft

	Sharp	Blunt
Hairs / graft	2.6	2.5
Hairs / graft *(Adjusted for transection using a factor of 0.5)	1.9	2.2

Figure 4. Adjusted hairs per graft

Yield/Missing Grafts

Yield and missing grafts are two ways of looking at the same thing. Yield is the percent of extraction attempts that produce a graft. Missing grafts are the percent of extraction attempts that do not produce a graft. Missing grafts are most commonly felt to be due to a combination of capped and buried grafts, although there may be other unknown explanations.

Within the field of FUE, the issue of yield and missing grafts is most commonly discussed when referring to robotic graft extraction, because all attempts are counted during every procedure. In addition, physicians are charged for harvest attempts and not for the number of grafts they obtain, so it is an important financial issue for them. It has been less common to discuss yield and missing grafts in manual or motorized FUE for the simple reason that extraction attempts are not typically recorded. Because the design of this study consisted of doing exactly 200 attempts for both the sharp and dull, it was possible to measure the yield and missing grafts. It was determined that sharp had an overall slightly better yield than blunt (Figure 5). Out of 200 attempts, the sharp punch had a 93% yield (7% missing grafts), while the blunt punch had an 87% yield (13% missing grafts).

Surprisingly, the number of missing grafts due to capping was identical between the two punches at 5%. Initially, it was assumed that the sharp punch would have had a higher rate of capping because intrinsically the depth of a sharp punch is typically more limited than a blunt punch. After eliminating the number of capped grafts from the equation, it was shown that the blunt punch still had a higher number of missing grafts at 8% vs. 2% for the sharp. These missing grafts were assumed to have been buried grafts.

Yield

	Sharp	Blunt
Yield (out of 200 attempts)	93%	87%
Capped grafts	5%	5%
Yield (after taking into account capping)	**98%**	**92%**
Missing grafts (buried, unknown)	2%	8%

Figure 5. Sharp vs. blunt punch yield rates

Speed

Many practitioners believe that the sharp punch has a slight speed of extraction advantage over the blunt punch. The data actually revealed that both techniques were similar in speed (Figure 6). The total time was divided into two steps: punching and pulling. With the sharp punch, the punching step was faster, while the pulling phase was slower. With the blunt punch, the opposite was noted with the punching phase being slower, while the pulling phase was faster. Overall, the total time was the same, and there was no benefit of one technique over the other with respect to speed.

Speed of Extraction

	Sharp	Blunt
Punch time (minutes)	9.4	11.1
Pull time (minutes)	12.9	11.2
Extraction - total time (minutes)	22 (537 grafts/hr)	22 (540 grafts/hr)

Figure 6. Sharp vs. blunt punch speed of extraction rates

Graft Quality

Grafts from all patients were photographed and compared. In the majority of cases, slight differences were observed (Figure 7). The blunt grafts had slightly more tissue surrounding the follicles, and there appeared to be less of a separation or splaying of the follicles in the lower portions of the grafts. This may be significant as FUT studies have shown an improvement in the overall survival of grafts containing relatively more surrounding tissues.[4,5] These benefits may be due to reducing the chances of dehydration and trauma, although the actual clinical significance of these differences in FUE grafts is unknown.

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Sharp vs. Blunt Punch *from page 257*

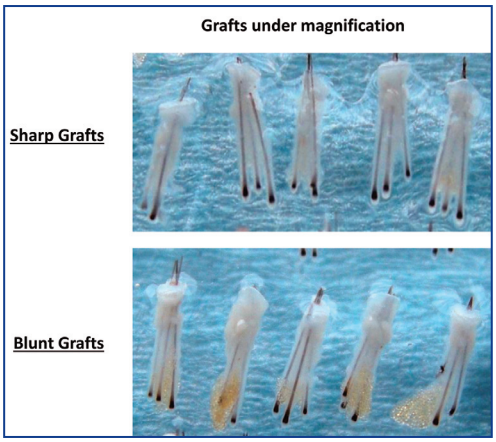

Figure 7. Grafts under magnification

Scarring

The gross photographic views showed little difference between the sharp and blunt sides (Figure 8). No scarring was detectable on either side at a #1 clipper guard haircut. When no guard was used, the small white dots typical of FUE extraction were visible but maintained an even and similar looking distribution on both sides.

At higher magnification, a subtle difference between the two sides was seen in some of the patients. The blunt side seemed to have a slightly patchier appearance compared to the sharp punch (Figure 9). A potential reason for this difference may be that the grafts on the blunt side had less transection and were more completely extracted. On the other hand, the grafts on the sharp side may have left behind some transected hairs that regrew and camouflaged the extraction site. This is a potential paradoxical benefit of some degree of extraction. It is also the reason for selective graft section in donor harvesting where there is an attempt to leave a hair or two behind when extracting larger groupings of hair.

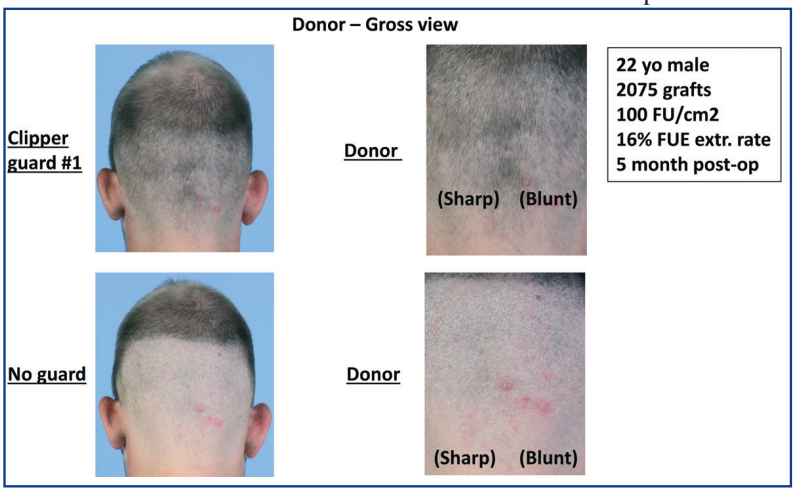

Figure 8. Graphic views showing little difference between the sharp and blunt sides.

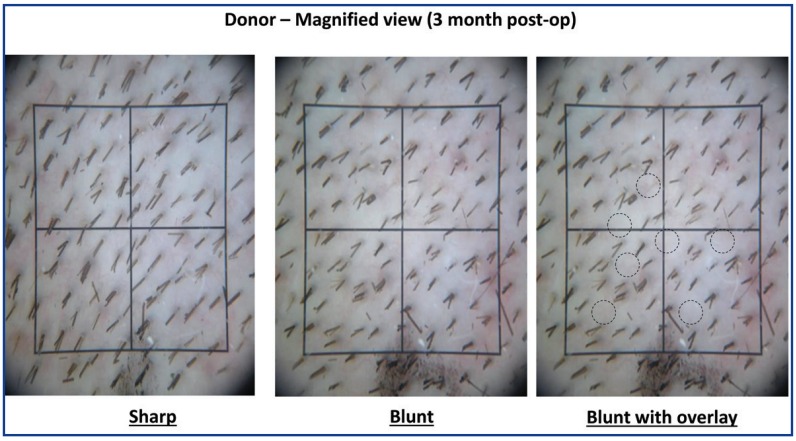

Figure 9. Sharp and blunt sides at post-op 3 months; note patchier appearance on blunt side

Discussion

This study was an attempt to compare some of the differences between the sharp and blunt punch. Although the study was small, a number of potentially important observations were noticed. The skill of the practitioner performing the extractions is indeed an important variable that could have influenced the study's results. Obviously, the more experienced a physician is with sharp punch dissection, the lower the transection rates will be. The same holds true for a practitioner experienced with blunt punches. The only way to truly minimize this variable would be to have the world's best sharp punch practitioner extract one side and the world's best blunt punch practitioner extract the other side. Differences in transection between the two techniques would be less pronounced because the transection rates on both sides would be atypically better than occurs in the average clinical practice. More useful and clinically relevant data though is obtained from a study that compares the results when the same physician who is skilled in both techniques performs the extractions. Now, it is possible that for certain cases different sized punches and different instruments could have been used to give better results. The intent of the study was to use two punches of the same diameter to form a basis for comparison. That is a better reflection of what the potential differences are in the real world.

Transection rates were higher with the sharp punch compared to the blunt punch (~ 20% sharp vs. 6% blunt). In addition, when looking at the type (level) of transection, more than 60% of the transactions occurred closer to the center of the hair. This location for transection is potentially significant at reducing regrowth of follicles according to a number of studies.[1-3]

Another important observation was made during this part of the study that may have implications with respect to studies or transection rates reported from other clinics. It was discovered that in order to get accurate transection data, it was critical to have a "dedicated" assistant evaluating transection before the grafts were sorted or trimmed by other assistants. During the early phase of the study, extremely low transection rates were found. This was initially exciting, but also made the authors suspicious as the numbers were just too good to be true (i.e., 0%-1% for blunt and 4%- 6% for sharp). The data was subsequently reanalyzed. It was discovered that in spite of explicit instructions on how to record transections, assistants who were multi-tasking (i.e., sorting, trimming, and counting transections) were making various errors. For example, sometimes they would trim away minor spicules that they felt were insignificant. Only after modifying the protocol and assigning a "dedicated" staff member to record all the transections she observed before any trimming and sorting was done, did more accurate and reliable results appear. It was then certain that every

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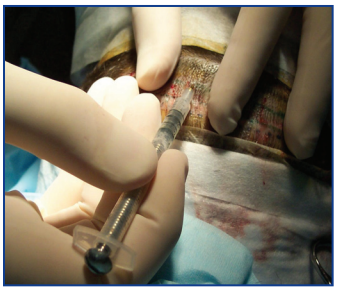
Letters to the Editors

Paul T. Rose, MD, JD, FISHRS *Coral Gables, Florida USA*
paultrose@yahoo.com

Re: Inventions and contributions to our specialty

I received the most recent edition of the *Hair Transplant Forum* and was delighted to see the article by Dr. Otavio Boaventura discussing how he performs long hair FUE (Long Hair FUE and the Donor Area Preview. 2016; 26(5):200-202). I also had the pleasure of meeting Dr. Boaventura during one of the ISHRS mini workshops where he discussed his impressive technique.

As many now know, he uses a slotted punch to perform the technique. After his lecture in a mini course, I related to him that I had demonstrated the use of a slot punch at the ISHRS meeting in 2007 and introduced the punch at a meeting in Greece. At that time, John Cole and I introduced the first limited depth control FUE/FIT punch (see photo). (Speaking with Bill Rassman he indicated that he invented a limited depth device prior to John and I, but he never got around to publishing about it. Knowing Bill it certainly is possible.)



Subsequently, Dr. Boaventura included my name in his ISHRS presentation and gave me credit for invention of the slot punch although his use for long hair is quite different than my original intention to simply decrease transection. I wish to thank Dr. Boaventura for his integrity and kindness.

Additionally, I noted several instances in the meeting where people have, certainly unintentionally, taken credit for developing or inventing a technique or device that was created by someone else. I would urge our younger colleagues to try to carefully review the literature and perhaps inquire of some of the elder states-people in the field whether their discoveries have possibly been made by others previously. It is wonderful that we have a younger group of enthusiastic physicians entering our field who will no doubt make great contributions to the specialty. I think that we all realize that our accomplishments come from being educated by those who have preceded us, and they should be given credit for their efforts.◆

transected hair was being counted. The rates were now slightly higher than some other clinics were reporting. How reliable are transection rates recorded by other clinics and in other studies where a "dedicated" staff member for data collection is not used?

The parameter of hairs/graft was very similar in both of these techniques with a slight edge toward the blunt punch (2.5 sharp vs. 2.6 blunt). There is a concern that if a clinic is only using the hairs/graft parameter to evaluate graft quality, there may be a false sense of security created because it ignores the transections within the grafts. For example, both sharp and blunt punches could produce a hair/graft ratio of approximately 2.4. According to this study though, with the sharp punch there was a greater number of transected hairs within those grafts. If you take into account these partial transected hairs as was also done in the study, the hairs/graft decreases (1.9 sharp and 2.2 blunt). This is not to say that hairs/graft is not important, but it should just not be the only parameter used when evaluating the overall success of FUE extraction. The significance of transection should not be ignored.

An obvious question remains: How important are these transections to the overall survival of the hairs in both the recipient and donor area? A number of studies have shown that transection can influence survival and growth to varying degrees in a negative way.[1] Further studies in this area would be helpful in more completely answering that question.

Another observation was that the issue of decreased yield is not limited to just robotic FUE, but also occurs with both sharp and blunt motorized methods. In this study, the yield with the sharp punch was slightly better than the blunt punch (93% sharp vs. 87% blunt). These were both superior than the average yield reported with earlier versions of the robot (as low as 75%). At the time of this writing, newer versions of the robot have been released, and the yield may have improved. Capping is one of the causes of missing grafts and is highly correlated to the physician's skill in the under-appreciated step of manually removing (pulling) the FUE graft out of the scored incision. Buried grafts are another cause of missing grafts. When looking only at buried grafts, it appears that the blunt punch has an increased incidence of buried grafts compared to the sharp punch (8% vs. 3%).

With respect to scarring, both sides looked similar trimmed with a #1 guard clipper. However, with no guard and under higher magnification, the blunt punch side had a number of extraction sites with no hair, which gave a subtle patchy look. This was consistent with the theory that the sharp punch had left behind some hairs due to transection that may have regrown and contributed to a more even look. While, after only one session of FUE this may not cause any issues, subsequent surgeries may make it more difficult to cover the donor area with shorter hair. The questionable drawback of transected hair with the sharp punch may actually be of benefit to the patient in coverage of the donor area. Most patients who opt for FUE desire the ability to keep their hair short anyway and would prefer a less noticeable transplant.

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Update on European Standards for Hair Restoration Surgery

Greg Williams, FRCS (Plast), FISHRS *London, United Kingdom* dr.greg@farjo.com

The previous chair of the ISHRS Subcommittee on European Standards, Dr. Jean Devroye, published an initial introductory article entitled "Update on proposition of regulations on who can perform HTs in Europe" in the July/August 2011 *Forum* (Vol. 21, No. 4, p. 109). In it, he informed the readership of the existence of the Comité Européen de Normalisation (CEN) and the various European national organisations of normalization such as DIN (Germany), AENOR (Spain), AFNOR (France), UNI (Italy), and BSI (UK), which create European standards for a variety of industries. He explained that the CEN403 Committee on Aesthetic Surgery and Aesthetic Non-surgical Medical Services was created to look at all cosmetic procedures and had been meeting for a year and a half prior to Dr. Devroye's article.

The ISHRS is a Liaison Partner to this Committee so can contribute opinion but does not have a seat. Whilst Dr. Devroye represented the ISHRS, he also represented the Belgian branch of the CEN, the NBE, and therefore attended the CEN403 meetings. In his initial *Forum* update, Dr. Devroye called for European ISHRS members to contribute actively to their national CEN mirror committees so that there would be a common line of arguments.

In the initial stages of the CEN403 project, it was deemed that only General Surgeons, Maxillofacial Surgeons, and Plastic Surgeons were going to be allowed to perform Hair Transplant Surgery. Subsequently, it was decided to have two standards, one for surgical procedures and one for non-surgical procedures. Thanks to the strong leadership of Dr. Devroye, the CEN403 Committee was educated on the differences between strip FUT and FUE and that, around the world, hair transplantation was often performed by doctors without a post-graduate surgical qualification. Because of this point, it was decided to include hair transplantation in the draft *FprEN 16844 Aesthetic medicine services—Non-surgical medical treatments* instead of having it in the surgical standard. As will become clear, this has proven to be a double-edged sword.

In the July/August 2013 *Forum* (Vol. 23, No. 4, p. 125), Dr. Devroye provided a further update including the terminology that would be used to describe who would do procedures: *"The practitioner shall be a medical doctor authorised by national competent authority to practice autonomously. Assistants shall be medical doctors (in training) or nurses who shall be working under the doctor's supervision."* The skills would thus be decided by each European state according to its own legislation.

The cosmetic surgical standard was published as EN 16372 Aesthetic Surgery Services in January 2015 and the CEN403 committee met in Vienna in September 2015 to finalise the non-surgical FprEN 16844. I attended this meeting representing the British Standards Institute (BSI) and also the ISHRS. I successfully lobbied to change the wording to reflect that hair transplant surgical assistants are not always nurses and the new accepted wording was *"Assistants shall be medical doctors, who are in a recognised postgraduate training scheme, or authorized health care professionals who shall be working under the practitioner's direct supervision."*

I also successfully lobbied to have the wording *"hair micrografts (follicular unit transplantation and follicular unit extraction)"* changed to *"Hair Transplantation (Strip Follicular Unit Transplant and Follicular Unit Extraction)."*

Lastly, I successfully lobbied to have the following paragraph inserted that was written by the ISHRS: *"An appropriately trained medical doctor should perform all the steps in a hair transplant procedure that involve incisions in the skin. These would include making Follicular Unit Extraction incisions (or directing those made by a robotic device), harvesting Strip Follicular Unit Transplant donor hair, and making hair transplantation recipient site incisions (whether done using a blade, needle, implanter, other instrument, or robotic device)."*

There were numerous other edits to the document that did not impact on hair transplantation and the draft standard was voted on by the European members in March 2016. Unfortunately, the standard did not get enough support to be published due, in part, to a specific objection by the French mirror committee to the hair transplantation paragraph written by the ISHRS.

Another meeting was therefore convened in Vienna in July 2016 that I again attended. Unfortunately, a stalemate was reached between the British and French delegations over the hair transplantation issue that would have resulted in a failure to publish the whole document, which has valuable guidance on lasers, injectables, chemical peels, and other non-surgical cosmetic procedures.

The French mirror committee did not recognise hair transplantation as a surgical procedure and did not believe it needed to be done by a doctor. The only wording they would agree to was along the lines of *"hair transplantation can be performed under direct supervision of the practitioner"* and *"robotic devices can be run under the direct supervision of the practitioner."* However, *"direct supervision"* is defined elsewhere in the document specifically as *"physically present in the facility"* but NOT necessarily in the room; that is, the French wording would endorse non-doctors to perform hair transplantation or to run a robotic device.

My position as the British mirror committee advisor, as well as representing the view of the ISHRS, the French Hair Restoration Surgery Society, and 6 other European Hair restoration Societies (Belgian, German, Hellenic, Ibero Latin American, Italian, and Polish) was that this wording was not acceptable.

The French mirror committee publicly stated that they did not recognise, or agree with the opinion of, the ISHRS, the French Hair Restoration Surgery Society, the British Association of Hair Restoration Surgery, or the other 6 European hair restoration surgery societies listed above. The French mirror committee referred to French regulations that supported their opinion but would not specify what these regulations were, and they refused to send them to me when I requested them.

The fundamental difference of opinion was on whether a doctor should perform the surgical steps of a hair transplant procedure. As the publication of the standard depended on resolving this issue and no agreement could be made, it was proposed, voted on, and agreed to remove hair transplantation completely from the standard.

There were many other contentious issues that needed to be addressed at the meeting, most of which were successfully resolved, and the standard will go to a further European vote at the end of 2016. If it passes the vote, hair transplantation will be left without a European Standard to refer to as it will not be part of either the cosmetic surgical or non-surgical standards. The British Standards Institute, with the support of the ISHRS, will then consider whether to write to CEN to address this, perhaps by creating a specific European standard for hair transplantation where its unique issues can be identified. If the standard does not pass the vote, then hair transplantation along with the non-surgical cosmetic procedures will remain without the guidance in Europe that a CEN Standard would have provided. In this situation, it is unclear what the next steps would be.

The ISHRS has formally written to the French mirror committee to request details of the regulation of hair transplantation that had been referred to in the meeting, but there had been no response at the time this update was going to print.◆

Review of the Literature

Jeff Donovan, MD, PhD, FISHRS *Toronto, Ontario, Canada* donovan.jeffrey@gmail.com

Testing Lipids in Patients with Androgenetic Alopecia

Kim, M.W., et al. Lipid profile in patients with androgenetic alopecia: a meta-analysis. *J Eur Acad Dermatol Venereol.* 7 October 2016. doi: 10.1111/jdv.

Several previous studies have suggested that individuals with androgenetic alopecia may have an increased risk for "metabolic syndrome"—a constellation of conditions that include hypertension, impaired blood sugars, abnormal lipids, and obesity. All of these raise the risk for heart disease and stroke.

Researchers from Korea performed a meta-analysis on 19 pooled observations studies. Levels of total cholesterol, triglycerides, LDL cholesterol, and HDL cholesterol were compared between those with AGA and control. Results showed that total cholesterol, TG, and LDL levels were significantly higher in individuals with AGA and HDL levels were lower. The authors concluded that individuals with androgenetic alopecia have statistically significant differences in their lipids profiles compared to those without AGA.

Comment: This study adds to a growing body of studies supporting dyslipidemia in individuals with androgenetic alopecia. There is a clear need for us as hair physicians to work with physicians in other fields of medicine (cardiologists, general practitioners, endocrinology) to critically examine the relationship between androgenetic alopecia and metabolic syndrome and to develop clinical practice guidelines for blood pressure monitoring, cholesterol evaluation, and diabetes testing in our patients.◆

The JAK Inhibitors in Alopecia Areata: More Data in Support

Mackay-Wiggan, J., et al. Oral ruxolitinib induces hair growth in patients with moderate-to-severe alopecia areata. *JCI Insight.* 2016; 1(15):e89790. doi:10.1172/jci.insight.89790.

Kennedy Crispin, M., et al. Safety and efficacy of the JAK inhibitor tofacitinib citrate in patients with alopecia areata. *JCI Insight.* 2016; 1(15):e89776. doi:10.1172/jci.insight.89776.

The JAK inhibitor drugs ruxolitinib and tofacitinib have found their way onto the lists of bona fide treatment options for patients with advanced alopecia areata. Two new studies support their use in refractory cases.

Mackay-Wiggan reports results of an open label trial of 12 patients with moderate to severe alopecia areata using oral ruxolitinib at a dose of 20mg twice daily for 3-6 months followed by 3 months off the drug. Nine of 12 patients reported growth with no serious adverse events.

In the same journal, researchers from Yale and Columbia Universities reported results of a study of 66 patients with advanced alopecia areata (including totalis and universalis). Patients received tofacitinib 5mg twice daily for 3 months. Patients with alopecia totalis and universalis were less responsive than patients with alopecia areata, but overall about one-third of patients experienced 50% or greater improvement of the SALT score (a method of assessing hair coverage in alopecia areata). Importantly, patients relapsed very quickly when the medication was stopped—losing hair within 8.5 weeks of stopping.

Comment: Ruxolinitib and tofacitinib continue to show benefit in patients with advanced alopecia areata. The drug continues to show a good safety profile, with low risks of serious infections. This safety data is extremely important as it has been the main factor that has limited or slowed approval of these drugs for various conditions around the world.◆

Scalp Cooling to Prevent Chemotherapy-induced Alopecia

Komen, M.M., et al. Results of scalp cooling during anthracycline containing chemotherapy depend on scalp skin temperature. *Breast.* 2016(Sep 27); 30:105-110. doi: 10.1016/j.breast.2016.09.007. [Epub ahead of print].

It is now clear that reducing the temperature of the scalp can prevent hair loss for many cancer patients during chemotherapy. A number of scalp cooling devices are now available. In a new study, 62 patients with breast cancer undergoing chemotherapy received scalp cooling. The temperature of the scalp was monitored. The primary end point was whether or not a patient needed a wig. In this study, 13 of 62 patients did not need a wig or other head covering. The skin temperature of these patients was 18°C compared to 20°C for patients who did require a wig or head cover.

Comment: Scalp cooling has increasing popularity as a means to reduce hair loss during chemotherapy. The efficacy of scalp cooling appears to be temperature dependent and temperatures at or below 18°C may be more effective.◆

Hair's the Question*

Sara Wasserbauer, MD, FISHRS *Walnut Creek, California, USA* drwasserbauer@californiahairsurgeon.com

*The questions presented by the author are not taken from the ABHRS item pool and accordingly will not be found on the ABHRS Certifying Examination.

Just when you thought you were safe, I had so much fun putting together that first set of Mimics questions that I decided to do another. Besides, THIS time I wanted to see if I could stump our new Forum editors with some "repurposed" photos! Once again, these are hair loss conditions that are difficult to diagnose due to the fact that they closely mimic other completely different hair loss conditions. Test your ability to spot the chameleon!

Mimics Part 2

1. This 54-year-old female of African descent wants to lower her hairline. She says her hairline has been this way for years but she does not recall when or how it happened since she was a volunteer for the Peace Corps for 20+ years. She also has had recent onset of brow thinning (with recent tattooing visible). You immediately suspect congenital high hairline since the hairline is at roughly 10cm and start to draw where you would place a new hairline. What ELSE is this very likely to be?
   A. Female pattern hair loss (FPHL)
   B. Frontal fibrosing alopecia (FFA)
   C. Traction alopecia
   D. Trichotillomania

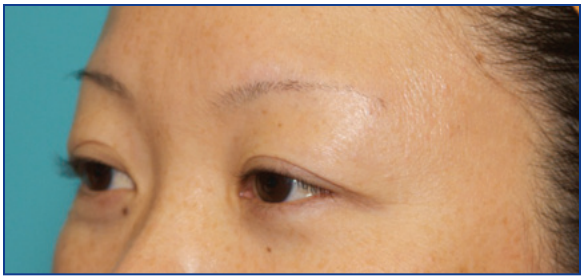
2. This middle-aged female has had a recent onset of brow thinning (especially at the outer one-third to one-half of each brow) and hairline recession. She is otherwise completely healthy and all labs are normal. The skin appears smooth but you do not do a microscopic examination because you immediately suspect frontal fibrosing alopecia (FFA). What ELSE is this very likely to be?
   A. Hypothyroidism due to the brow loss
   B. Alopecia areata due to the presence of white hairs seen at the margins
   C. Trichotillomania
   D. Traction alopecia

3. This patient is a 23-year-old African American female who typically wears a hat to hide her condition, which has been present for many years. She admits to wearing tight braids when she was a child. You immediately suspect traction alopecia. What ELSE is this very likely to be?
   A. Ophiasis type alopecia areata
   B. Retrograde alopecia
   C. Central centrifugal cicatricial alopecia (CCCA)
   D. Alopecia areata

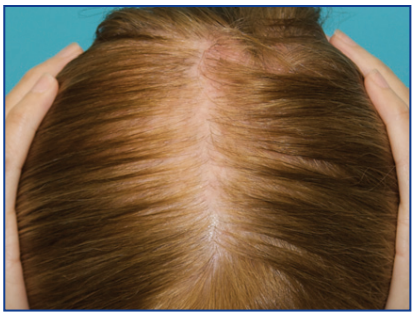
4. This 52-year-old male patient presents to your office hoping for a hair transplant surgery on the front of his head. He said his hair loss became noticeable over a short period—only a few years. You immediately suspect Ophiasis type alopecia areata. What ELSE is this very likely to be?
   A. Traction alopecia
   B. Retrograde alopecia
   C. Central centrifugal cicatricial alopecia (CCCA)
   D. Alopecia areata

5. This patient is a 54-year-old male who wants his crown filled in. There is no miniaturization anywhere in the donor area and the density is 70-90 FU/cm^2 throughout. You see he has adequate donor area for either an FUE or a linear "strip" procedure, but you are concerned during your donor area management planning because you immediately suspect retrograde alopecia at the nape area. What ELSE is this very likely to be?
   A. Diffuse unpatterned alopecia (DUPA)
   B. Post FUE overharvesting
   C. Normal low density nape donor hair
   D. Localized graying and Cutis Verticis Gyrata (CVG)

6. This 24-year-old patient of Asian descent presents to you for FUE surgery to fill in his crown. The thinning seems to be diffuse all over (density 50-60 FU/cm2 with 30% miniaturization at the donor area). You immediately suspect localized graying with possible CVG (Cutis Verticis Gyrata) at the crown. What ELSE is this very likely to be?
   A. Diffuse unpatterned alopecia (DUPA)
   B. Post FUE overharvesting
   C. Normal low density donor hair
   D. Normal male pattern hair loss in a male of Asian descent



7. Of the following pairs of diagnostic mimics, which of the following answers is the most likely pair?
   A. Hypothyroidism and alopecia areata
   B. Hyperthyroidism and trichotillomania
   C. Overplucking and hypothyroidism
   D. Frontal fibrosing alopecia and hyperthyroidism



8. Short of a biopsy, how would you EXCLUDE female pattern hair loss (FPHL) as a diagnosis?
   A. Microscopic analysis demonstrating the presence of miniaturized hair.
   B. Microscopic analysis demonstrating lower density of follicular units.
   C. Microscopic analysis demonstrating new growth.
   D. Microscopic analysis demonstrating loss of the follicular ostia.

9. What are the two most likely diagnoses in your differential for this 23-year-old female patient?
   A. Focal female pattern hair loss (FFPHL) and central centrifugal cicatricial alopecia (CCCA)
   B. Alopecia areata and trichotillomania
   C. Alopecia areata and lichen planopilaris (LPP)
   D. Trichotillomania and Pseudopelade (of Brocq)

⇨ Answers on page 264

Hair's the Question from page 263

Answers

1. **B.** The smooth skin and the abrupt demarcation at the hairline are clues, as would be any line of sun damage below where the current hairline is. You can see that even I was fooled, because *I* am the one who drew the hairline right before I took the photo and got suspicious. In this case there was no perifollicular erythema or scaling to speak of, so it was likely burned out, but the brow loss was new and recent so reactivation should definitely be suspected.
2. **D.** The hairstyle is kind of a dead giveaway. White hairs are commonly seen when alopecia areata areas are recovering. Trichotillomania is possible, but less likely. Microscopic exam results were NOT given since it would have made it too easy to exclude FFA (on the basis that it would NOT show perifollicular erythema).
3. **A.** Traction alopecia affects the margin of the hair where it has been pulled, but given the preservation of the nape hair and the line of demarcation at the superior edge, ophiasis type alopecia areata is the most likely. Give yourself half a point for answer D (alopecia areata). Central centrifugal cicatricial alopecia (CCCA) would be at the top of the head.
4. **B.** How do you tell the difference between this and ophiasis type alopecia areata? Miniaturization would likely be present and the appearance of the skin under microscopy would be normal (i.e., NO exclamation point hairs). Biopsy if uncertain, however!
5. **D.** This patient did NOT have miniaturization even at the nape of his neck and the density was within a range that DUPA would be less likely. Planning for donor management should not include nape hair anyway, but in his case it was simply localized graying that gave the visual appearance of retrograde alopecia.
6. **A.** The low density with the miniaturization is the key. FUE overharvesting is possible of course, as is low-density donor hair, but the miniaturization still makes DUPA the likely diagnosis. Okay—so the localized graying with CVG did not exactly fit in this case—but I was on a roll and I didn't want to break my pattern!
7. **C.** The loss is diffuse along the brow with slightly more lateral loss (consistent with hypothyroidism) and there is little in the way of skin changes to make you suspect FFA. The hairs are also extensively trimmed, leading to the likelihood that this patient spends a lot of time managing her brow hair—and thus overplucking seems more likely. There is always a fine line between "overplucking" and trichotillomania, but hyperthyroidism does not lead to the same sort of brow loss as hypothyroidism, so B was not the answer.
8. **D.** Loss of the follicular ostia would indicate a cicatricial (scarring) alopecia and a biopsy should be done. New growth, low density, and miniaturization can all occur with FPHL and thus would not exclude that diagnosis. For the record, this is lichen planopilaris.
9. **B.** Without even looking microscopically or asking the history, alopecia areata and trichotillomania would be most likely with this global appearance and patient profile. Biopsy is the next best step! For the record, this is alopecia areata.◆

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How I Do It

Timothy Carman, MD, FISHRS *La Jolla, California, USA* tcarmanmd@mac.com

The Las Vegas 2016 ISHRS World Congress saw international attendance and a curriculum that has been hailed as the most comprehensive and intellectually stimulating in recent memory. Continuing with the tradition started following last year's Congress, we will present poster winners here in the "How I Do It" column in order to share and memorialize our colleague's achievements.

This year, we congratulate Drs. Oguzoglu, Ahn, and Saxena on their respective achievements, and we thank them for their work and contribution to our Society by sharing their observations with us. Sharing our ideas with one another makes us clinically stronger as a collective group in the ISHRS. Please feel free to email me your ideas at tcarmanmd@mac.com for consideration for publication in our journal.

On a more personal note, I would like to take the time to convey what an honor it has been working with Drs. Bob True and Mario Marzola. I have benefited personally and professionally by their sage guidance and advice, and I know I speak for "all of us" when I say thank you for your time, effort, and attention over these past three years in bringing us timely and relevant issues in the clinical as well as research corridors of all things related to hair at the helm of the *Forum.* Well done guys! I would also like to welcome Drs. Brad Wolf and Andreas Finner as the incoming co-editors of the *Forum.* Those are some big shoes to fill, but I am confident we will again raise the bar!

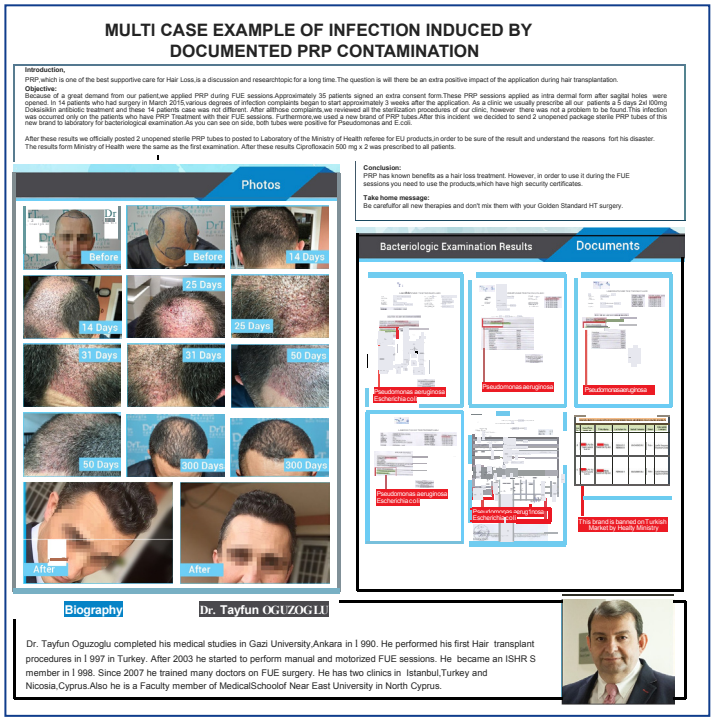
Poster Winners from the 2016 24th ISHRS World Congress

First Place Prize Poster Presentation

Multi Case Example of Infection Induced by Documented PRP Contamination

Tayfun Oguzoglu, MD

Our first place poster winner this year was Dr. Tayfun Oguzoglu, who completed his medical studies at Gazi University in Ankara, Turkey, in 1990. He has been performing hair transplantation surgery since 1997, and practices in Istanbul, Turkey, and Nicosia, Cyprus. His poster presentation recognized the unwelcome infective complication, which he determined was the direct result of contaminated supplies, specifically the PRP tubes provided with his PRP processing equipment. His work calls attention to the need for surgeons to critically evaluate commercially available therapies in a burgeoning market of supplemental therapy modalities available in the hair transplantation field. Again, quality control is an issue we all must be aware of, and this includes scrutinizing the suppliers on which we, and ultimately our patients, rely. Kudos to Dr. Oguzoglu.

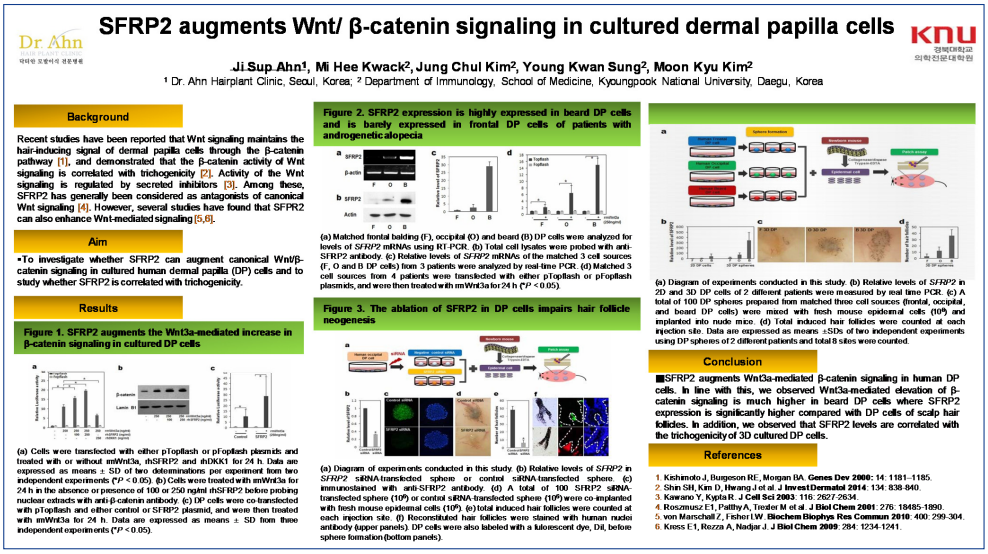


Second Place Prize Poster Presentation

SFRP2 Augments Wnt/β-Catenin Signaling in Cultured Dermal Papilla Cells

Jisup Ahn, MD, PhD, FISHRS

Our second place winner was Dr. Jisup Ahn, who practices hair transplantation surgery in Seoul, Korea, and conducted his studies in conjunction with The Department of Immunology at The School of Medicine, Kyoungpook University in Daegu, Korea. Wnt/beta-catenin signaling maintains the hair-inducing signal of dermal papilla cells, which is correlated with tricogenicity, that is, hair growth initiation. SFPR2 has long been considered to be antagonistic to this process. Exploiting biochemical signaling differences in beard hair vs. scalp hair in MPHL, Dr. Ahn concluded that SFRP2 in fact can also augment Wnt-mediated beta-catenin signaling in human dermal papilla cells. It is this type of detailed research that will lead us ever closer to understanding the biochemical and biogenetic factors that turn "on" and turn "off" hair growth, which results in cosmetically unacceptable consequences in patients affected by MPHL, FPHL, and, hopefully, the cicatricial alopecias as well. Well done, Dr. Ahn.

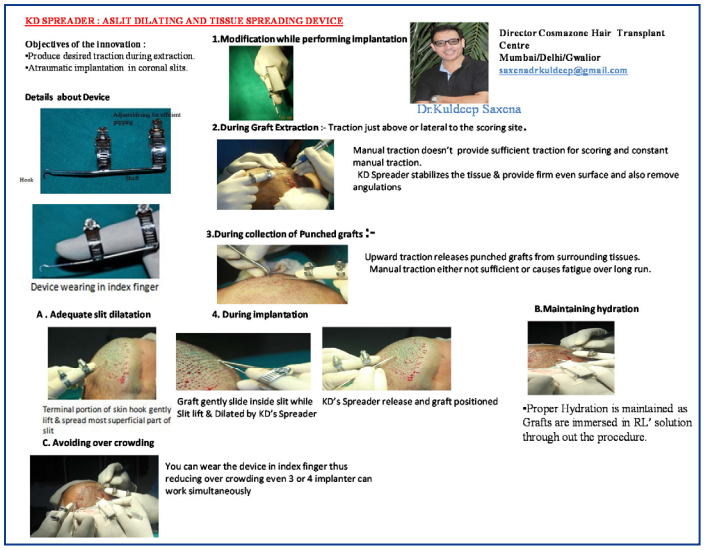


Best Practical Tip Poster Presentation

KD Spreader—A Slit Dilating and Tissue Spreading Device

Kuldeep Saxena, MBBS, DDV

Our Best Practical Tip winner is Dr. Kuldeep Saxena, who is the director of the Cosmazone Hair Transplant Centre in Mumbai, Delhi, and Gwalior, India. Dr. Saxena presented a device that is worn on the index finger that both elevates and dilates graft recipient sites, making graft placement less traumatic and more precise, according to his described method. According to Dr. Saxena, it also reduces fatigue associated with graft placement, and who wouldn't welcome that! Thank you, Dr. Saxena for this useful tip.



Meetings and Studies

Henrique N. Radwanski, MD *Rio de Janeiro, Brazil* hnradwanski@hotmail.com

What a great show in Las Vegas!

As they say, if you want a great show, then Las Vegas is where you should go. For personal reasons, I could not attend, but the 24th World Congress of the ISHRS clearly surpassed its expectations. Reading the following reports on each Workshop and the General Sessions, one has to congratulate the scientific committee for the impressive scope of the event. Besides core clinical studies and basic science, there was an incredible amount of practical courses for the beginner as well as the experienced specialist. I am grateful to the writers for their collaboration.

As this is my last contribution to this Meetings column, I have to thank Bob and Mario for their support and friendship. It was a great privilege to have participated in this superb publication, and I wish success for the next editorial team. The show must go on!

Review of the 24th World Congress of the International Society of Hair Restoration Surgery

September 28–October 1, 2016

Las Vegas, Nevada, USA

Las Vegas
ISHRS 24TH WORLD CONGRESS
SEPT 28-OCT 1, 2016
INTERNATIONAL SOCIETY OF HAIR RESTORATION SURGERY
CAESARS PALACE • NEVADA • USA

THURSDAY/SEPTEMBER 28, 2016

Piero Tesauro, MD *Italy*

The 24th Annual Scientific Meeting opened with a speech by President Kuniyoshi Yagyu. He stressed that the ISHRS is a truly international society with an increase of 154 new members per year. All the efforts made by the Society over the years have allowed transferring the meeting from Panama to Las Vegas making possible what seemed impossible. The ISHRS is a non-profit organization that this year has invested some of its funds in educational workshops that are offered free of charge to its members, and in the education of the public. He then introduced the issues about delegation and he underlined that the simple rule "Do no harm" is often not enough and we should stand united under the flag of our Society.

Next, Dr. Bob Haber introduced the voting pool and presented some interesting elements regarding the members that started to appear on the screen between whispers, surprised faces, and assents.

The first day's topic were cell therapy, gene therapy, and biotechnology with Dr. Aditya Gupta acting as moderator. The first presentation "Biotech Updates in Hair Growth," by Dr. Nilofer Farjo, highlighted that for many members of our Society, hair research is still a hostile field to approach, especially when we don't understand all the translational applications. She then described some of the directions that the new studies are taking. Particularly interesting were the mechanism of regulation of the hair cycle and specifically the role of JAK inhibitor drugs that recently came on the market. She also gave an update on the works about the microenvironment and the role of the adipocyte and the macrophage cells and their interaction with the follicular stem cells. Though the "Eureka!" moment isn't here yet, we are here to search for it.

Guest Speaker Pantelis Rompolas presenting "Potency and Contribution of Stem Cells to Hair Follicle Regeneration."

Guest speaker Dr. Pantelis Rompolas gave a brilliant presentation entitled "Potency and Contribution of Stem Cells to Hair Follicle Regeneration." He illustrated his *"in vivo"* studies, placing live cells (the entire mouse in fact) under the microscope for 24 hours. So far, he was able to record and analyse the movement of different type of labelled follicular cells. For the first time, we can follow the cells *in vivo* and their destiny is now a lot clearer. Dr. Rampolas's team of researchers applied a laser-selected ablation on different groups of follicular cells and described how with this action they were able to change the hair cycle. The research so far has had the purpose to clarify which cells are essential in the regenerative process. Dr. Rampolas came to the conclusion that the dermal papilla cells are absolutely necessary to restart the anagen phase while, on the other hand, the loss of the stem cells of the bulge area will not impair the regeneration. This compressed description of his work made clear that a new and more realistic model brings the researchers to a different level of understanding.

Next, Dr. Francisco Jimenez's presentation "The Sweat Gland" demonstrated how for decades the drawings of the skin in the histological books have been wrong. They always show the eccrine glands separate from the hair follicle while Dr. Jimenez demonstrated that the eccrine gland is an integral anatomical part of the follicular unit, located below the sebaceous gland. However, its interaction with the stem cells and its role in the wound healing still need to be clarified. For now, we can start asking our transplanted patients if they "sweat more or less after the operation?"

During the Q&A, Emina Vance asked how we should consider the short hair that we see in many follicular units during the dissection. The conclusion of the panel was that if the calibre of short hair is fine in comparison with the others, then this is a

miniaturized hair, whereas if the calibre is the same, then it's a telogen hair and should be treated as such during graft preparation.

A little break gave us the time to visit the exhibits and view some of the many interesting posters. This was followed by four presentations about the current perspectives in hair restoration surgery, which were moderated by Dr. Haber. Dr. William Rassman pointed out that in today's society, where the main focus seems to be on the best machines, only a few surgeons focus on quality. The worst enemy in our field is our Dr. EGO, and even though it sounds repetitive, 5,000 FUs extracted in an FUE operation will decimate in the vast majority of cases the donor area and this depletion is like "a visit to an old ghost." This concept has been sustained also by Dr. Brad Wolf that clarified that occipital thinning is a great mistake and during the extraction phase important issues such as the number of grafts, the limits of the donor area, and where to split, are decisions that cannot be made by the technicians. Dr. Ron Shapiro's work explored the limits of the donor area and how a good operation plan should include FUE, FUT, or a combined technique. The last presentation of this session was the experimental work done by Dr. Jean Devroye on the effects of FUE transection on graft growth. He came to the conclusion that transection definitely affects hair survival. We should all be thankful for this kind of research, because it is well known how this work on "control and count" is extremely time consuming. Dr. Devroye's new device for FUE was born on the latter concept, to preserve the integrity of the follicular unit that, even though extracted with the FUE method, looks similar to an FU dissected after a strip.

Program Chair Marcelo Pitchon giving the opening address.

Before the lunch break it was time for Dr. Carlos Puig to moderate "FUE Delegation: Is it Ethical & Legal?". An interesting acronym was used: C2Q, which stands for "Critical to Quality," a word created by Dr. Robert True in this Forum 1 year ago that will probably become an important "leitmotiv" of our Society meeting. Then, Dr. Peter Gaido, a lawyer from Chicago, explored the same topic trying to clarify what can and cannot be done by technicians in our office. In every single state and country the laws are different, but there are always many good reasons to think before you delegate.


Mauro Speranzini presenting "FUE Graft Placement with Dull Needle Implanters into Premade Sites."

During the Lunch Symposium, our brilliant "actor" members simulated a patient interview with Dr. Jim Vogel acting as Surgeon, Dr. Vincenzo Gambino as the patient, and Dr. Sharon Keene as the anxious wife.

After lunch, moderator Dr. Damkerng Pathomvanich introduced his panel "New and Available Possibilities in Hair Restoration," which included different presentations. The first one from Dr. Anil Garg was on the histological and clinical evaluation of plasma as a graft holding solution. The experiment was brilliant and even if the study was conducted on a limited number of cases, the new solution appears to be very efficient in terms of hair growth and hair survival. The solution does not require cooling, grafts seem to be perfectly protected, and the regrowth after 4 months is faster than what we have obtained with saline solution. So could we jump to the conclusion that frequently the best solutions are just near our hands? With a few modifications, will this be the next gold standard?

Then Dr. Taleb Barghouthi presented a multicenter study that demonstrated how the preoperative scalp massage exercises performed with a good compliance of the patient can significantly improve the scalp elasticity prior to an FUT operation. Dr. Dae-Young Kim presented "Punch-and-Place Grafts Technique with Choi Implanters for Wide 4th Degree Burn Scalp Scars." In his video, the recipient sites in the burned area were prepared with a very small punch. In a couple of sessions, the coverage was excellent and we can conclude once more that, on selected case, hair restoration can be a substitute for a skin expander, and that the limit of its application in this field should probably be redefined. After the Q&A, it was time for the first session of surgical videos to start; particularly interesting were the videos brought by Dr. Ali Karadeniz and Dr. Jae-Hyun Park. The first one brought our attention to consider the FTR (follicular transection rate) percentage as a guide to keep in mind during the operation, with consequent critical adjustments. The second video demonstrated how the non-shaven, pre-trimmed technique can be performed with good speed and a low transection rate. Even for surgeons who will not consider this approach, it can be very useful on selected cases, like the eyebrow transplant.

The last round of presentations, "Recipient Area," was moderated by Dr. Paul Rose and discussed the different approaches. Dr. Hwang showed in video the advantage of the implanter device he invented in which the tip is sharper than other models and the small plastic stop on the side of the needles allows for a perfect depth control for graft placement. The ideal and perfect matching between the FU and the skin level during the placement process has been described previously, but Dr. Hwang's contribution to this topic will not remain unobserved. Following, Dr. Mauro Speranzini showed his video "FUE Graft Placement with Dull Needle Implanters into Premade Sites," which clarified a lot of important details. A perfect coordination between "the loader" technician and the doctor will lead to a successful placement. The loader must recognize the importance of loading the FU facing the concave side and the sebaceous gland. The implantation is done in one movement without the necessities of final rotation to reach the correct direction.

Dr. Wolf showed how we can find the appropriate location for every type of graft thus obtaining a better and more effective graft placement, while Dr. Jerzy Kolasinski outlined the importance of preparing poor recipient area prior to the operation with fat grafting. It was made clear how the combination of surgeries make the frontier of the FUT wider. Finally, Dr. Gholamali Abbasi explained how the correct understanding of the blood supply of the scalp could be used as a guide for the surgeon to reduce the risks of scalp necrosis. Some intraoperative signs were taken into consideration, such as the immediate post-operative management. During the subsequent Q&A, Dr. Rassman

Moderator Carlos Puig with the panel discussing "FUE Delegation: Is It Ethical & Legal?"

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proposed the use of aspirin to reduce the extent of the area of ischemia while Dr. Kolasinski proposed the use of sublingual nitroglycerin. The day ended with the Welcome Reception in the gorgeous Octavius Ballroom, where all the participants met for drinks and enjoyed talking about the eye-opening day spent together.

FRIDAY/SEPTEMBER 30, 2016
Marco N. Barusco, MD, FISHRS *USA*

The second official day of the ISHRS World Congress began just like the previous one: an early start and a jam-packed program. (I was particularly excited with Friday. I was asked by the ISHRS to grade all the lectures for the day, and was looking forward to many of them.)

Donor Area panel, moderated by Bob True.

During breakfast, there were 28 Discussion Table Topics covering everything from FUE to FUT to PRP and other acronyms, including ADSC (Adipose-Derived Stem Cells). Each table was manned by one or two experienced faculty and participants were free to spend as much or as little time as they pleased in each table. With an open discussion format, these tables are always popular during the ISHRS meetings and afford a lot of interaction between faculty and participants, with great exchange of information. Dr. David Josephitis and I were responsible for the "FUE Megasessions: Planning and Execution" table topic, and we had quite a few people talking to us.

From 9:00AM-10:30AM, the Morning Workshops took place. These were ticketed items but were included in the registration fee. I especially liked the fact that, while only ticketed participants were allowed into each room at first, after 8:55AM anyone could enter if there was still room available in any of them. All workshops were well attended and comments from participants were very positive.


Featured speaker Alan Jacobs presenting "Post-Finasteride Syndrome and the Neuroendocrine System."

The morning ended with a great panel on finasteride. Moderated by Dr. Ken Washenik, the panel's featured speaker was Dr. Alan Jacobs, a Neuroendocrinologist from New York. Dr. Jacobs gave a great lecture about Post-Finasteride Syndrome, tying it together with the neuroendocrine system. He sees a number of men with these symptoms and gave us a good review on the neuroendocrine pathways and how finasteride may affect them. Also, he gave good insights on what tests to order when checking patients for these symptoms. A panel discussion followed, with panelists Drs. Robert Bernstein, Edwin Epstein, Nilofer Farjo, and Russell Knudsen. *(Editor's note: As these same findings can be found among men who have never taken finasteride, it still remains unclear whether there is a causal relationship.—RT)*

In the afternoon, with a second round of workshops, it was possible for people like me to see two topics of interest, one in the morning and one in the afternoon. I had signed up for the afternoon PRP workshop with Dr. Robert Niedbalski. I thoroughly enjoyed it and learned a lot from the course.


Advances in Hair Biology Lecturer, Rod Sinclair, presenting "Androgenetic Alopecia and Changing the Way We Use Minoxidil to Treat It."

The afternoon workshops were followed by another guest lecture. This time moderated by Dr. Dow Stough, Dr. Rod Sinclair gave a great talk on the biology of AGA and discussed the use of minoxidil orally to treat it. This is an interesting perspective on the use of oral minoxidil, which has not been done for hair loss. Following Dr. Sinclair's lectures, Drs. Michael Beehner and Georgios Zontos presented studies they have conducted on graft stress and transection rate on FUE, respectively.

The General Session wrapped up the afternoon with a session on donor area that was moderated by Dr. Robert True. Talks included FUE techniques, robotic FUE, long hair with FUE, different punches for donor hair removal, and the use of ultrasound technology to determine hair angle. For most of the participants, this was the end of Friday. However, for a smaller group, myself included, the day still had the Morbidity & Mortality (M&M) Conference, a ticketed event charged separately from the meeting. Dr. Márcio Crisóstomo chaired this conference, and very interesting cases were presented and discussed by the faculty and participants. On a personal note, I enjoyed this day quite a bit. Overall, the entire ISHRS World Congress was a great event, full of action and great talks/speakers. The site at the Caesars Palace proved to be once again a great choice, with easy access to everything. The scientific content was also at a very high level, with great guest speakers and a room packed with exhibitors.

ISHRS/ABHRS Morbidity and Mortality Conference
Bessam Farjo, MBChB, FISHRS United Kingdom

This year's M&M Conference provided a rich variety of case reports that were much appreciated by the packed room. Drs. Bob Leonard and Matt Lupresti presented a case of post-op infection following a procedure in a patient who had multiple sessions with them without past issues. This was suspected 2 weeks following surgery and was florid enough to send the patient to the hospital where he was diagnosed with life-threatening MRSA. Happily, the patient recovered well and so did his hair transplant.

Dr. Ali Abassi reported another case of post infection in a patient operated on by unlicensed technicians in an "illegal" clinic. Once again, the patient recovered with antibiotics and exhibited good hair growth eventually.

Dr. Greg Williams showed a peculiar case of greying non-transplanted hair shafts shortly after hair transplant surgery adjacent to the recipient area. The hairs grew out grey from the root and this grey section migrated outwards like a band over time. No conclusion was reached about the cause of this, but the hair color recovered eventually.

Dr. Bill Rassman presented a case from another practice where the patient's hairline lowering transplant largely failed, and what remained exhibited hairs growing in wrong directions. The patient went to have electrolysis to solve the issue but ended up with burns resulting in a sparse and chaotic looking hairline.

Dr. Jean Devroye showed an FUT case of his after 3,000 grafts. The only thing of note was that the patient was a heavy smoker. All went well, but at day 11 post-op, the patient reported a puss exuding lesion in the center of the frontal forelock. The diagnosis was Staphylococcus infection, and

this led to necrosis on day 14. The crust was removed, the area debrided, and it was noted that hair was actually growing! The patient recovered well and reported that he was putting honey on it for "protection." Dr. Devroye, at a later date, used FUE to fill the scarred area with 500 grafts and there were no further issues.


Discussion Table Topics

Dr. Craig Ziering accepted a patient referral from a physician friend who was 4 weeks post-op after a hair transplant with this friend. He had recipient site necrosis that Dr. Ziering decided to debride. On doing so, he discovered that this resulted in exposing a hole in the scalp all the way down to the periosteum. Obviously, Dr. Ziering ended up with an unhappy patient on his hands and had to nurse him through 9 months of healing. Eventually, he performed a 3,000 graft FUT to fill the defect and send the patient off happy.

Dr. Grant Koher presented a scary incident with a patient. Basically an hour or so after surgery, the patient reported a headache, an ear ache, and feeling hot and red in the face. This followed by difficulty in breathing and the feeling of a tightening throat. Suspecting this was a case of anaphylactic shock, Dr. Koher administered subcut epinephrine and Benadryl IM and the patient started recovering. A year or so later, the patient came back and wanted another transplant. Dr. Koher avoided any factors that could have caused the initial allergic reaction, but once again the patient experienced anaphylactic shock! No causative agent was ever identified by specialists, and he was eventually diagnosed with idiopathic anaphylaxis.

Dr. Márcio Crisóstomo, who expertly chaired this year's M&M Conference, presented the next case. This was a female with cicatricial alopecia and poor donor area. Dr. Crisóstomo was reluctant to operate but the patient convinced him that anything was better and she would be happy to wear a hair system if it failed or her donor suffered. The transplant not only failed to grow, but her donor area was worse and with scar, and the patient was very unhappy despite her informed consent up front. She refused any more treatment attempts. This was a case when perhaps the patient was too desperate and not quite appreciative of the consequences.

The last case was reported by Dr. Anil Garg, but it was not one of his patients. This concerned the death of a 22-year-old medical student after a hair transplant that was widely reported by the world media a few months ago. After all the allegations about the doctor's qualifications and the state of the establishment, it turned out that as far as the day of surgery was concerned all was above board. The patient was fine throughout, but he felt unwell a couple of hours after discharge. He still proceeded to travel a long distance to his home village, where his diarrhea and vomiting worsened and he died within 2 days. The death certificate is still to be issued, but the suspicion now is that he had a case of acute gastroenteritis that started before the transplant but the significant symptoms only appeared afterwards. The long journey home and the dehydrating conditions that followed led to his death.

SATURDAY/OCTOBER 1, 2016
Jay Straga, MD *USA*

The final day of the conference opened with another set of Discussion Table Topics. Twenty-three 2-person teams hosted open discussions on a variety of subjects ranging from implanters to FUE and FUT, ethnic considerations, medial and biomodulation therapies, and special techniques for temples and eyelashes. All tables were well attended and had lively discussions.

The General Session opened with moderator Dr. Nilofer Farjo announcing the Poster Awards & Research Grants. Dr. Tayfun Oguzoglu was the first-place poster winner with his study entitled"Multi-Case Example of Infection Induced by Documented PRP Contamination." His study found that the PRP sterile kits were contaminated. The second-place poster winner was Dr. Jisup Ahn's "SFRP2 Augments Wnt/β-catenin Signaling in Cultured Dermal Papilla Cells." Dr. Kuldeep Saxena received Best Practical Tip for his poster entitled "KD Spreader—A Slit Dilating Device."Research grant winners included Drs. Claire Higgins and Greg Williams for "The Study of Bisulfate Sequencing of Human Dermal Papilla Cells"; Drs. Paul Shapiro, David Josephitis, and Mark Schuler for "Use of Finasteride and the Onset of Depression: A Prospective Cohort Study"; Dr. Ken Williams for the multicenter study "Bicellular Congenital Therapy in Hair Loss"; and Drs. Brad Wolf and John Cole for "Growth Factor Concentration Influence on Scalp Hair Grafts."


Norwood Lecturer Angela Christiano presenting interesting work with JAK inhibitors, hair regeneration, and genetic testing.

Norwood Lecture: Dr. Nicole Rogers moderated this year's Norwood Lecture and lecturer Angela Christiano, Professor of Dermatology and Genetics & Development at Columbia University College of Physician & Surgeons, presented interesting work with JAK inhibitors, hair regeneration, and genetic testing.

Dr. Christiano's current work centers on *in vitro* growth of hair follicles and monitoring their outcomes. She is on the forefront of hair follicle neogenesis, or lab grown hair using human 3D laser printed skin equivalents as the media. Her hope for the future is to "bring the 3D skin to life," and to introduce structures such as vasculature, innervation, sensation, sweating, and other cell types into the 3D skin such that it becomes a living, breathing tissue. She also reported on the remarkable results of treating alopecia areata with janus kinase inhibitors (JAK). These studies have opened significant new understandings of the pathogenesis and mechanisms of treatment for AA that also may bring advances in treating other types of alopecia. She did note that these drugs carry significant side effect profiles that do not make them useful in their current formulations for wide therapeutic use.

The popular "Open Debate" panel, the final session in the General Session lecture hall.

Special Consideration Topics I: The next topic was moderated by Dr. Robin Unger. Dr. Satya Saraswat started the session by reviewing how to harvest a strip emphasizing blunt dissection techniques to spare follicles and neurovascular structures. Dr. Joyoti Gupta made several points regarding scalp, beard, and chest hair used in hair restoration

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based upon his study of graft survival in five patients. The approximate range of survival was 50-70%, 60-80%, and 42-57%, respectively.

Dr. Ken Williams showed video highlights of best practices and harvesting strategies with FUE. His major points were that extraction of follicles outside of the safe donor area has led to unaesthetic outcomes such as over-harvesting and depletion of the donor area. The FUE Robot (ARTAS®) is not a beginner tool to harvest grafts. The physician must be knowledgeable and involved in doing all of the harvesting.

Attributes of the hybrid/flat punch invented by Dr. Jean Devroye were reviewed by Dr. Arthur Tykocinski. He discussed the mechanisms involved with this novel device. This punch features a smooth inner edge, which minimizes the risk of cutting follicles, and a 90° outer cutting edge. It dissects as it oscillates.


Featured Guest Speaker Aline Donati discussing Frontal Fibrosing Alopecia.

Lunch Symposium—Frontal Fibrosing Alopecia: Dr. Francisco Jimenez moderated this session and featured speaker Dr. Aline Donati gave an insightful lecture on frontal fibrosing alopecia (FFA), which has been increasing in incidence worldwide. When the patient is in the later stages of FFA, there are limited options, and unfortunately, transplant is not one of them. In early stages, the surgeon should look for subtle clues to make the diagnosis, such as the absence of vellus hair, which is one of the earliest clues to an FFA diagnosis. Others include eyebrow loss, which is seen in 80% of patients with FFA, and the presence of facial papules, which is seen in about one-third of patients. The appearance of lichen planus pigmentosa (a hyperpigmentation of the face) is less common but is also a clue to diagnosis. Dr. Donati emphasized the role of routine dermoscopy in scalp examination. Treatment includes dutasteride, anti malarials, tetracycline, topical steroids, calcineurin inhibitors, and minoxidil.

Special Consideration Topics II: Key points expressed by Dr. Paul McAndrews, the moderator for this session, included using as little of the hair bank as possible to accomplish the patient's goal, using technologies that ensure that the highest percentage of grafts will grow, and not hesitating to use medical therapies such as finasteride and minoxidil.

Dr. Alex Ginzburg presented the interesting case of identical twins, one of whom wished to have a hair transplant. After 8 months, when hair grew in the first identical twin, it made him look much younger than the other. The older appearing twin wanted to remain a match to his much younger appearing twin brother, so he too sought to have the same procedure. In the end, both twins were happy because they were again a matching pair.

Dr. Mohammad Mohmand reported on a relevant trend regarding FUE. He stated we need to take into account the natural thinning out of the donor permanent zone as patients age. He discussed the impact of the follicular unit donor area and the prediction of severity of donor depletion in the years to come. His final comment was that a good and balanced hair restoration surgeon should know both methods—FUT and FUE.

Dr. Parsa Mohebi advocated for a serial extraction and placement technique that reduces the out-of-body time of the grafts. This technique includes a chasing method in which a technician closely follows the surgeon and removes the grafts so that the surgeon can continuously extract as the tech removes the grafts.

Dr. Sheldon Kabaker showed a video on women with high hairlines. He was able to move the hairline as far as 3cm down with hairline advancement using the Endotine device. The device is a dissolvable polyglycolic acid tack that holds the scalp forward rather than pulling the forehead upward thereby relieving tension on the new hairline. In the last presentation, scalp flap design was reviewed. Dr. Fernando Basto presented a case of head injury with wound dehiscence after dressing was found left behind in the wound. Scalp closure was accomplished with a flap after removal of the retained dressing. Knowing the anatomy, vascularization, and innervation of the scalp is essential to creating the ideal flap to cover the defect and increase the chances of success.

Open Debate: In this segment with the experts, there was a robust discussion of controversies concerning hair restoration. Much of the discussion focused on defining the limitations of donor harvesting with the FUE technique. Members of the panel were not able to agree on numerical limitations, such as the maximum number of harvestable grafts or how much hair could be taken before harvesting would become visible. These limits vary among patients because of differences in hair texture, caliber, density, and skin type. However, there did seem to be agreement that with extensive FUE harvesting the majority of patients would need to grow their hair longer to conceal evidence of surgery.

Live Patient Viewing: The live patient viewing showcased patients following a hair transplant. Excellent results were shown by Drs. Hyun-Wook Baik, Alan Bauman, Michael Beehner, Shady El-Maghraby, Robert Haber, Ken Williams, William Rassman, Marwan Safi, Ron Shapiro, and Tseng-Kuo Shiao.

ISHRS General Business Meeting and Service Awards

Victoria Ceh, MPA, ISHRS USA

The General Membership Business Meeting was called to order by President Dr. Kuniyoshi Yagyu. After the approval of the minutes from the last meeting, Dr. Yagyu reviewed key points from his president's message.

Dr. Ken Washenik, Vice President, then reviewed plans for his term as president including the 2017 World Congress and World Live Surgery Workshop.

The Chairs of the 2017 World Congress and LSW, Drs. Jean Devroye, Arthur Tykocinski, and Jerzy Kolasinski, each made remarks and videos were shown about Prague and Polanica Zdroj. Dr. Sungjoo (Tommy) Hwang presented the Secretary's report noting there are 1,100 members coming from 68 countries, and 66% of the membership is non-U.S. He reported that 137 members were dropped for non-payment of dues, and 120 new members were welcomed into the Society. Having met the criteria, he reported that 11 new FISHRS were accepted at the recent Board of Governors meeting. Dr. Tykocinski presented the Treasurer's report indicating total assets are at $3.2 million. He noted the planned annual operating losses are purposeful in an effort to give back more to the members.

Dr. Yagyu presided over the elections. The membership unanimously approved Dr. Sungjoo Hwang for Vice President (1-year term), Dr. Francisco Jimenez for Secretary (2-year term), Drs. James Harris and Melvin Mayer for Board of Governors (2nd 3-year terms), and Drs. Kapil Dua and Marcelo Pitchon for Board of Governors (1st 3-year terms). Dr. Washenik explained the proposed Bylaws amendments, which the membership approved. Dr. Yagyu presented outgoing board and officer plaques, special service awards, and plaques to the World Congress Planning Committee and technicians who helped on the Course Prep Team.◆

WORKSHOPS

FUE—Basic Concepts

Peter J. Panagotacos, MD USA

Dr. Ken Williams has done it again as workshop director on the basic principles of FUE, mentioning all the methods available today to a novice. His recommendation is to start with the standard manual 1mm sharp punch but also to experiment with the blunt and variations thereof. Dr. Alberto Calixto covered anatomy and rationale for the method of harvesting with a punch and his method of doing a procedure. Dr. Georgios Zontos covered anesthesia with tumescence as well as his techniques in harvesting with an admonition to avoid overharvesting. Dr. Ken Williams explained the types of holding solutions used, the role of PRP, and his method of harvesting and placement. Although the title of the course would imply the information was only for beginners, I was impressed with the amount of well-thought-out pearls that were presented and that I will put to use when I return to my practice.

New Devices for FUE

Francisco Jimenez, MD, FISHRS Spain

This workshop was directed by Dr. Roberto Trivellini. In it, we realized that the duality of sharp vs. blunt punch is coming to an end. Other types of punches are currently in development that offer different solutions to avoid the most critical aspect of FUE failure: graft transection.

The first speaker was Dr. Conradin Von Albertini who showed a video demonstrating FU extraction using a sharp serrated punch and the automated device PCID from Cole Instruments. He stressed that this device is precise, fast, and gentle. He noted that he normally performs several phases of extraction and implantation with the goal of not leaving the tissue out of the body for more than 2 hours. The speed of his extractions is approximately 800-1,000 grafts per hour.

Dr. Jean Devroye showed his "trumpet" punch, a device that he has developed and commercialized. According to Dr. Devroye, the flat surface of the punch decreases the transection rate and its deep penetration allows the physician to obtain fat chubby grafts. The punch works in oscillation mode, which Dr. Devroye considers to be important, and the oscillation speed is controlled by a foot pedal.

Dr. Sanusi Umar presented a video on two punches: the UPunch rotor for head and body FUE and UPunch Curl for tightly curled Afro-textured hair FUE. The tips of these punches are designed to avoid transection in difficult body and curly hair harvesting.

Dr. Luis Trivellini presented an animated video showing the different physical forces that act when a punch is introduced into the skin: axial force, reaction force, tangential, friction, lubrication, etc. He showed his latest punch design, which is a sharp punch with a ring bulging shape that allows tissue dissection while the punch is penetrating into the tissue. This was an interesting concept that should be further explored.

Dr. Jim Harris presented his blunt Hex punch, which has a blunt tip with a hexagonal body that, when it rotates into the tissue, produces vibration and tissue dissection. With blunt punches, it is important to first engage the punch onto the skin and then introduce the punch all the way.

Dr. T.K. Shiao showed the so-called 4D-FUE device, an interesting new concept in which it is the handle that advances the punch into the skin and not the surgeon's hand, avoiding possible errors due to hand/wrist movements. He emphasized that this device has a short learning curve. Apparently, any metal punch can be introduced in his device, which will be commercialized shortly.

Finally, Dr. Alex Ginzburg showed the advantages of using a cordless automatic device, which is operated by battery and is power controlled by the finger.

Beard and Eyebrow Reconstruction and Harvesting

Jonathan Ballon, MD, FISHRS USA

Drs. Bob True and Sara Wasserbauer served as course directors for this outstanding session that addressed the growing demand for eyebrow and facial hair restoration. They were assisted by a first-rate faculty consisting of Drs. Marie Schaumback, Ozgur Oztan, Damkerng Pathomvanich, and Marc Dauer.

For beard transplants, the following topics were covered:

- Review of relevant facial anatomy
- Anesthetic technique
- The technical challenges of harvesting, apportioning, and implanting hair from the submandibular area—which can yield as many as 3,000-5,000 grafts—for use elsewhere in the beard and/or to augment the conventional donor area when performing hair transplantation on the scalp (e.g., Norwood VI and VII patients, repair cases with depleted donor areas, and younger men with unpredictable future loss)
- Selection of appropriate candidates
- Beard design and planning, with guidelines for appropriate number of grafts and tips on implanting

For eyebrow transplants, the following topics were covered:

- Selection of candidates and the importance of setting realistic expectations
- Review of variations in eyebrow shape depending on ethnicity and gender
- The importance of shape in properly framing the face
- FUT vs. strip, scalp hair vs. body hair, single-hair grafts vs. a combination of single-hair and double-hair grafts
- How to achieve a natural appearance using proper angles, directions, and cross-hatching, as well as making rotational adjustments (importance of leaving hair 4-5mm long to ensure that grafts are placed curve down)
- Use of your best techs, and the same tech to place both eyebrows
- Optimal grooming methods for taming unruly growth

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In addition, attendees were encouraged to review the July/August 2015 issue (Volume 25, Number 4) of *Hair Transplant Forum International,* which was dedicated to beard harvesting and restoration.

Implanters

Flavia Barsali, MD Portugal

The Implanters Workshop was a very interesting event where the speakers shared their experience using implanters. Among the speakers were Drs. James Harris, Sungjoo (Tommy) Hwang, Maria Angélica Muricy, and Mauro Speranzini.

Although each speaker had different preferences regarding the sharpness of the implanters, all were in agreement that the use of implanters in hair restoration surgery was beneficial.

The panel concluded that the use of implanters reduces the surgical time, allows for better control of the insertion angle, and generates less trauma to the follicular unit (and consequently higher graft survival). In addition, the learning curve for changing to implanters was shorter in comparison with the use of forceps.

Interesting comments were made regarding the orientation of the implanter when inserting, for example, that with the bevel down, it was easier to match the way the site was made. Also noted was that by adjusting the length of the implanter needle according to the graft length, pitting and folliculitis might be avoided.

The speakers noted a disadvantage of the use of implanters is that only the surgeon can do the insertion if using sharp needle implanters; however, delegation to assistants is possible when using dull needle implanters into premade sites.

FUE—Advanced Topics

Paul C. Cotterill, MD, FISHRS USA

Dr. Jim Harris was the course director for this very popular FUE Advanced Topics workshop. Dr. Márcio Crisóstomo stressed that with the increasing popularity of FUE alone procedures, there has been a concern about not protecting the donor area due to overharvesting in an attempt to achieve the graft numbers that are more readily achievable via strip excision. Dr. Crisóstomo related the importance of being able to know how to properly perform combined FUE and strip procedures in an attempt to maximize on graft yields without depleting the donor area or extending into the non-permanent donor zone especially for the severely balding patients. A combination strip/FUE technique was demonstrated.

Proper FUE extraction has its own distinct challenges. Conservation of the donor area without over harvesting is a prime concern. Dr. Jean Devroye explained and illustrated the proper assessment of the donor area utilizing proper magnification, with an eye toward how to best manage the donor area, how many grafts can be removed safely, and what the best pattern is to avoid a moth eaten appearance and to avoid micro vascular damage. Some tricks he suggested were to avoid extracting adjacent FUs, to avoid a too-regular pattern, and to always use only the permanent donor area.

Dr. Sanusi Umar's first lecture dealt with his experience on body hair transplantation, including what to avoid and how to approach body hair FUE. He noted that because body hair is very delicate, you should avoid back hair and avoid any technique that struggles to extract grafts. Because of limitations with the standard rotary FUE punches, Dr. Umar developed a curvilinear textured punch that has a fluid integrated system that flushes the punch to minimize graft damage during forceps extraction of the graft. The Afro textured haired patient is particularly challenging for the removal of intact grafts due to the severe curl of the hair under the skin. For his second lecture, Dr. Umar demonstrated his design and use of a non-rotary curved punch that, when properly positioned and then plunged into the skin, allows for a safe direction change that allows a type of scooping/separation of the graft from its bed. For him, this results in a less than 5% transection rate.

Dr. Jim Harris finished the workshop by demonstrating how to improve and gain efficiency with FUE surgery. Important aspects were appropriate magnification, proper hair length for removal of the FUE grafts, physician comfort, and proper overall planning. With the advent of larger sessions, an efficient plan needs to be established utilizing the physician's removal sequence and easy access for assistants to remove the physician cut grafts in a consistent and streamlined sequence. Dr. Harris explained that while he is doing an FUE session, he gets into a Zen mood where he is able to block out surrounding stimuli while using an internal mantra for each dissection employing a consistent sequence of skin tension, align punch, engage, advance.

All-in-all, the presenters shared many helpful and important pearls.

PRP for Hair Restoration

Kongkiat Laorwong, MD, FISHRS Thailand

What is Platelet Rich Plasma (PRP)? Normal platelet counts in blood range between 150,000-350,000/mcl and average about 200,000/mcl. PRP is a volume of plasma that has a platelet concentration 4× above baseline at 5ml or 1,000,000/mcl. (See table.)

Growth Factors	Area	Effect
PDGF (Platelet Derived Growth Factor)	Epithelium cells and sebaceous glands of hair follicles	Hair canal formation; Stimulates the growth of dermal mesenchyme
VEGF (Vascular Endothelial Growth Factor)	Vascular plexus in dermal papilla	Improve follicle vascularization
EGF (Epithelial Growth Factor)	Epithelial cells and Fibroblast	Stimulates mitosis on epithelial cells and fibroblast; Improves the ratio of anagen; Inhibits the entry in catagen phase
IGF 1 (Insulin Like Growth Factor)	Keratinocytes	Slows down apoptosis
FGF (Fibroblast Growth Factor)	Keratinocytes and endothelial cells	Stimulates the proliferation and differentiation of keratinocyte and endothelial cells; Promotes the anagen phase
NGF (Nerve Growth Factor)	Perifollicular neurogenic	Stimulates strongly hair growth and slows down apoptosis; Acts as stress-mediator

Absolute contraindications for PRP injection:

- Platelet dysfunction syndrome
- Critical thrombocytopenia
- Hypofibrinogenemia
- Hemodynamic instability
- Septicemia
- Sensitivity to bovine thrombin (if using it with calcium to make platelet gel)

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Application of PRP in hair loss (non-surgical):

- It can be used as an adjunctive therapy to complement therapies such as finasteride, minoxidil lotion, or LLLT in androgenetic alopecia (male and female).
- It can be used if patients refuse traditional therapy or have negative side effects.
- It can be used as an adjunctive therapy for alopecia areata or scarring alopecia (for hair maintenance).
- It is safe because it is from autologous blood.
- Intervals of injections vary, average 4-6 months; clinical evaluation should be considered.
- Additives or stem cells in PRP may be added: ACell MicroMatrix, amniotic extracellular matrix, adipose tissue, stem cells from bone marrow aspirate (BMA)

Protocol (may vary among facilities):

- The blood is drawn and prepared with the PRP device.
- The scalp is anesthetized with a ring block.
- The PRP is injected first, then PPP is injected or topically applied next.
- The stimulate is activated with micro-needling or other agents.

Bio-enhancement in hair restoration surgery does the following:

- Enhances wound healing.
- Diminishes scarring.
- Grows hair sooner and denser.
- Modifies or slows down hair miniaturization in non-transplanted hair.
- Minimizes post-op shock loss of at-risk, non-transplanted hair.
- Improves the character of hair.

It was also noted that it is still questionable whether graft holding solutions improve graft survival. In addition, some doctors inject PRP before making recipient sites, and some inject after all grafts are placed.

There are variations of preparation, so the active growth factors and their concentrations varies. The following are benchmarks for choosing the PRP device:

- Ease of use, preparation time, PRP concentration
- PRP volume per kit/tube
- Cost per ml of PRP produced
- Whether FDA approved for PRP production
- Features: adjustable concentration of PRP, ability to process different sample size

Medical Management for Male and Female Pattern Hair Loss

Alex Ginzburg, MD, FISHRS Israel

This was a sold-out course, with about 60 participants. The first talk was by Dr. Rodney Sinclair, a dermatologist from Sydney, Australia, and one of the most renowned experts in hair. He presented a case of a woman with female pattern hair loss (FPHL) and noted which tests and blood analysis are necessary for a complete evaluation. He offered possible treatments such as the following:

1. Antiandrogens (Spironolactone 200mg a day and Cyproterone 100mg for 10 days a month) and local treatment with minoxidil 2% and/or 5% to stimulate hair growth
2. 5-alpha reductase inhibitors (finasteride 5mg/day, dutasteride 0.5mg/day, flutamide 250mg/day, or bicalutamide (these last two require careful monitoring of liver function)
3. Other options are oral minoxidil 0.25mg/day, bimatoprost, platelet-rich plasma (PRP), Laser Comb etc.

The second talk, by Dr. Nicole Rogers, was entitled "What's New in Male Pattern Hair Loss." Dr. Rogers reviewed FDA-approved therapies for MPHL (topical minoxidil, oral finasteride), discussed FDA-cleared therapies for MPHL (low-level light therapy and PRP), and considered off-label medical therapies for MPHL (dutasteride, ketoconazol shampoo). She also explained the side effects of finasteride and botanical treatments for hair loss such as pumpkin seed oil, saw palmetto, sophora flavescens, and procyanidin.

The third talk, by Dr. Aline Donati, was on the diagnostic and treatment of cicatricial alopecias. She recommended to always do biopsies in cicatricial alopecias. For LPP, antimalarials is the drug of choice, but cyclosporine, tetracyclines, and local corticosteroids also can be beneficial. For frontal fibrosing alopecia (FFA), antimalarials, tetracyclines, dutasteride, finasteride, minoxidil and topical corticosteroids are therapeutic options. For folliculitis decalvans, treatment options include rifampicin and clindamycin, as well as dapsone, corticosteroids, isotretinoids and zinc, topical corticosteroids, and laser epilation. For discoid lupus erythematosus (DLE), treatment choices include antimalarials, topical and intralesional corticosteroids, and calcineurin inhibitors for facial involvement.

The last talk, by Dr. Ken Washenik, was on the emerging therapies in AGA. Prostaglandin F2 (latanoprost) used eye drops for glaucoma increased eyelash growth in 77%, bimatoprost 0.3% is approved as a stimulator of eyelash growth. There is a phase III trial of prostaglandins for treatment of AGA, and it did not yield suitable hair growth. In phase II clinical trial, topical applied cortexolone 17-alpha propionate (Breezula) and androgen receptor blocker showed promising results.

A phase II multicenter randomized, blinded trial is underway using enzymatically prepared stromal vascular factor of enriched adipose cells in treatment of AGA in men and women.

JAK inhibitors seem to work in alopecia areata; JAK inhibitors promote hair growth. Adipose lineage stem cells support the follicular stem cell niche and the hair growth cycle.

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Hairline Design and Recipient Area Planning

Chiara Insalaco, MD, PhD Italy

Drs. Arthur Tykocinski, course director, Ron Shapiro, and Robin Unger were hosts of this workshop, which was suitable for all levels of experience and knowledge and highlighted the conservative and natural approach to hairline design and also to the planning of the recipient area.

The message of the faculty was straightforward and especially beneficial to less experienced hair restoration surgeons: Inexperience ensures that mistakes occur. We must all learn from our mistakes, but it is far better to avoid mistakes by learning from those who have made errors in judgment over the course of decades, yet overcame them through wisdom and modification in technique. Sage advice concerning hairlines applies in particular to young patients where low hairlines become unacceptable as hair loss progresses over time.

The faculty presented numerous cases of patients, some with exceptional hairline and recipient area planning, and others with poor design and philosophy.

Each colleague presented his or her personal approach to the hairline and recipient area. Dr. Tykocinski explained that when he creates the hairline and recipient area design at first, he looks at the overall design of the face, so he can choose the best design based on the shape of the face. Afterward, he takes care of the details of the hair restoration. To him, facial proportion is imperative; he always follows the natural shape of the forehead bone keeping in mind the physical design of the patient. He suggested to build up the hairline where there is the transition point from the vertical to the horizontal shape of the forehead. The shape of the hairline has to match the form of the face.

Dr. Tykocinski said that the primary goal for the design is not a packed hairline. Rather, more important is the natural direction of the hair. Also, the tip of the temporal point has to be thinner and irregular with an incision angle of 10°. He wants a higher density in the area behind the hairline. He noted that the crown is the most challenging area. For this reason, he suggested that we make the center thicker and the periphery thinner, imagining the worst-case scenario for the future of the patient to plan the design carefully and study well the donor area bank.

Dr. Unger talked about the overall distribution. Dr. Unger's motto is "making less look more." Indeed, her suggestions are to give the illusion of density. She emphasized the concept that the donor area reserve is limited and we can't use it unconsciously. She suggested that we study the case and have a long-term perspective, in particular in young patients for whom future hair loss can be unpredictable. In her opinion, the primary goal is to have the look of density in the whole area and not just in a small area.

Dr. Unger stressed the importance of the vertex, hairline, and peripheral regions. She explained that dense packing should not to be our primary goal as it can have the disadvantage of poor growth. Instead, it's more important to follow the angle and direction of the existing hair, and to place single follicular units at different densities and multiple follicles at various densities to create a density gradient for an optimal result. In patients with no donor area because of previous hair surgeries, she notes it's far more important "to make the grafts count than to reach a graft count."

Dr. Unger introduced other kinds of camouflage techniques to make less look like more, such as scalp micropigmentation (SMP). She noted that SMP can help to create the illusion of fullness, spread out in the sparse areas. SMP is better where there is hair rather than in completely bald areas, and she preferentially chooses a semi-permanent SMP. In women, she suggested always to ensure patients are aware of the issue of shock loss. For this reason, she doesn't use adrenaline in female hair restoration.

Dr. Shapiro presented a detailed PowerPoint presentation showing how we should create a natural hairline and recipient area. He explained the difference between the past, when very unnatural transplanted hairlines were very common because of the use of big and pluggy grafts in the first line, and today's tendency to create a natural hairline using 1- to 2-hair grafts so they can be virtually undetectable. But it isn't enough. Specific skills are needed to locate and draw appropriate borders and mimic natural characteristics of the hairline at these boundaries. He showed how to build a natural hairline, beginning with the Transition Zone (0.5-1cm) where he suggested to place 1-hair grafts. In this zone, we need to create micro and macro irregularity. The Defined Zone is denser with 2-hair FUs, making the hairline look fuller without making it too straight or abrupt. The Frontal Tuft is a paramount area with a higher density creating a substantial impact on the appearance of fullness.

Dr. Shapiro also explained the importance of locating the frontotemporal angle, usually in the anterior sideburn line or lateral epicanthal line, and the temporal point that he likes with a smooth slope, with coronal incisions parallel to existing miniaturized hair at 10-15°.

Dr. Shapiro treats patients like they have lost most of their hair; he always thinks about the future. He emphasized that the conservative approach always looks good, and there is always time to improve and to come back to make the result thicker. We don't need a super density hair restoration, above all in young patients.

To me, this workshop is one of the most valuable seminars, in particular for the novice. Recently, there has been more attention given to the technique of harvesting grafts and less attention to the correct design of the recipient area and hairline. Attention to all aspects of the hair restoration procedure are necessary, but the hairline and recipient areas are our signatures.

There were many takeaways given by the faculty: Be wise and responsible when moving forward with the patients. Never be in a rush to create a super-packed recipient area. Study the donor area well. Always consider the age of the patient. Always create a natural style. Say no to the young patient who asks for a very low hairline, while educating them about the pitfalls of such aggressive hairlines.

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Avoiding Poor Technique, Poor Planning, Poor Growth, and Bad Results

Emorane C. Lupanzula, MD Belgium

This workshop was directed by Dr. Robert Haber and supported by faculty members Drs. Bessam Farjo, Russell Knudsen, and William Rassman. Based on their personal experience, this faculty presented some tips on how to maximize the chances of success when performing FUT and/or FUE.

FUE currently represents 48% of the market. It is driven by the rapid expansion of providers, consumers wishing to avoid a linear scar, patients who are too young for FUT, and by a technology that requires less labor and less cost. Nevertheless, there is too much attention focused on the FUE technology and not enough attention focused on the quality of graft production and final results.

The following topics were highlights of this workshop:

Strip harvesting: The ideal location is not too high or too low, and the donor area should be preserved by avoiding vascular and nerve damage. The safe donor zone should be clearly defined prior to the surgery. The surgeon has to be conservative and should consider that young patients are the most difficult to assess. Transection should be avoided by using appropriate magnification knowing that slivering is the most critical step. In performing donor closure, the doctor should assess flexibility in at least 3 places before starting. It is better to take a longer and thinner strip rather than a shorter and wider one. Closure tension should be minimal. A tight closure will be managed by using undermining if needed (approximately 1cm each side), using mechanical creep with tension clamps (wait 60 minutes), letting the tumescence settle before closure, and allowing partial closure with secondary healing if required.

Trichophytic closure is not a compensation for a bad technique. The physician should be attentive to alignment when closing. A better technique is to avoid harvesting from lower a donor zone where there are acute direction and angulation changes. Staples and/or anchor sutures for closure should align hairs as closely as possible. During closing, sliding the upper and lower wound edges to either side helps to match localized hair direction.

The aesthetic appearance of the donor scar depends on the following factors: incision location, degree of hair transection, alignment of hairs and skin edges, closing material used (staples, sutures, combination), tension on the wound, and tension of the closure. Pre-existing conditions can also influence the aesthetic appearance, such as hair color, race, and patient healing characteristics, as well as previous surgical intervention.

FUE donor management: The safe zone is difficult to define. The physician should consider retrograde alopecia when extracting since nobody can really tell who and when someone will be a class VII! The total transection rate should be ideally less than 5%, and the partial transection rate should be less than 15%. The transection rate is related to the punch size, depth, angulation, and using a sharp or dull edge, and depends on the skill and experience of the operator. It is important to adjust punch depth and size with a goal to minimize transection, to maximize the hair per graft ratio, to minimize visible scar formation, and to extract grafts with less mechanical strain. Traumatic removal causes pulling off or cutting off of critical elements of the graft anatomy. The transection rate may reflect collagen characteristics of the dermis, which impacts the ease or difficulty of graft extraction.

It is essential to avoid inappropriate graft extraction, such as pulling too fast or too slow and pulling in the wrong direction. The quality of the instruments used for removing grafts should be carefully chosen and controlled.

Another major hidden problem is how to preserve a donor area without damage. This issue should be addressed thoroughly when planning FUE megasessions as donor area depletion is commonly seen with these very large single session harvests as well as vascular damage, excessive scarring, and increased risk of necrosis.

Dehydration: Dehydration is one of the most damaging factors to hair follicles. The surgeon has to consider room humidity and heating and air-conditioning. Be aware of the time grafts spend on gloved fingers during placement. Dehydration can be avoided by avoiding exposure to air of more than 10 seconds (the 10-second rule). If slivering during FUT, avoid dehydration by always covering the strip with wet gauze. Graft quality depends on the operator's experience, and several technical factors including the out-of-body time, the desiccation, the technology (different instruments), the use of sharp, dull, or serrated punch, rotation, vibration, and sub-dermal tumescence.

Growth enhancers: This includes PRP, ACell, ATP, and LLLT, none of which can overcome a poor technique.

Staff issues: The surgeon should establish a culture focused on creating a high-quality patient experience and should know that the enemy of the office is jealousy and infighting, which always impact patient care. There should be a zero-tolerance policy with regards to negative discussion in the operating room, and all personal discussion should be avoided. Every staff member contributes to the whole of the patient experience and the doctor's job is to implement this mantra.

The training of the staff should focus on the quality based on avoiding desiccation and trauma when dissecting and planting.

When placing grafts, repetitive trauma should be avoided. It is important to avoid crushing grafts by using low forceps pressure and finding the right position to grip the graft. Considering forceps versus implanters, there is a vast difference in the learning curves; it takes 6 months to get highly skilled with the forceps and only days with the implanters. Another advantage of the implanter is less tissue handling. To avoid the planting trauma, the surgeon should also create bigger recipient sites for beginners and consider that FUE grafts have less tissue than microscopically dissected grafts.

The doctor should think about the staff comfort: masks, protective eye wear, and beware of "tunnel vision." Because of the repetitive nature of tasks, regular supervision, rotation, and regular breaks should be planned.

The staff should focus on the quality and not on the quantity as "it's a beauty contest, not a race."

Master plan: Dr. Rassman said that the "doctor's ego is the enemy of the patient." During the pre-op consultation, there should

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be a focus on the future while planning the day's surgery. Where is the patient on the hair loss time line? The balance between donor and recipient area should be considered with every patient and in every surgery. Planning a scalp micropigmentation (tricopigmentation) should be an option discussed with the patient.

Physician involvement: Does the surgeon need to learn FUE technology or hire a team with or without medical control? How about the ARTAS®? How long does it take for a surgeon to master FUE? Competence requires good training and time.

Post-op care management: This is the step where the patient is in control. The patient should be well coached to follow the appropriate post-op care instructions with little room for error. The final result depends on the patient's ability to follow the physician's instructions.

The faculty also discussed ARTAS and showed its limitations with mechanical failures that can occur, such as missing harvest attempts, complications when working with very curly or white hair, high transection rates, slower speed than manual FUE, and increased graft out-of-body time. Longer surgeries with the ARTAS require better organization.

Until FUE produces graft quality comparable to FUT on a consistent basis, strip surgery should still be a patient option. There are many steps in the procedure where something can go wrong, and the surgeon and the staff must remain attentive and meticulous.

Non-Medical Treatments: The Surgical Assistants Role in LLLT, SMP, Camouflage, PRP, and Medications

Sara Roberts, RN United Kingdom

The aim of this workshop was to understand what role assistants play in non-medical treatments. The program consisted of 5 presentations on non-surgical treatments used in hair restoration surgery. Brandi Burgess began with a succinct overview of PRP. She explained different devices and different protocols, and looked at PRP as a complementary therapy to other non-surgical treatments. Next, Holly Grodzik covered how the surgical assistant could be involved in LLLT; she emphasized the importance of the assistant knowing how to answer questions that patients may have about this form of treatment once it has been recommended by a physician.

The next presentation focused on scalp micropigmentation (SMP). Nicole Large gave a clear overview of the pros and cons of SMP and showed case studies of the different ways SMP can be used to help patients. Aileen Ulrich coached the audience through the different medications that physicians may prescribe and explained the administration and side effects of both minoxidil and finasteride. The final presentation was about the different camouflage agents that a patient can use either as a solution to hair loss or thinning or to use in the days post-procedure.

The take-home message for this workshop was how important it is for the surgical assistant to be well educated on these forms of non-surgical treatments in order to help educate patients and reinforce the doctor's recommendations.◆

EXTRA COURSES

Basics Course

Angeline Anning Yong, MBBS Singapore

A full-day Basics Course was held on the day before the ISHRS World Congress. This course was directed by Drs. Gregory Williams and Mauro Speranzini and kicked off with a series of introductory didactic lectures by a panel of distinguished faculty. The morning lectures covered various key aspects of hair transplantation surgery, which should be understood by all physicians beginning their journey as hair restoration surgeons. These lectures covered various essential topics such as the differential diagnosis of hair loss, anatomical landmarks in hair transplantation, and anesthesia, as well as an overview on both the strip FUT and FUE. This ensured that there was adequate theoretical knowledge before the afternoon hands-on workshop as many of the attendees were new to the field of hair restoration surgery.

Although I found the lectures to be very informative and well-delivered, the highlight of the workshop was the hands-on work station rotations that gave attendees focused, personal guidance by experienced faculty and covered key core concepts such as hairline and crown design, strip harvesting procedure, FUE harvesting (utilizing manual FUE punch as well as various motorized FUE punch devices), and recipient site making and graft placing using both forceps and implanters. It even comprehensively covered strip FUT graft preparation such as slivering and dissecting grafts under microscopes. Because attendees were broken up into small groups of 4-5 people, participants had a lot of opportunity to interact with the faculty, enabling them to learn under close supervision and guidance and to pick up various tips and pearls from the experts. Most of the participants left the Basics Course feeling more confident and well-equipped after a great overview of hair transplantation.

EXTRA COURSES

Surgical Assistants Program

Sara Roberts, RN United Kingdom

This year's Surgical Assistants Program took place on Wednesday, September 28. The program was geared towards all levels of experience and was structured in such a way that the presentations began with the basic concepts that would develop the skills of someone new to the field. As the program moved along, the topics and discussions became more advanced, encouraging more engaged learning and the opportunity for questions and answers.

The program began with a general overview of the learning objectives and a brief history of hair transplantation. There was a concise presentation by Arita Kastrati on the anatomy and physiology of the hair and scalp. Following this, the basic principles of graft preparation and graft placement were explained by Aileen Ulrich and Tina Lardner, respectively. The middle section of the program allowed the novice assistant to hear directly from physicians what is required from them during an FUT or FUE procedure. Drs. Bessam Farjo and Ken Williams showed video footage of how their technicians aid them during a procedure. Dr. Russell Knudsen gave insight with his presentation on ergonomics into the implications of fatigue and poor ergonomics on the morale of the team and how this can affect the overall procedure for staff and the patient. Peter Gaido, ISHRS legal counsel, informed the audience on the implications and legal limitations of the assistant's role. Brandi Burgess ended this section of the program with a detailed talk on the science of graft preservation.

The final section of the program consisted of three separate panels of experts. The panels answered questions on the following subjects: complications of surgery, quality control/ infection control, and staff training. This section of the program was extremely dynamic and allowed open discussion amongst the panel and audience.

Surgical Assistants Core Skills Workshop

Emina Vance USA

This year's Surgical Assistants Core Skills Workshop organized topics into five stations and the students rotated from station to station, learning the core skills in tissue and graft handling. Four stations offered hands-on practice on slivering, graft dissection, graft placement, graft removal, and use of implanters. The fifth station was a sit-down, ask-the-expert station allowing students to ask questions and connect the dots to a better understanding of their role.

The stations were set up to provide students with the opportunity to try different instruments and various techniques. This year, we replaced the tissue with new synthetic models; both students and faculty responded well to them. When using cadaver tissue in the past, faculty was expending time and energy explaining that the real tissue may look like cadaver tissue but it feels different, which in turn probably confused the students. This year, it was obvious that the models only represented the real tissue making it easier on everyone to put their efforts into learning the techniques. Furthermore, using synthetic models made setting up and cleaning up after the workshop faster and easier.

Based on their comments, students learned not only the fundamentals, such as how to use a microscope, hold instruments, or have a proper technique of graft dissection, but also how to recognize when the blade was dull or when hand movements were inefficient. Thanks to the knowledgeable and dedicated faculty, we were able to teach a lot in a short period of time, and hearing students' excitement and feedback at the end of the workshop was very rewarding.

Advanced/Board Review Course

Alan Bauman, MD, FISHRS USA

Who wants to participate in a nearly 10-hour detailed overview of the most advanced topics and core curriculum in the field of Hair Restoration? Well, if you want to accomplish or maintain the highest certification available in the field armed with the latest information on diagnosis and treatment and be able to call yourself a true "expert," then you certainly should have participated in this year's Advanced/Board Review Course! The Advanced/Board Review Course was a full-day course that reviewed the format of and key concepts tested by the written and oral portions of the ABHRS Certification Exam. Program Chairs Drs. Marco Barusco and Bernard Arocha compiled a comprehensive program of the 10 major content categories, including recent important updates to the ISHRS Basic Lecture Series benefiting both new ABHRS candidates and those seeking recertification.

Highlights included Ethical Guidelines from Dr. Dan McGrath, an overview of hereditary and other alopecias by Dr. Ricardo Mejia, how to execute a hair loss consultation and medical evaluation by Dr. Robin Unger, strategies for advanced AGA by Dr. Márcio Crisóstomo, the all-important management of emergency situations in hair transplant surgery by Dr. Carlos Puig, and many other high-level topics presented by a renowned faculty. In addition to the didactic portion of the program, there was ample time for interactive Q&A amongst the participants and presenters, as well as online access to the well-produced ISHRS Basic Lecture Series videos. Kudos to Drs. Barusco and Arocha for accomplishing the ambitious goal of providing such a detailed course suitable for both novice and experienced surgeons to enhance and or refresh their knowledge in the fast moving field of hair restoration.

Personally, I would like to add that participating in the Board Review course put me in the ideal mind-set for achieving high performance on the ABHRS recertification exam that same evening!

Newcomers Meeting

Edwin Epstein, MD, FISHRS USA

Dr. Bill Parsley hosted the Newcomers Meeting using a "speed networking," format that allowed newcomers and faculty to sit across from each other. The faculty quickly learned the background and experience of the newcomer, who then had the opportunity to ask various questions of the faculty. The faculty rotated every 3 minutes.

Dr. Parsley started with the history of hair restoration surgery beginning with the single-hair transplants reported in the Japanese literature in the 1940s by Dr. Shoji Okuda and others. Some

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EXTRA COURSES

25 years later, Dr. Norman Orentreich published the use of the 4.5mm punch to treat vitiligo, and subsequently expanded this technique to hair transplantation, demonstrating the concept of donor dominance. He then reviewed the evolution of various techniques from punch grafts, dividing punch grafts into mini and micro graft sizes, strip harvesting, flap and reduction scalp surgery, and the introduction of the microscope by Dr. Bobby Limmer to allow for follicular unit dissection and larger graft sessions by Dr. Carlos Uebel.

The exchange of knowledge in hair restoration surgery initiated in the early 1970s by Dr. Bluford Stough and others set the stage for the creation of the ISHRS by Drs. Dow Stough and O'Tar Norwood. As new techniques evolved, the need existed for more rapid communication, hence the origin of the Hair Transplant Forum.

Dr. Parsley stressed the importance for newcomers to understand the causes and treatments of hair loss, and to be directly involved in not just the surgical process, but to provide for the best interest of the patient. Finally, he reviewed the team effort between physician and assistants, and the primary role of the physician as the surgeon.

FUE Mini Course: Powered Sharp Punch Systems—Shaven and Non-Shaven FUE

Paul T. Rose, MD, JD, FISHRS USA

This course, directed by Dr. Jae Hyun Park accompanied by distinguished faculty Drs. Alex Ginzburg and Otavio Boaventura, was dedicated to powered sharp punch shaven and non-shaven FUE. There was a section on the use of implanters as well.

Dr. Ginzburg began by discussing his use of a cordless powered device for FUE and personal approach to FUE. He related that he favored this type of drill because it is lightweight, inexpensive, uses almost any type of punch, has a fingertip power control, and is easy to use. He stressed the importance of the use of adequate magnification and sufficient lighting, and he indicated that he does not use tumescence with his technique. He also discussed his plan for donor harvesting, which included taking about 60% of the grafts from the occipital area as opposed to the lateral areas.

Dr. Boaventura then presented a very interesting lecture focusing on the mechanics and dynamics of FUE. The possible causes of transection were reviewed and he noted the effects of using different size punches and the use of both sharp and dull punches. He provided what he feels are the characteristics of an "ideal" punch. He pointed out that a 10% change in punch diameter causes a 19% change in area, thus affecting wound size.

Next, Dr. Park spoke about elements of transection and the role of punch diameter, depth of penetration, and the problem of adhesion of grafts to surrounding and underlying tissue. He discussed how shear forces, friction, and torsion affect the FUE process. He emphasized limiting depth of punches, advocated using tumescence to obtain a more vertical angle of the hairs, placing vertical traction on the donor tissue, and the use of an oscillating drill.

A portion of Dr. Park's lecture also covered ergonomics and the physical stresses placed on the physician and patient. He presented his invention of an electric table for more ergonomic harvesting that provides support for the physician's arm and a stabilization device for the patient.

Because some patients are reluctant to shave their head for the FUE process, Drs. Park and Boaventura presented methods to harvest unshaven donor hair. Dr. Park demonstrated his novel "direct" punch technique. Dr. Boaventura presented his recently published surgical approach using his version of a slotted punch. Both noted that these techniques are slower and require more skill than the typical FUE case. Dr. Park related that his transection rate with the direct method is approximately 6-10%, and 5-10% for shaven hair.

The second segment of the course was devoted to graft placement and the use of implanters. Dr. Ginzburg commented on the importance of checking graft size with recipient site blade size because a mismatch can create multiple problems

Dr. Boaventura went on to speak about the fragility of FUE grafts and the possible difficulties of placing them. He reported on the use of appropriate blades for the stick-and-place method he uses.

Drs. Boaventura and Ginzburg's comments were echoed by Dr. Park, who gave a lecture on his approach to implantation and the use of implanters. He showed how he uses depth control implanters that he developed. Dr. Park also discussed the role of epinephrine and the length of time the effects last in various areas of the scalp. He also spoke about the proper loading of the implanter and proper insertion of the device.

Although brief, this course covered a great deal of material and served as an excellent learning experience for the novice and experienced hair surgeon alike.

SMP Mini Courses

Jennifer Krejci, MD USA

Drs. William Rassman and Bessam Farjo presented this workshop. They noted that scalp micropigmentation (SMP) is becoming a more widely accepted tool in the armamentarium of a fully trained hair transplant surgeon. If practicing long enough, we all have strip or FUE scars that could use some help. We all also have those patients who will never have enough donor hair to satisfy their goals purely through hair transplantation. For these patients and those who simply want a shaved head that looks more complete, there is definite role for SMP. Educating ourselves AND our patients on this option is something we should be able to provide even if we choose not to provide the service ourselves.

It is important to know when and where to refer a patient for SMP. Clearly, this cannot be done by the local tattoo parlor that thinks they know how to do SMP. It is as technically challenging as dissecting grafts from a strip and has an equally long learning curve. The technician must be highly skilled and meticulous at very fine motor skills, which also means that there is a high risk

EXTRA COURSES

for overuse injury so having two or three competent technicians is advisable.

Prior to attending this course, I had viewed the procedure firsthand on several patients but never performed it myself, so I had some limited working knowledge of the intricacies of the procedure. Following are the pearls from the workshop that I believe are the crux of SMP:

1. Black diluted to various shades of gray is the pigment of choice for all hair types and inorganic pigments are preferred.
2. Brown or reddish pigments tend to fade to orange and do not look as good regardless of the patient's original hair color.
3. Pigment is deposited 0.5mm into the skin, approximately at the level of the basement membrane. If it is placed too superficial, it will not take. If it is placed too deep, it can migrate or bleed and create a "glob" of pigment or turn blue over time.
4. A 3-needle tip is most often used to produce very fine dots that mimic shaved hair in a pattern termed "stippled pointillism."
5. Angle, depth, and timing of needle, thickness and resistance of scalp, and color and viscosity of pigment are the many factors that must be considered in order to perfect the technique and produce optimum outcomes.
6. Most patients will need 3 sessions at least 1 week apart, however, sessions spaced further apart are also acceptable.
7. When combining FUE/FUT with SMP, wait at least 3 months or more before doing SMP. Waiting longer helps to better define the new growth vs. space for SMP.

I found this course to be very valuable in terms of gaining insight, however, practicing the procedure was not really possible. There were two mannequin heads and two swatches of synthetic skin provided for the 50 or so attendees. Naturally, the mannequin does not behave in any way like human scalp, but I was able to hold the SMP device in my hand and run the foot pedal, a bit like dipping my toe in the water. I truly enjoyed hearing Dr. Rassman's vast experience in this topic as well and Dr. Farjo's personal journey into the world of SMP, and am enthusiastic about potentially providing a new skill in my own office one day.

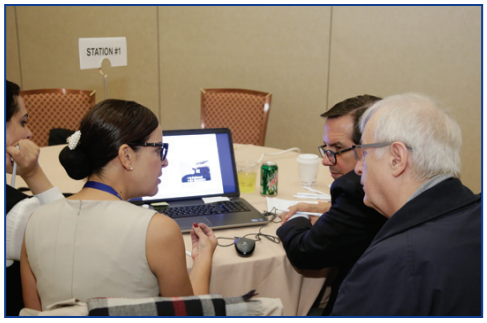
FUE Mini Course: Powered Blunt Punch System for FUE

Kapil Dua, MBBS, MS, FISHRS India

This workshop, led by Dr. Kapil Dua accompanied by Dr. Scott Boden, an experienced teacher on FUE, and Dr. Marc Bishara, a very experienced surgeon with the powered dull FUE, was divided into two parts: 1) didactic lectures, and 2) hands-on training. In the first half, Dr. Dua detailed the technique of extraction with the blunt punch, emphasizing the main steps, alignment, engagement, and advancement of the punch. He also discussed the latest advancements in the dull punch category such as the Hex punch developed by Dr. Jim Harris and the flat punch developed by Dr. Dua.

Dr. Boden discussed how to increase the yield of FUE grafts, which was very helpful for the beginners. Dr. Bishara also discussed the different situations faced by beginners such as how to plan an FUE surgery, how to extract intact grafts, when not to do the FUE surgery, how to train the staff, etc. Dr. Dua then discussed the ergonomics of FUE surgery to increase the efficiency of the procedure.

Next, the delegates were given an opportunity to practice all of the steps of extraction on the beautiful foam models developed by Emina Vance and her team. The faculty moved from table to table of delegates to make sure that all of their questions were answered. One of the main questions from the participants was how many grafts can be extracted by FUE. The faculty shared their experience and there was a unanimity amongst all the surgeons that around 2,000 grafts can be extracted in a single session, and if more are required, then one additional session or maybe another small third session can be carried out if there is adequate donor area present.◆



2016 WORLD CONGRESS PLANNING COMMITTEE

Congratulations to the 2016 World Congress Planning Committee for a most successful meeting!

2016 World Congress Planning Committee

Marcelo Pitchon, MD, Chair
Marco N. Barusco, MD, Advanced/Board Review Course Chair
Bernard A. Arocha, MD, FISHRS, Advanced/Board Review Course Co-Chair
Gregory Williams, MBBS, FISHRS, Basics Course Chair
Mauro Speranzini, MD, Basics Course Co-Chair
Ricardo Gomes de Lemos, MD, Workshops Chair
Márcio Crisóstomo, MD, FISHRS, M&M Conference Chair
Piero Tesauro, MD and TK Shiao, MD, FISHRS, Live Patient Viewing Chair
Tseng-Kuo (TK) Shiao, MD, FISHRS, Live Patient Viewing Co-Chair
William M. Parsley, MD, FISHRS, Newcomers Chair
Sara Roberts, RN, Surgical Assistants Chair
Emina Vance, Surgical Assistants Vice Chair
Nilofer P. Farjo, MBChB, FISHRS, Immediate Past Chair
Narendra G. Patwardhan, MD, Committee Member
Sebastian Yriart, MD, Committee Member
Georgios Zontos, MD, MSc, PhD, Committee Member

Did you miss the recent ISHRS World Congress in Las Vegas? Watch two recorded sessions (no charge) on the ISHRS website, Members Only section!
www.ISHRS.org

THURSDAY, Sept. 29, 2016, 11:00AM–11:45AM
"Current Perspectives in Hair Restoration Surgery"
Speakers: Haber, Rassman, Wolf, R. Shapiro, Devroye

SATURDAY, Oct. 1, 2016, 2:50PM–3:30PM
"Open Debate: Congress's Best Topics Discussion Panel"
Panelists: Wolf, Devroye, Haber, Harris, Limmer, Marzola, McAndrews, True, W. Unger

2016 Course Prep Team

THANK YOU to the 2016 Course Prep Team and their physicians! Tina Lardner of Dr. Jim Harris' office; Roxanna Barajas and Erik Carlson of Dr. Sara Waserbauer's office; Salome Vadachkoria of Dr Vazha Vadachkoria's office; Sara Roberts of Dr. Nilofer Farjo's office; Song Yang of Dr. Ron Shapiro's office; Putrina Figueira of Dr. Nicole Rogers' office; Lil Carr and MaryAnn Parlsey of Dr. William Parsley's office; Kathryn Morgan, Deanne Pawlak, Amy Howe, Marcy Heasman and Wilson Mendoza of Dr. John Gillespie's office; Laurie Gorham of Dr. Ken Washenik's office; Natalia Plenamente of Ricardo Gomes de Lemos' office; Diana Carmona of Dr. Timothy Carman's office; Aileen Ullrich of Dr. Steven Gabel's office; Emina Vance of Dr. Sam Lam's office.

President Dr. Yagyu congratulates Dr. Marcelo Pitchon for his efforts in chairing the 2016 World Congress.

Members of the 2016 World Congress Committee receiving plaques from President Dr. Yagyu and Incoming President Dr. Ken Washenik. *L to R:* Kuniyoshi Yagyu, Nilofer Farjo, Márcio Crisóstomo, Sebastian Yriart, Bill Parsley, Piero Tesauro, Marcelo Pitchon, Greg Williams, *(back row)* Mauro Speranzini, Marco Barusco, Ken Washenik, *(front row)* Sara Roberts, Ken Williams, Executive Director Victoria Ceh

ISHRS Meeting Staff

L to R: Amy Hein (Meeting Planner), Davin Ayarzagoitia (Administrative Coordinator), Jule Uddfolk (Meeting & Exhibits Manager), Katie Masini (Membership Manager & Registrar), Victoria Ceh (Executive Director), Melanie Stancampiano (Program Manager), Kimberly Miller (HQ & Administrative Manager), Jeff Miller (Database & Technical Support & Registrar). Not pictured: Sheri Valskis (Project Manager)

ISHRS LEADERSHIP & COMMITTEES

September 28-October 1, 2016 • Las Vegas, Nevada, USA

ISHRS 2015–2016 Board of Governors

Front L to R: Arthur Tykocinski, Ken Washenik, Kuniyoshi Yagyu, Sharon Keene, Sungjoo Hwang
Back L to R: Victoria Ceh (Executive Director), Francisco Jimenez, David Perez-Meza, James Harris, Robert True, Melvin Mayer, Jean Devroye, Paul McAndrews, Robert Leonard, Nilofer Farjo. Not pictured: William Parsley.

ISHRS 2015–2016 Executive Committee

Back L to R: Arthur Tykocinski, MD, FISHRS (Treasurer), Sungjoo Tommy Hwang MD, PhD, FISHRS (Secretary)
Front L to R: Ken Washenik, MD, PhD, FISHRS (Vice President), Kuniyoshi Yagyu, MD, FISHRS (President), Sharon A. Keene MD, FISHRS (Immediate Past-President)

FUE Research Committee

Front L to R: Ken Williams, Chiara Insalaco, James Harris, Kapil Dua
Back L to R: Márcio Crisóstomo, Tayfun Oguzoglu, Ali Emre Karadeniz, Parsa Mohebi

ISHRS Past Presidents

L to R: Sharon Keene (2014–2015), Robert Leonard (1995–1996), Edwin Esptein (2009–2010), Paul Cotterill (2006–2007), Russell Knudsen (1997–1998), Paul Rose (2005–2006), Carlos Puig (2012–2013)

Global Council of Hair Restoration Surgery Societies

Dr. Yagyu acknowledging Victoria Ceh, Executive Director.

2016 ISHRS RESEARCH GRANT RECIPIENTS

Use of Finasteride and the Onset of Depression: A Prospective Cohort Study
Paul V. Shapiro, MD and David S. Josephitis, DO, FISHRS *(pictured)* and Mark Schuler, PhD

Biocellular Regenerative Therapy in Hair Loss: Use of High Density Platelet-Rich Plasma Concentrates and Cell-Enriched Emulsified Adipose-Derived Tissue Stromal Vascular Fraction
Ken L. Williams, Jr., DO, FISHRS *(pictured),* Robert Alexander, MD, DMD, FICS, Robert Niedbalski, DO, Bernard Nusbaum, MD, FISHRS, Paul Rose, MD, FISHRS and Ryan Welter MD, PhD

Bisulfite Sequencing of Human Dermal Papilla Cells
Gregory Williams, MBBS, FISHRS *(pictured)* and Claire Higgins, PhD

Growth Factor Concentration Influence on Scalp Hair Grafts
Bradley R. Wolf, MD, FISHRS and Chiara Insalaco, MD *(pictured)* and John P. Cole, MD

2016 ISHRS POSTER AWARDS

1st PLACE
Multi Case Example of Infection Induced by Documented PRP Contamination
Tayfun Oguzoglu, MD

2nd PLACE
SFRP2 Augments Wnt/β-catenin Signaling in Cultured Dermal Papilla Cells
Jisup Ahn, MD, PhD, FISHRS

BEST PRACTICAL TIP
KD Spreader—A Slit Dilating Device
Kuldeep Saxena, MBBS, DDV

2016 AWARDS & RECOGNITION

2016 GOLDEN FOLLICLE AWARD
James E. Vogel, MD, FISHRS
For outstanding and significant clinical contributions related to hair restoration surgery.
Acceptance speech:
https://www.youtube.com/watch?v=kxWqxyfwLZQ

2016 PLATINUM FOLLICLE AWARD
Gholamali Abbasi, MD
For outstanding achievement in basic science or clinically related research in hair pathophysiology or anatomy as it relates to hair restoration.

2016 MANFRED LUCAS AWARD
Paul M. Straub MD, FISHRS
Lifetime achievement
Dr. Straub accepts the Manfred Lucas Award from Dr. Yagyu.

2016 DISTINGUISHED ASSISTANT AWARD
Brandi J. Burgess
Presented to a surgical assistant for exemplary service and outstanding accomplishments in the field of hair restoration surgery.
Brandi Burgess *(left)* accepts award from Emina Vance, Chair of the Surgical Assistants Awards Committee *(right).*

FORUM EDITORS (2014–2016)
Dr. Yagyu *(right)* presented awards to Drs. Robert True *(left)* and Mario Marzola *(center)* for outstanding work as *Forum* Editors for their 3-year terms, 2014-2016.

2015–2016 PRESIDENT
Dr. Yagyu accepts the President's Award from Dr. Sharon Keene Immediate Past-President.

2016 AWARDS & RECOGNITION

OUTGOING OFFICERS

Accepting plaques for their service from Dr. Yagyu *(center)*: Ken Washenik (Vice President 2015-2016) (left), Sungjoo Hwang, MD, PhD, FISHRS (Secretary 2014-2016) *(right)*.

OUTGOING BOARD MEMBER

Dr. Yagyu presenting plaque to David Perez-Meza, MD, FISHRS, for his service on the Board of Governors, 2010-2016.

2016 SPECIAL SERVICE AWARDS

Dr. Yagyu *(right)* presented Emina Vance an award for her immense efforts in research and development of a synthetic training material for hair restoration surgery to be used in ISHRS hands-on courses. Dr. Washenik standing in for Emina Vance. And Tina Lardner *(center)* for helping with testing and evaluating the training materials.

For their great efforts in assisting with complex regulatory issues and standards in Europe, Dr. Yagyu *(center)* presented plaques to Drs. Jean Devroye *(left)* and Greg Williams *(right)*.

For their great efforts and commitment to the ISHRS in promoting high standards of safety and quality of care for patients, Dr. Yagyu *(right)* presented to *(L to R)* Drs. Ken Washenik, Ken Williams, Sharon Keene, Edwin Epstein, Paul Rose, Ricardo Mejia, and (not pictured) Carlos Puig and O. Tayfun Oguzoglu

LAST MAN STANDING CLUB: ATTENDED ALL 24 MEETINGS!

L to R: Drs. Bob Haber, Ivan Cohen, Bessam Farjo, Paul Straub, Mario Marzola, Russell Knudsen, John Gillespie, Ed Epstein, Paul Cotterill, Bob Leonard


JOIN THE ISHRS
Graft
Dissection


Development of an Automatic Implanting Machine
ISHRS WORLD CONGR
INTERNATIONAL SOCIETY OF
ISHRS

CONGRATULATIONS TO THE FISHRS CLASS OF 2016!

Kulakarn Amonpattana, MD, FISHRS
Kenneth Anderson, MD, FISHRS
Marco N. Barusco, MD, FISHRS
Kapil Dua, MBBS, MS FISHRS
Alex Ginzburg, MD, FISHRS
Thomas Kohn, MD, FISHRS
Robert Niedbalski, DO, FISHRS
Gregory A. Pistone, MD, FISHRS
Lawrence E. Samuels, MD, FISHRS
Paul Shapiro, MD, FISHRS
Michael Zufelt, MD, FISHRS

Since 2012, 105 members have earned the designation of Fellow of the ISHRS, with the privilege to use the prestigious acronym of "FISHRS' behind their name.

FISHRS was established in order to recognize members who met exceptional educational criteria. In order to be considered, the hair restoration surgeon must achieve a specific level of points in a system of various educational parameters such as serving in leadership positions, American Board of Hair Restoration (ABHRS) certification, writing of scientific papers, teaching at scientific programs, among others.

It is a great honor for a member to achieve the FISHRS designation. This recognizes the surgeon who strives for excellence in this specialized field. To maintain this status, the surgeon must continue to meet established educational criteria over time.

We encourage all Physician Members to consider applying for Fellow status.

Qualifications and process can be found in the Members Only section of ISHRS website at: http://www.ishrs.org/members-only/ishrs-fellow-category

New! Additional point possibilities have been added for attending or presenting at regional society scientific meetings that are members of the Global Council of Hair Restoration Surgery Societies. (http://www.ishrs.org/content/global-council)

The full list of 105 Fellows as of October 5, 2016, may be found at: http://www.ishrs.org/content/fellows-fishrs-international-society-hair-restoration-surgery

Plan your 2017 meeting schedule!

2017 Qualifying Meetings for Member Educational Maintenance Requirement

As a reminder, there is an educational maintenance requirement for the membership categories of "Member" and "Fellow Member." This does not apply to membership categories of: Associate Member, Resident Member, Emeritus Member, or Surgical Assistant Member.

Educational maintenance requirements:

ISHRS Member and ISHRS Fellow Member membership categories must attend one ISHRS-approved meeting every 3 years, otherwise that member will be changed to Associate Member. The impacted member may revert back to their previous category after attendance at an ISHRS-approved meeting.

2017 Qualifying Meetings

April 26-29, 2017
ISHRS Orlando Live Surgery Workshop
Orlando, Florida, USA
HValarieM@leavittmgt.com

October 1-2, 2017
ISHRS World Live Surgery Workshop:
FUE Immersion
Polanica Zdrój, Poland
www.25thannual.org

October 4-7, 2017
25th World Congress of the ISHRS
Prague, Czech Republic
www.25thannual.org

November 16-19, 2017
Hair Transplant 360 Cadaver Workshop &
FUE Hands-On Workshop
St. Louis, Missouri, USA
http://pa.slu.edu

The qualifying meetings are also listed at this link:
http://www.ishrs.org/content/list-ishrs-approved-meetings-meet-additional-minimum-educational-requirement

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Message from the ISHRS 2017 World Congress Program Chair

Jean Devroye, MD, FISHRS *Brussels, Belgium* prague2017ishrs@gmail.com

The great and inspiring meeting in Las Vegas has just ended and we are already starting to prepare for the next one in Prague. I would like to take the opportunity to congratulate my predecessor Dr. Marcelo Pitchon and the entire program committee of the ISHRS for the wonderful job they accomplished. It will be a real challenge to reach the same quality level. Furthermore, it is the 25th annual event, which gives it the title of "Silver Jubilee," and this strengthens the stakes awaiting us. So the ISHRS, this great society founded by Drs. Dow Stough and O'Tar Norwood in April 1993, will be entering its 25th year.

Equestrian statue above Prague city; photo by Dominik Michalek.

The ISHRS has ambitious principles and purposes: *"Above all, the ISHRS is dedicated to achieving excellence in patient outcomes by promoting the highest standards of medical practice, medical ethics, and research in the medical hair restoration industry."* The 2017 World Congress in October in Prague will be the climax of the year 2017 and will be the occasion to provide the latest information on hair medical and surgical treatments.

Prague in Czech Republic has been a political, cultural, and economic centre of central Europe with waxing and waning fortunes during its history. Prague is home to a number of famous cultural attractions, many of which survived the violence and destruction of 20th-century Europe. Main attractions include the Prague Castle, the Charles Bridge, and Old Town Square with the beautiful Prague astronomical clock, which is the oldest operating astronomical clock in the world dating back to the year 1410. Since 1992, the extensive historic centre of Prague has been included on the UNESCO list of World Heritage Sites.

This year, the ISHRS decided to couple the World Congress in Poland with a live surgery workshop exclusively dedicated to FUE. The World Congress will take place in Prague from October 4th till October 7th, 2017 while the World Live Surgery Workshop (LSW) will take place in Polanica Zdrój, Poland, on October 1st and 2nd. It will be orchestrated by my colleagues Drs. Arthur Tykocinski and Jerzy Kolasinski.

We shall act together so that both programs are coordinated and make a coherent set. For those of you wishing to attend both meetings, below is the schedule of events:

2017 World LSW and Congress Schedule

Saturday/September 30—Arrivals in Prague, transfers from Prague (Czech Republic) to Polanica Zdrój, (Poland) by bus
Sunday/October 1—LSW Day 1
Monday/October 2—LSW Day 2
Tuesday/October 3—Transfer day from Polanica Zdrój to Prague
Wednesday/October 4—Pre-Congress Courses (Basics Course, Advanced/Board Review, Surgical Assistants Core Skills Workshop, and Surgical Assistants Program, etc.)
Thursday/October 5—First main day of general sessions, evening Welcome Reception
Friday/October 6—Second main day of general sessions, evening M&M Conference
Saturday/October 7—Third main day of general sessions and adjourn; evening Gala off site at The Municipal House

The hair transplant surgery field moves very fast. Patients are fully aware of the challenges. They know the limitation of their donor area and the importance of the hair capital management. They are looking more and more for quality work. This is why I would like to emphasize next year's theme of quality: Quality of the analysis, quality of the strategy, quality of the techniques.

Specific topics like the new implanters, the long hair FUE and non-shaven FUE techniques, transgender treatment, corrective procedures, and also the latest research on FUE and more science about cell therapy, gene therapy and biotechnology with several world famous scientists will be covered. This year, the poster session will take a big place in our meeting. The presenters will have the possibility to explain in details their presentations. Numerous prizes will be distributed and a special session about the best posters will be organized. I'm also open to any suggestions from you, our attendees, so please feel free to send me an email with your ideas or suggestions to Pragueishrs2017mail.com.

It seems the formula with many mini-courses for beginners or intermediate levels, workshops, lunch symposia, and discussion table topics adopted by Dr. Marcelo Pitchon have been a big success. The next meeting will continue in this direction!

For assistants, remember we have a detailed surgical assistants program, and this year's chair is the wonderful Emina Vance.

Time is short, abstracts and posters will have to be submitted to the CME Committee at the end of this year… so get prepared to participate in the most exciting 2017 ISHRS World Congress in Prague!◆

Message from the 2017 World Live Surgery Workshop Program Chair

Arthur Tykocinski, MD, FISHRS *São Paulo, Brazil* info@ishrs.org

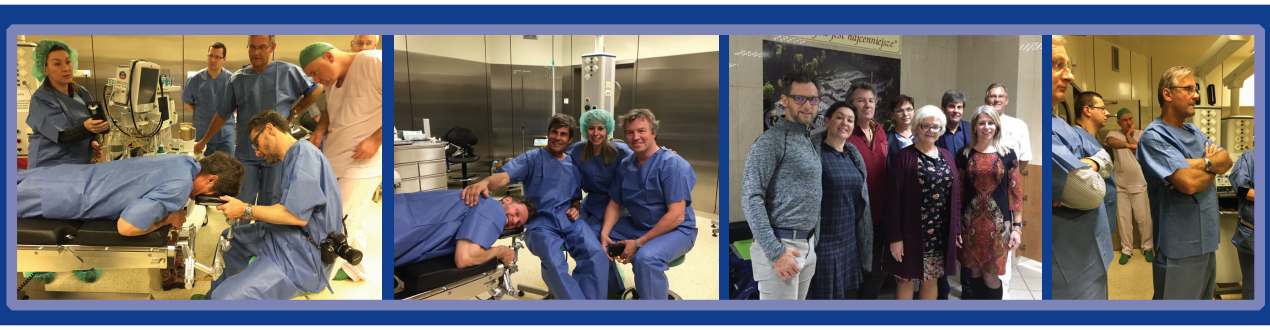
It doesn't matter how many congresses you have attended, nothing compares to a Live Surgery Workshop (LSW). Of course, you can take to the road and visit 12 clinics in a world tour, but not many of us can afford this or have such a free pass to do this. When visiting a clinic, you are just an observer. The ISHRS LSW will be interactive, with a moderator and questions from the audience.

My first LSW was remarkable for me and guided my way in HT. Don't get me wrong: LSW is not just for beginners, but it is for all levels. For the beginners, it is awesome because they can actually see how HT works. But for the advanced surgeons, a lot of nuances can be seen and compared. HT is all about details. Details really matter. Despite comparing techniques, it isn't surprising that different techniques can each be performed brilliantly by different surgeons. In other words, any technique can be good. Some techniques may be tailored more for your style, and others not.

Lead by our president, Dr. Ken Washenik, we are committed to delivering an LSW that is focused on learning and not on showing off. This is not a contest about who is the best. Rather, it is just the opposite. It is about exchanging experiences, debating, formulating questions, and looking ahead. Expect some controversies—but the ultimate goal is for everyone to advance some steps ahead, even the faculty. It is not just another live surgery workshop—it will be a brainstorming session. Some of the best and most experienced FUE surgeons from around the globe are committed to teaching you.

Although it is one year away, we already know that there will be *limited seats* in order to ensure the best learning experience possible. We have already pre-booked one-quarter of the seats with those who have expressed interest in attending. You may pre-book as well! **Make your pre-registration now and save the date: www.25thannual.org.**

The World LSW will take place 4 days before the 2017 Prague Congress, during 2 days: 1st and 2nd October 2017. Transfers in/out Prague will be provided. Please direct your questions or suggestions to arthur@cabelo.med.br.◆



A note from the organizers: We were just visiting Prague and Polanica Zdroj. The facilities are really wonderful. The hospital will allow the organisation of a huge FUE workshop.

Message from the 2017 Surgical Assistants Program Chair

Emina Vance *Plano, Texas, USA* emina@hairtx.com

It is a great honor to be selected to chair the 2017 Surgical Assistants Program. I'm sincerely looking forward to the opportunity to share my passion for hair restoration with surgical assistants from around the world.

Over the years, the Surgical Assistants Program has evolved and improved. This year was no exception. Sara Roberts from the Farjo clinic put together a wonderful agenda that catered to the beginners and the experienced assistants. The program was divided into lectures focusing on the basics of hair restoration and the panel discussions addressing the advanced topics. The international faculty and the dynamic panel discussions provided valuable information to everyone in the audience. We watched, we listened to the audience, and we created a new program for next year.

There are two major changes: first, the Surgical Assistants Program will take place in the afternoon, and second, we are shifting the basics lectures to the Core Skills Workshop and changing the Program's topics to cater toward more experienced assistants. By moving the Surgical Assistants Program to the afternoon, we are hoping to facilitate traveling arrangements for the attendees (i.e., accommodate for late evening or early morning travels). Regarding the Surgical Assistants Program, we are adding extra time and are expanding the variety of topics. We hope this change will encourage more practicing physicians to bring their surgical assistants to the meeting.◆

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Dates and locations for future World Congresses of the ISHRS

2017: 25th World Congress
October 4-7, 2017
Prague, Czech Republic

WITH

World Live Surgery Workshop
October 1-2, 2017
Polanica Zdrój, Poland

2018: 26th World Congress
October 2018
USA

2019: 27th World Congress
November 13-17, 2019
Bangkok, Thailand

2020: 28th World Congress
October 21-25, 2020
Panama City, Panama

Check out the Calendar of Hair Restoration Surgery Events:
http://www.ishrs.org/content/upcoming-events

HAIR TRANSPLANT forum INTERNATIONAL

Advancing the art and science of hair restoration

Upcoming Events

	Date(s)	Event/Venue	Sponsoring Organization(s)	Contact Information
	November 26-27, 2016	21st Annual Meeting of the JSCHR *Hamagin Hall, Yokohama, Japan*	Japan Society of Clinical Hair Restoration (JSCHR) Hosted by Prof. Kazuo Kishi, MD *http://www.jschr.org/*	Prof. Kazuo Kishi, MD, Program Chair Maiko Kuroda, Secretary *m.kuroda@z6.keio.jp*
	February 24-27, 2017	HAIRCON 2017: The Scientific Meeting of the Association of Hair Transplant Surgeons of India *Ludhiana, Punjab, India*	Association of Hair Restoration Surgeons-India (AHRS) *http://www.ahrsindia.org/*	Dr. Kapil Dua: *drkapildua@akclinics.com*
	February 28-March 3, 2017 May 9-12, 2017	University Diploma of Scalp Pathology and Surgery *Paris, France*	University of Paris VI Coordinators: P. Bouhanna, MD and M. Divaris, MD *www.hair-surgery-diploma-paris.com*	Dr. Pierre Bouhanna, Course Director *sylvie.gaillard@upmc.fr*
	March 9-11, 2017	3rd Latin American Hair Transplant Workshop FUE Workshop 2017 *Asuncion, Paraguay*	Paraguayan Society of Hair Restoration Surgery (SPACREC) and Paraguayan Society of Plastic & Reconstructive Surgery (SPACPRE)	*http://workshop-latc.com/*
	March 31-April 2, 2017	5th Annual Scientific Meeting in Hair Restoration & Live Surgery Workshop *Bangkok, Thailand*	Asian Association of Hair Restoration Surgeons (AAHRS) *www.aahrs.asia*	*5thaahrs@gmail.com*
*	April 26-29, 2017	ISHRS Orlando Live Surgery Workshop *Orlando, Florida, USA*	International Society of Hair Restoration Surgery *www.ishrs.org*	*hvalariem@leavittmgt.com* 1-321-594-553
	May 21, 2017	7th Annual Scientific Meeting of KSHRS *Seoul, Korea*	Korean Society of Hair Restoration Surgery (KSHRS) *www.kshrs.org*	*kshrs@naver.com*
	May 27-28, 2017	Society for Hair Science/ISHR International Scientific Meeting *Venice, Italy*	Italian Society for Hair Science Hosted by Andrea Marliani, MD *http://eventi.sitri.it/en/*	segreteria@sitri.it vincenzogambino@vincenzogambino.com
*	October 1-2, 2017	ISHRS World Live Surgery Workshop *Polanica Zdrój, Poland*	International Society of Hair Restoration Surgery *www.25thannual.org*	*info@ishrs.org*
*	October 4-7, 2017	25th World Congress of the ISHRS *Prague, Czech Republic*	International Society of Hair Restoration Surgery *www.25thannual.org*	*info@ishrs.org*
	October 20-22, 2017	ISHRS Advanced FUE Workshop L.A. *Los Angeles, California, USA*	International Society of Hair Restoration Surgery	*drumar@dru.com*
	October 31-November 3, 2017	10th World Congress for Hair Research (WCHR2017) *Kyoto, Japan*	The Society for Hair Science Research-Japan *http://www.congre.co.jp/wchr2017/*	*wchr2017@congre.co.jp*
*	November 16-19, 2017	Hair Transplant 360 Cadaver Workshop & FUE Hands-On Workshop *St. Louis, Missouri, USA*	Saint Louis University School of Medicine, Practical Anatomy & Surgical Education In Collaboration with International Society of Hair Restoration Surgery	Dr. Samuel L. Lam, Course Director Emina Vance, Asst. Course Director *http://pa.slu.edu*

*2017 meetings that qualify for the ISHRS member educational maintenance requirement