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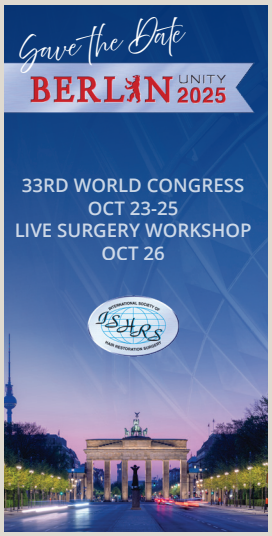


# Hair Restoration with Non-Ablative Er:YAG Laser

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## ABSTRACT

***Introduction:*** Hair loss is one of the most common aesthetic concerns in women and men worldwide. Laser therapy, including low-level laser therapy, has demonstrated potential efficacy in hair restoration; however, not enough is known about the effect of Er:YAG laser monotherapy.

***Methods:*** Four female patients with Ludwig scale classification level I-3 to I-4 androgenetic alopecia (AGA) were treated with 8 sessions of non-ablative Er:YAG laser (2940nm). The outcome was assessed objectively using trichoscopy analysis of the frontal, vertex, temporal, and occipital scalp regions, and subjectively by means of a patient satisfaction questionnaire using the 7-point Likert scale from 1 (very unsatisfied with hair appearance) to 7 (very satisfied with hair appearance). All metrics were assessed at baseline, after the fourth session, after the eighth session, and at the 1-month and 3-month follow-up visits. At each session, patients were monitored for potential pain during the laser treatment by means of an 11-point pain scale.

***Results:*** Compared to baseline, average hair count, cumulative hair thickness, and number of follicular units (FUs) at different time points demonstrated relatively large fluctuations. Nevertheless, at 3-month follow-up all patients exhibited an increase in trichoscopy parameters from baseline in all scalp regions, with a statistically significant increase in the vertex and frontal regions, indicating an improvement of AGA symptoms after treatment. Median patient satisfaction increased on the Likert scale from a 3 at baseline to a 6 at the 3-month follow-up.

***Conclusion:*** Treatment results of this small case series suggest that monotherapy with non-ablative Er:YAG laser is a promising treatment for AGA; however, more studies are needed to confirm the efficacy of this modality.

***Keywords:*** Er:YAG laser, hair loss, hair restoration, trichoscopy



## INTRODUCTION

Hair is an important component of identity and self-image, and some patients with hair loss can experience a distorted body image and a decrease in quality of life.[1] Androgenetic alopecia (AGA), also known as male pattern hair loss (MPHL) or female pattern hair loss (FPHL), is the most common form of alopecia worldwide, and it is characterized by progressive terminal hair loss after puberty.[2] It is a multifactorial disorder caused by genetic factors, excessive response to androgens, environmental and systemic factors, and aging.[3] AGA is estimated to affect 50% of Caucasian males and females by the age of 50 and 80, respectively.[4] The incidence of AGA increases with age in both genders across all ethnicities.[5] It has been noted that early onset of AGA in young adults is a source of depression.[6] Additionally, an early onset of AGA has been associated with a variety of chronic conditions such as metabolic syndrome, which is a cluster of metabolic abnormalities including obesity, hyperlipidemia, insulin resistance, and hypertension.[7]

There are several available treatment options for AGA. These include different oral and topical pharmaceuticals, nutraceuticals, low-level laser therapy (LLLT), platelet-rich plasma (PRP) therapy, and a variety of surgical transplant procedures.[8] The only FDA-approved drugs include oral finasteride for men and topical minoxidil for men and women. Many patients seek alternatives to pharmacological treatment, which can display plateauing in the response and also cause undesirable side effects.[6]

The distinctive features of AGA include a gradual and progressive miniaturization of hair follicles and a decrease in the ratio of the active growth stage to the resting stage of the hair cycle.[6] Hair follicle stem cells regenerate in continuous cycles consisting of three stages: 1) growth (anagen), 2) involution (cata-

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# President's Message

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Dear Colleagues:

I recently had the privilege of attending the African Society of Hair Restoration Surgery Workshop. This educational event, hosted by Dr. Shady El Maghraby—an ISHRS Board of Governors member and ABHRS Treasurer—was organized in collaboration with the Arab Association of Hair Restoration, a Global Council sister society of the ISHRS. This workshop united doctors from across Africa and beyond, representing the core pillars of the ISHRS and emphasizing the importance of achieving diplomate status with the ABHRS.

What struck me most during this workshop was a humbling realization: as I grow older and, hopefully, wiser, I often find there is much I don't fully understand about other cultures. This underscores the importance of expanding my own cultural knowledge and stepping outside my personal bubble. It was enlightening and inspiring to engage with different doctors from different cultures.

### *Unity and Inclusivity in the ISHRS Community*

As president of an international society, I realize that we must always think beyond traditional boundaries, champion diversity and inclusivity, and create educational opportunities for all physicians. I met many eager young talented doctors who displayed a great passion to learn hair. I was particularly impressed by the enthusiasm of Dr. Charles Otieno, who expressed his desire to organize an ISHRS regional workshop in Kenya. His passion was evident as he immediately contacted the director of the health ministry to ensure he could secure the necessary permissions and licenses for a future workshop in line with established ISHRS guidelines and principles.

Our society is blessed to have many talented physicians dedicated to advancing our specialty through academic research, technology, and education. But beyond the educational achievements, it is the friendships and bonds within the ISHRS community that set our field apart. This unity, transcending past residencies or specialties, is of vital importance to the growth and success of our field.

In today's polarized political environment, it can be difficult to maintain unity with our colleagues who have differing opinions and beliefs. However, as professionals, we must rise above politics to focus on advancing the field of hair restoration. We should be able to learn from each other, regardless of our personal views.

### *Non-ISHRS Educational Workshops: Purpose and Innovation*

Learning opportunities are offered at various ISHRS workshops, as well as those organized by our esteemed device owner members. Two upcoming workshops, led by ISHRS members—the Long Hair FUE workshop in Malaga, Spain, on February 21-22, 2025, and the workshop in Tashkent, Uzbekistan from September 5-7, 2025—are typically not endorsed by the ISHRS due to potential conflicts of commercialization. As a 501(c)(3) organization, the ISHRS exists for the public good, aiming to improve patient outcomes and advance the field. We achieve this by providing education, maintaining ethical guidelines, and promoting research, which are core pillars of our mission.

Although supporting our members' business ventures doesn't align with the core purpose of the ISHRS, which makes promotion in WhatsApp groups challenging, the upcoming educational event in Malaga led by ISHRS Past President Paco Jimenez and distinguished board members like Marie Schambach, is noteworthy. FUE owes much of its current success to the contributions of our members who have developed key devices and techniques. The advancement of long hair FUE, though complex, has significantly improved, and these commercial workshops—coordinated by ISHRS members such as Jean Devroye (WAW), Sanusi Umar (Zeus), Jae Park (graMAX), and Roberto Trivellini (Mamba)—serve as valuable resources for doctors to learn the latest innovations and enhance patient care.

While the educational component of the above workshops typically includes devices from other manufacturers, the ISHRS does not endorse or promote any one company or product. Our primary focus remains on education, not on promoting any single business venture or product. I am honored as ISHRS President to be invited to these workshops in Spain and Uzbekistan where I will be able to encourage doctors to join the ISHRS, discuss our theme of "unity," and promote the message of our Fight The FIGHT campaign.

### *Looking Ahead to 2025: Strengthening Our Bonds*

As we move forward in 2025, let us continue to foster our friendships, strengthen our bonds, and expand our collective knowledge in unity. I am grateful to everyone who has volunteered their time and expertise—whether through contributing to this journal, accepting a committee assignment, or any number of ways—to make our ISHRS family stronger. For those not yet involved, please know there is always an opportunity to contribute.

Our goal for the Berlin 2025 meeting is to deliver not only a cutting-edge educational program but also to bring together colleagues with diverse talents and perspectives to advance our field. Equally important is creating an environment for social engagement and fun. My thanks go to Sam Lam for his efforts in organizing a high-quality academic agenda and to Nina Otberg, our "fun chair," for ensuring an engaging and enjoyable experience.

This is a meeting not to be missed. ■

# Co-Editors' Message

Natalie Kash, MD | *Bellevue, Washington, USA;*
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We wish you all a very happy New Year! We are very excited to serve as co-editors for the *Forum* for our third and final year. Our goal for 2025 is to ensure that our final six issues are as impactful and educational as possible for our ISHRS colleagues.

This first issue gets us off to a great start! The lead article by Dr. Ana Maletić is a case series reporting the potential efficacy of monotherapy with non-ablative Er:YAG laser for androgenetic alopecia (AGA). Laser therapy for AGA is an important emerging area of study, and we encourage other physicians to consider reporting their results with these modalities.

In Notes from the Editor Emeritus, Dr. Russel Knudsen highlights important considerations on the potential pitfalls and risks of the recent trend towards larger and larger cases. Dr. Knudsen clarifies that the goal of a hair transplant should shift from obtaining the highest number of grafts or greatest density possible to achieving the minimum coverage needed to meet the patient's needs. He discusses the importance of this concept in saving grafts for the future given the need to plan for the worst-case scenario in terms of hair loss progression. Dr. Knudsen points out that it is better to err on the side of a smaller procedure and need to do a second procedure than it is to use more grafts than needed to achieve the desired result. This is a great reminder to consider long-term planning and the potential for future hair loss progression in the era of the increasingly popular "mega" and "giga" sessions.

The Notable Articles Project revisits a 2009 interview with Dr. Rodney Sinclair, posing the same questions about female pattern hair loss (FPHL) for him to answer in 2025. His responses from both years are presented side by side, highlighting how perspectives and treatments have evolved over time. This engaging read covers topics such as first-line treatments, topical minoxidil, anti-androgens, supplements, ferritin levels, and photobiomodulation in FPHL.

Dr. Russel Knudsen's Controversies column highlights the benefits of avoiding a full scalp shave for hair transplants, such as maintaining discretion and using recipient hair as a guide during the procedure.

In How I Do It, Dr. Jerry Cooley explores the use of adipose-derived stem cells (ADSCs) harvested from FUT strip fat to enhance hair transplantation outcomes. By using the Rigenera® system to process the fat, ADSCs are injected into the recipient area, promoting angiogenesis, reducing fibrosis, and improving graft survival and hair quality. Dr. Cooley shares four years of observations, noting accelerated growth, thicker non-transplanted hair, and overall improved results, particularly for patients with challenging hair characteristics. While acknowledging the lack of controlled studies, he emphasizes the potential of this technique as a valuable bio-enhancement in FUT procedures.

The Literature Review by Dr. Guillermo Guerrero summarizes recent articles focusing on hair transplant for post-operative secondary scarring alopecia, the efficacy of histidine-tryptophan-ketoglutarate (HTK) solution for the preservation of grafts, and clinical features of patients with FPHL who underwent hair transplant.

This issue also includes Notes from the 2024 AMA Interim Meeting by Dr. Sara Wasserbauer, who succinctly summarizes several important issues discussed at the meeting attended by our delegates, Dr. Wasserbauer and Dr. Carlos Puig. Notable topics summarized in the notes include scope of practice, updates on non-American Board of Medical Specialties board recognition, and artificial intelligence regulation in medicine. Dr. Wasserbauer's update provides good information on where we are and where we are going in these areas—as a specialty and as a society.

In other columns in this issue, Dr. Wasserbauer's Hairs the Question covers the topic of Afro-type hair restoration, reviewing important considerations in patients with this hair type. In his 2025 World Congress Program Chair message, Dr. Sam Lam provides more details on the innovative structure of the upcoming meeting, including offering a number of new short and long videos and masterclasses. Dr. Rana Irfan, newly appointed ABHRS president, fills his section with a discussion on the organization's goal of uplifting global standards of hair restoration.

As our tenure as co-editors comes to an end, the search for the next set of co-editors, set to begin their term in 2026, is now underway! This issue features an important Call for Co-Editors. If you're passionate about serving the ISHRS community by contributing to the exchange of knowledge, ideas, and expertise as a *Forum* Co-Editor, we encourage you to apply by June 1, 2025. For details on qualifications and the application process, see page 9.

As you plan for 2025, we encourage you to consider contributing to the *Forum*. Before submitting a scientific article, column submission, or letter to the editors, please download and complete required forms found here: **https://www.ishrs-htforum.org/content/authors**. Please email the forms along with your submission to **forumeditors@ishrs.org**.

We extend our heartfelt thanks to everyone who has shared their work with us—it has been an honor to collaborate with you in bringing your contributions to publication. ■

# Notes from the Editor Emeritus, 1999–2001

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## How Much Hair Is Enough?

Having just returned from the Denver ISHRS Annual Scientific Meeting, I was again struck by the continued focus on supplying an ever greater number of grafts to our patients. This is a trend that has been happening for some years, particularly with the development of FUE harvesting that allows harvesting of areas other than the scalp, most often beard.

With strip harvesting, the density of the donor area and the patient's scalp flexibility limited the maximum size of the harvest. Combined harvesting using both strip and FUE has been championed by some surgeons for a number of years as a way to expand the number of scalp grafts being harvested in a single session. For those who practice exclusively utilizing FUE harvesting (the majority of surgeons worldwide these days), non-scalp hair harvesting, particularly beard in men, has become an increasingly popular second choice of donor to expand graft numbers. At first glance, this seems beneficial, but I believe many surgeons fail to consider the long-term implications of their decisions.

> ***I learned long ago not to predict exactly what patients would require to achieve their goals. They will usually surprise you, and I think this is because they prize uniformity of coverage at least as much as the degree of coverage.***

Let's start by thinking about the philosophy of what we are doing for our patients. Given that we cannot increase the number of transplantable hairs from the scalp, we must redistribute the limited available donor hairs to their best advantage. Our goal is to achieve "cosmetic density," which is determined not just by the number of hairs but also by hair quality (caliber, curl, color). Our goal should, therefore, not be to maximize graft and hair numbers necessarily, but to achieve adequate coverage that meets the patient's needs.

When I talk to patients about outcomes, I describe the goal as providing the patient with a *minimum comfort level*. By this, I mean the patient is happy with the result but knows that more density could be achieved. I also explain that it is hard to describe what this level might be, but the patient will know it when they see it. I learned long ago not to predict exactly what patients would require to achieve their goals. They will usually surprise you, and I think this is because they prize *uniformity* of coverage at least as much as the *degree* of coverage.

I first learned this lesson many years ago when Japanese Nido synthetic fibers were introduced into Australia. I was surprised by how few fibers were required to satisfy patients and it dawned on me that the uniformity of coverage was the key. The development of follicular unit grafting reinforced this insight as again I realized that uniform placement of the FU grafts did not require huge densities to achieve patient satisfaction.

Why is this important? We must realize that we still have no guaranteed long-term stability strategies through medications or regenerative medical therapies. In other words, expect our patients to continue to thin and lose hair as they age. Adherence to long-term medication is variable at best. In addition, we must recognize that not all our grafted hairs survive in perpetuity. Many of my surgical colleagues who had also undergone hair grafting continued to thin, even in the grafted areas, as I met them at meetings over the years. It is, therefore, imperative for our long-term management strategies, especially in our younger patients, to keep donor hairs in reserve for anticipated future needs.

The use of ever greater numbers of hairs to meet current hair loss, especially at very high densities, reduces the "reserve" that we might need in the future. I would especially describe beard donor hairs as "future donor reserve hairs" that would be "plan B" when we run out of scalp hairs to deal with progressive hair loss.

When surgeons describe grafting densities of 50-60 grafts per $cm^2$ or describe the use of 8000 scalp hairs in conjunction with 3000 beard hairs as their solution for their young patients, I am left to wonder how any future hair loss will be managed if we have exhausted their donor supply in an attempt to give them maximum numerical density rather than adequate cosmetic density?

It is my philosophy that I would rather use the smallest number of grafts to achieve patient goals. If that requires a "top-up" surgery to achieve this 12 months later, then I would rather this than use an unnecessarily larger number of hairs that leaves the patient with a smaller donor reserve for future needs. I suggest you will be surprised by how happy patients are with grafting at 30-35 grafts per $cm^2$ if evenness of coverage is achieved and how many of them will not ask for that top-up at this stage.

The fact that something is possible does not necessarily make it advisable and should never make it compulsory. ■