Crowning Glory

THE LATEST OPTIONS FOR THE GROWING NUMBER OF MEN AND WOMEN SEEKING NONINVASIVE AND SURGICAL SOLUTIONS TO HAIR LOSS.

By Linda W. Lewis

Hair restoration procedures in the United States jumped 27% from 2012 to 2014, and the worldwide market for hair restoration surgery increased 28% from $1.9 billion to $2.5 billion, according to the International Society of Hair Restoration Surgery (ISHRS) 2015 Practice Census Results.

“Hair restoration is about 40% of my practice, mostly men and a few women with androgenic alopecia, but we also see female patients for scar revision,” says facial plastic surgeon Sean R. Weiss, MD, of Khoobehi and Associates in New Orleans. “Facelifts can leave areas behind and in front of the ear where hair doesn’t grow properly, and I have great success restoring sideburns and hair lines for these patients. Although this is currently just a tiny fraction of our business, it is something I think we’ll be seeing more often in the future.”

While men have been the primary focus—and still make up the majority of patients—for practices that offer hair restoration services, a growing number of women are seeking treatment for age-related hair loss and thinning. In 2014, women comprised only 15% of surgical hair restoration patients, but they made up 40% of nonsurgical patients, according to ISHRS data.

“My husband is a hair transplant surgeon, and we found that his practice really didn’t serve the unique needs of his female clients,” says Mary Wendel, MD, medical director of Medi Tresse in Wellesley, Massachusetts, New England’s only medical hair rejuvenation center catering exclusively

to women. “It is often harder for women to seek help, and we soon realized that a transplant office populated with men was not ideal.”

Nadia Satya Urato, MD, of Urato Dermatology in Framingham, Massachusetts, is also seeing an increase in female patients at her practice. “For women, hair loss is perhaps more devastating than for men because luxuriant hair is so tied to femininity,” she says.

While physicians specializing in hair restoration still don’t have the silver bullet many patients seek to stop hair loss, their ability to help men and women with thinning hair is improving with new noninvasive procedures and more effective surgical treatments.

Noninvasive Options

All of the physicians we interviewed recommend a comprehensive approach to hair loss that includes not only a thorough scalp examination and testing to rule out systemic conditions that might cause thinning hair, but also a discussion of nutrition and lifestyle. All but one of our panelists recommend minoxidil, which works by increasing blood flow to the follicles, and finasteride, which inhibits DHT, for appropriate patients.

Some patients even combine the two medications.

Richard P. Giannotto, MD, of Giannotto Clinic in McClean, Virginia, is cautious. “I feel that minoxidil and finasteride have too many side effects to be used long term,” he says. “I do recommend saw palmetto for many patients desiring a natural remedy to help slow down hair loss progression.”

Androgenic alopecia is the most common cause of hair loss among both men and women. “Men can begin to see the effects of male pattern baldness in their early 20s and often seek help at that time,” says Jeffrey Epstein, MD, a facial plastic surgeon with offices in New York City and Miami, and spokesman for the International Alliance of Hair Restoration Surgeons. “With men we often use a combination of medical and surgical treatments. To help younger men hang on to the hair they have, we prescribe medications such as Propecia (finasteride) and low level laser therapy (LLLT). For women, who comprise about 30% of our practice, we combine Rogaine (minoxidil) and LLLT treatments. Shampoos such as Nizoral (ketoconazole dandruff shampoo, McNeil) or Nioxin can help clean up the scalp and perhaps improve the effectiveness of other treatments.”

John Kahen, MD, founder and medical director of Beverly Hills Hair Restoration, says shampoos that inhibit DHT “show fairly positive effects on my patients suffering from hair loss.” He also recommends minoxidil and vitamins targeted to hair and nail growth.

Dr. Weiss encourages all of his patients to use minoxidil and finasteride if they can. “These medications not only help patients hold on to existing hair but can help improve the quality of hair growth, even for patients after transplant surgery,” he says. He also recommends vitamins such as BioSil and Viviscal to support the overall quality of hair growth.

“I like Propecia for older men with more advanced hair loss who may be thinking about hair transplantation but aren’t ready yet,” says Dr. Urato. “It helps them preserve the hair they have and can give them a small amount of regrowth, about 15%. I am less likely to suggest it to younger men because of its side effects.”

Low Level Laser Therapy (LLLT): “We are thrilled with LLLT,” says Dr. Urato. “It is safe, safe, safe and it works, works, works. I’ve used several devices but my favorite is the iGrow (Apira Science).

It's easy to use, but I am frank about expectations. LLLT won't suddenly produce luxurious hair growth, but it can help patients keep what they do have and add on average 20% regrowth. Most women are thrilled with the responses they get. During the first month they are relieved that their hair is no longer falling out as it was and then during the next few months they begin to see new growth. Fewer than 2% express dissatisfaction."

A randomized, blinded study of the iGrow Hair Growth System published in the October 2014 issue of *Lasers in Surgery and Medicine* compared 24 female patients treated with iGrow to 18 patients treated with a sham device. The iGrow produced a 37% increase in hair growth, significantly higher than the sham device. The iGrow System is FDA approved for both men (January 2013) and women (December 2014).

"We have been using LLLT for years, especially in the post-op care of transplant patients," says Dr. Giannotto. "Healing is quicker and graft growth is accelerated. LLLT as a stand-alone program is a wonderful way to help stop the progression of hair loss in men and women. It can also be used as a preventive measure in patients just beginning to notice hair loss. The original FDA study showed that 87% of men using LLLT stopped the progression of their hair loss. My patients love the program."

Platelet Rich Plasma (PRP): "I have performed countless platelet rich plasma (PRP) procedures in my clinic over the past two years generating successful results. PRP is truly an innovation to the world of hair restoration," says Dr. Kahen. "I also use PRP therapy in conjunction with my hair restoration surgery procedures. It helps patients recover quicker while also creating more density and speeding up the hair growth process. PRP is more appropriate for patients with androgenic alopecia."

Dr. Wendel calls PRP her go-to treatment "for women with androgenic alopecia or alopecia areata, not alone but in combination with minoxidil and LLLT. We have the larger devices in our practice but often use the LaserComb (Hair-Max) or LaserCap (LCPro). We have more experience with these devices and don't believe that bigger is always better."

"PRP is an awesome way of enhancing healing and growth after transplantation," adds Dr. Giannotto. "We use it on every patient undergoing a restoration procedure. PRP can also be used to prevent or slow down the progression of hair loss. Several of our patients have noticed good hair growth beginning several months after the procedure. It is important to counsel the patient undergoing just PRP (no surgery) so that they understand that this is not a permanent solution to hair loss and usually requires maintenance sessions every four to six months."

Dr. Epstein doesn't use PRP as a stand-alone procedure but he does find it useful for some patients to provide additional treatment of their hair loss. "We combine the PRP with ACell MatriStem, which is a regenerative matrix that seems to improve outcomes," he says. Dr. Weiss and Dr. Urato do not offer PRP, saying there isn't enough evidence to support its efficacy.

Surgical Solutions

"Surgical hair restoration techniques have certainly progressed, especially in the last five years. When I started performing hair restoration surgery, we were in the era of mini-grafts and micro-grafts," says Dr. Giannotto. "This technique was replaced by follicular unit transplantation (FUT) in which a strip of donor hair with follicles intact was removed. This strip was dissected under microscopy and the grafts were isolated and implanted into the donor area. Using microscopic studies, this technique was refined by dissecting follicular units from the strip— defined as a group of one to four or more hairs—and the glands that supply them. Splitting follicular units down further

destroyed their growth potential. The advantage of the FUT method was that a variety of follicular unit sizes could be isolated mimicking natural hair growth patterns."

The downside to FUT is that, while it offers good results in the transplant area, it is painful and often leaves a troublesome scar in the donor area. "We prefer FUE (follicular unit extraction), which leaves no linear scar, causes less discomfort and allows for quicker recovery," says Dr. Weiss. "We use the ARTAS robotic system to aid follicular extraction with all of our patients now. We have found it to be better than handheld automated devices because of its computer algorithms, precision and accuracy—all of which facilitate a better quality procedure."

When describing the benefits of ARTAS to his patients, Dr. Weiss likens it to a baseball pitcher who will inevitably tire during a long game. "The pitcher eventually gets tired and his accuracy and precision decline. A robot is not subject to such fatigue and continues to produce high quality grafts for the duration of the procedure," he says. "The ARTAS robot allows me to improve the quality of care I can offer patients."

About half of hair restoration surgeons are now using some type of automated system for FUE. Dr. Epstein uses several handheld, powered FUE devices, including the NeoGraft Automated Hair Transplantation System and a custom-designed E-Fue System. "We don't use ARTAS at this time because our current systems are providing outstanding results and the technology is still undergoing improvements. Surgical technique is the most important aspect of the transplant procedure," he says.

"I have used NeoGraft, ARTAS and SmartGraft techniques," says Dr. Giannotto. "All are good although results may vary from surgeon to surgeon depending upon technique. ARTAS is totally robotic in that the machine harvests the grafts and in some instances creates donor incisions as the physician controls the parameters of the procedure from a computer screen. NeoGraft and SmartGraft are physician-assisted automated FUE procedures in which the physician holds the handpiece and actually selects the units to be harvested. All of these automated systems add irrigation to keep the grafts moist and collect the grafts via suction. There is no gold standard, but my new workhorse for large cases (greater than 2,000 grafts) has become the SmartGraft machine. What ultimately gives the patient the best results should be the criterion for choosing a particular procedure."

Even with advances in FUT and FUE technologies, about half of hair restoration surgeons prefer traditional surgical techniques. "Although there are advantages to ancillary machines such as decreased labor for the surgeon and a reduced number of staff required, I personally don't favor the use of ancillary devices in my procedures. I firmly believe the machines used in hair restoration cannot replace the precision and judgment of a skilled surgeon," says Dr. Kahen.

Regardless of which surgical technique you prefer, it is vital to develop a long-term plan before settling on a treatment modality. "Women need to be careful about transplants because of the progressive nature of hair loss," says Dr. Epstein. "And men need a long-range plan for the same reason."

Ongoing Research

Current noninvasive hair restoration options offer moderate improvement for most patients at least in the short term, but physicians working in this specialty are hoping more effective treatments will be available soon.

Bimatoprost (Latisse, Allergan), which patients have been using for several years now to grow longer, stronger eyelashes and enhance brows, may offer some hope for scalp hair as well. Results of Phase 2 trials of Bimatoprost Scalp, due for completion in January 2015, were disappointing, according to a report from the Belgravia Center, one of the largest hair restoration centers in the U.K. The acquisition of Allergan by global pharmaceutical company Actavis may slow any further progress for a time.

Drugs that inhibit prostaglandin D2, found in excess amounts on bald scalps, are already being used to treat asthma, and KYTHERA (acquired by Allergan in June 2015) has initiated trials of KYTH-105, a selective oral antagonist of PGD2 for use in treating androgenic alopecia. In early research studies, PGD2 inhibitors were found to extend the anagen (growth) phase of the hair cycle, thereby promoting the growth of hair. “I am fascinated with prostaglandin therapy and am excited to see where that may be headed,” says Dr. Wendel.

Dr. Weiss is looking forward to further advances in robotic technologies. “Eventually, I believe robotic technology will be developed not only for the extraction part of the hair transplantation procedure but for graft placement as well,” he says. “We are looking forward to watching that technology develop. I also think we will find less invasive ways to restore hair growth. Stem cell technology offers one possibility. Researchers have been able to isolate cells important to hair growth and eventually we may be able to inject a stem cell solution that will stimulate hair growth—but probably not for 15 to 20 years.”

Dr. Epstein is more optimistic. “We hope to see more stem cell research and perhaps a breakthrough in stem cells for hair restoration in the next five years,” he says.

Scientists are investigating stem cells in different ways for use in hair restoration. Angela Christiano, a dermatology professor at Columbia University with a special interest in hair genetics, has formed a company to investigate growing hair stem cells in the laboratory that can be injected into the scalp, thereby regenerating inactive hair follicles. According to an article in the *New York Times*(April 15, 2015), she would start by harvesting a patch of 50 to 100 hairs from a patient’s scalp and then dissect and duplicate them under laboratory conditions to produce millions of stem cells, enough to inject all over the scalp. Christiano hopes to begin clinical trials of the technique in 2016 or 2017.

Gene therapy is another avenue of research. Curis is working on a model using sonic hedgehog, a protein that plays a role in organ development—but there are dozens of genes that control hair growth so this protein alone is unlikely to hold the key to hair restoration.

The online journal *PLOS* (January 21, 2015) includes an article by researchers from Sanford-Burnham University that may be central to the development of hair restoration stem cell therapy. They created dermal papilla cells from embryonic stem cells and showed these cells could stimulate hair growth. The research was done with mice and will have to be duplicated in humans. With so much progress made and so many promising solutions in the pipeline, physicians have a wealth of information to share with patients who are struggling with thinning or lost hair.

Linda W. Lewis is the contributing editor of MedEsthetics.