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Tumes-SENSE Strategies: Commonsense, Effective Methods for Incorporating More Fluid into Your Practice

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Tumescence of all types is commonly used in hair transplantation surgery. But how effective is it really and what solution is best to use? Much like graft holding solutions, most surgeons tend to prefer whatever they used in their training. Unfortunately, our field lacks robust studies about most of our daily practices—including the different uses and types of tumescence. Without a general consensus or a single training source to guide our operative decisions, there are as many different ways to add fluid to a surgical field as there are surgeons.

Tumescence has been used for years, so some commonsense strategies are definitely known and understood. Here are some common ways tumescence can be used effectively in your practice. If you are not yet using tumescence, “how to do it” instructions are included to help you get started. If you are already using tumescence, please share your experiences by taking my short (4-minute) survey at <https://www.surveymonkey.com/r/77ZZR79> and see how your practice compares.

TAKE THE ONLINE SURVEY!*

Share your experience at:

<https://www.surveymonkey.com/r/77ZZR79>

**This is the author’s own survey; not an ISHRS survey.*

DONOR AREA

Linear excision (strip) surgery is improved most by full-thickness tissue turgor. When injected into the donor area prior to making the incision, tumescence improves hemostasis and increases tissue stability/turgor allowing the incision and excision to be more precise. By lifting the tissue off the deeper vascular bed, blood vessel and nerve injuries can be reduced. It also separates the follicles within the strip making follicular unit dissection easier. Linear excision can be performed without any tumescence at all, and many surgeons have found other ways (skin hooks, manual tension) to stabilize elastic tissue, but tumescence can turn a rubbery, slippery case into a smooth one with only even a few milliliters of saline.

How to do it: With a 20-25g needle, quickly add 70-120ml of your favorite tumescent solution until turgor is achieved (see “Which tumescence is best?” section at the end of this article). The area is ready for excision when it feels hard; be prepared to make your scoring incision quickly before the fluid drains into the surrounding scalp. Patients may feel an uncomfortable “pressure” sensation during the process for which you can reduce the speed of injection.

In FUE surgeries, tumescence can be a bit tricky. Similar to linear excision surgery, full-thickness tumescence helps with hemostasis and reduces the risk of nerve and vessel damage, but by making the follicle more rigid within the tissue, it hypothetically increases the risk that a follicle might become transected.



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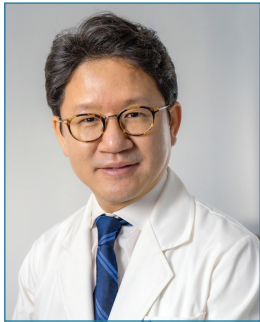
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President's Message

Sungjoo (Tommy) Hwang, MD, PhD, FISHS | Seoul, South Korea | president@ishrs.org

Dear Colleagues,

During my time serving as president of the ISHRS, I have been invited to several national conferences. In early June, I attended the 8th International Congress of the Korean Society

of Hair Restoration Surgery. Including this conference, I have attended conferences and workshops in five countries: India, Taiwan, China, Korea, and the United Arab Emirates. At each of the academic conferences, new ideas and procedures were presented. It is evident that many physicians are trying to provide their patients with better medical procedures in a more effective and safer way using better technology. I offer my respect to the many hair transplantation doctors around the world who are working hard for this.

Unfortunately, a few physicians are performing unethical practices and using inappropriate marketing methods. This is disappointing for colleagues who are working hard. According to the doctors in Turkey, many technicians are performing FUE procedures. This is a very serious situation, and if it is allowed to continue, there is the possibility that it could spread to other parts of the world.

Regardless of FUT or FUE, the hair restoration procedure is considered a surgery—and physicians MUST perform surgery. A technician should never perform a surgery. The ISHRS opposes this unethical, unlicensed practice of medicine. Recently, the Ministry of Health and Welfare in South Korea introduced a policy that states the process of inserting hair follicles into the skin is a medical procedure to be performed by a physician, not a nurse, because transplanting a part of skin into the human body is an important procedure.

The Korean government has made it illegal for a nurse to make an FUE donor incision and to insert a hair follicle after a physician has made a slit in the recipient area. I am sure that each country will have different policies but there is no question that it is the physician's responsibility to make the incision in the human skin whether it is a strip incision or an FUE incision. As president of the ISHRS, I strongly encourage you to participate in our campaign, "Surgeons perform the surgery, not technicians."

At last year's World Congress in Prague, we announced a call for volunteers to participate and work on the various committees of the ISHRS. This recruitment for committee volunteers was intended to encourage more members to participate and assist in the important work of the society. This was the first time such a call for committee volunteers was initiated in the 25-year history of the society. I was impressed by and appreciated the magnitude of support and enthusiasm from the applicants and would like to express my deepest thanks and gratitude to all of you who applied. There were far more applications than expected! Since then, I have made sincere efforts to include as many

volunteers as possible and was able to place 236 members on 29 committees! If you were not assigned to the committee you requested, it is a reflection of the overwhelming interest among our members to participate, and I encourage you to keep applying. Those who are willing to work when and where they are needed will be given priority for other committee assignments they request in the future. I would also like to express my sincere gratitude to all the committee members who have been serving as committee members for a long period of time.

I would like to share some good news. As I had mentioned in my last column, we have been in the process of developing an e-platform that has a *Forum* search function. We have officially signed a contract with a company to develop this e-platform. We will be able to search for articles published over the past 20 years that our seniors and colleagues worked hard to write. This will be a benefit available only to ISHRS members. I would like to recommend you to encourage your colleagues who are not yet members of the ISHRS to participate. I can't stress enough how grateful I am for the ISHRS staff, led by Dr. Bob True and Victoria Ceh, for all of their hard work on this project.

We are considering a city in the south of Europe for the 2021 World Congress venue. If members would like to recommend a suitable city, the Board of Governors will consider it.

Lastly, the Hollywood World Congress is now a few months away. The World Congress committee has been organizing the entire conference by classifying the abstracts. An e-mail has also been sent about the conference registration and hotel reservation. I would like to ask members to register for the World Congress and make their hotel room reservation as soon as possible and use the ISHRS code to ensure they receive our group rate. My thanks to all of you and I look forward to seeing you soon in Hollywood at the ISHRS's 26th World Congress! ■

Co-editors' Messages

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This issue discusses graft harvesting and graft placing in different articles.

The article by Kuniyoshi Yagyu highlights the importance of donor area management, a subject previously explored by Keene et al. in their article, "Determining safe excision limits in FUE: factors that affect, and a simple way to maintain, aesthetic donor density" (*Hair Transplant Forum Int'l.* 2018; 28(1):1, 7-11). Before planning a repeat FUE procedure, Dr. Yagyu estimates the number of previous excisions by comparing the FU density in an untouched area with the FU density in the previously harvested area. In repeat FUE procedures, it is helpful to examine the donor area pre-operatively as we get closer to the point when thinning becomes visible. In my view, the 50 percent rule of plucked hair does not really apply because it may not be valid when FUs are completely excised. The confluence of gaps leads to visible thinning.

If no untouched area is present for comparison, we can alternatively use digital imaging to measure residual FU density, hair density, gap density, and hair thickness. These measurements are also helpful to estimate the total number and density of previously excised FUs and compare them with the alleged numbers given by the previous surgeon.

I suggest creating an "HT Pass" or "Log Book" to give to the patient after the procedure.

Data included in your log book could be the original donor density, harvested donor area size, and number of transplanted grafts. It still would not include critical information about transection rates, harvesting density, or number of transplanted hairs, which many surgeons do not want to measure in daily routine. But even this data would be helpful information for repeat procedures and could potentially increase the transparency of hair transplantation and honesty in the field.

In his Ethics column, Greg Williams discusses honesty with patients. One of the problems is that patients are being promised unrealistically high graft numbers. The honest surgeon who assesses the donor area and calculates the estimated graft yield, and who keeps grafts in the donor area for the future, has a hard time competing, especially in the increasingly popular "online consultation" or "graft calculator" environment. This is a major problem, ethically and for the "survival" of honest independent surgeons.

Another type of dull implanter is presented by Parsa Mohebi. He calls it an inserter to clearly differentiate it from implanters, which can be sharp or dull. On this occasion, we had a discussion about the terminology of implantation and implanters. Doesn't implantation involve the two steps of incision and placing? Should dull placing devices also be called implanters or will this lead to confusion? Could the important difference of sharp and dull be overlooked?

The ISHRS Board of Governors discussed these questions and decided that these devices should always clearly be described and labeled as sharp (incisional) to be used by the surgeon only or dull (non-incisional). The use of dull devices to insert grafts into sites that have been pre-made by the doctor can be delegated to trained, unlicensed personnel in most countries.



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For some time, the donor area has been the most popular topic at conferences and has dominated the literature as well. Refreshingly, Sara Wasserbauer explores an important and overlooked topic, tumescence. When used appropriately, tumescence can act as a valuable assistant in the donor and recipient areas by augmenting the anesthesia and vasoconstriction that are necessary for us to be able to perform our craft. Firming up lax or mushy donor tissue during strip and FUE harvesting allows for precision excision, which decreases transection. Vasoconstriction assists us with recipient site creation and atraumatic placing, which improves our results. Of course, each patient's tissue must be assessed as the need for, and solution appropriate for, tumescence will vary. Please take our online survey to add your experience to our knowledge base. Getting your input was Sara's idea and we plan on using it for other topics in future *Forum* issues.

Another popular topic has been surgery performed by unlicensed assistants. Tommy Hwang discusses it in his President's message, Bob Haber mentions it in his Editor Emeritus address, and Russell Knudsen touches on it in his Controversies column. While not mentioned specifically, it is no doubt contributing to the overharvesting and high transection rates seen in Kuniyoshi Yagyu's article on the FUE donor area. Since this practice is illegal in most jurisdictions, it is only logical that licensed mid-level practitioners could replace unlicensed assistants as well as licensed physicians as the professionals patients look to for hair transplants. Someday hair transplantation may be just another procedure offered and performed at medical spas. I'm sure there will be more debate on this topic as it evolves.

Make your plans to visit Hollywood for our 26th annual World Congress in October. The Hollywood Walk of Fame is a mere 0.8 miles from the Loews Hotel where we will be meeting. Many more attractions await you in the Los Angeles area, but remember, it is a very spread out metropolitan area, unlike quaint, compact Prague. Traffic can be terrible, so allow time for travel and avoid peak travel hours. We look forward to seeing you all in California. ■

To better assess all the new devices, we need more objective data. We need to see the differences and advantages compared to established techniques. This is very important to improve our field as my colleagues and I noted in our 2006 *Forum* submission, "Evidence Based Hair Restoration—Designing Clinical Trials" (*Hair Transplant Forum Int'l.* 2006; 16(3):85-89).

Please share your thoughts about these topics in letters to the editors. And if you submit an article, don't forget to provide proof of any claims. ■

➤ Bottom next column

Notes from the Editor Emeritus, 2005–07

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It's always something. Smooth sailing in the field of hair transplantation just doesn't seem to happen. Way back in 1994 when I completed my fellowship with Dow Stough in Arkansas, the majority of surgeons were still using large plugs and adamantly defending their use. So we strip harvesters waged our battle and slowly convinced our colleagues of the benefits of leaving plugs behind.

With one battle over, another loomed. Most offices still did not use microscopes, so the microscope users of the world fought hard to bring the field into agreement that slivering and cutting were best done under microscopic control. So was all peaceful then? No, as most of us still believed that large sessions (over 1,000) were ill advised. So the megasession folks battled hard to convince the rest of us that large sessions were safe, and now, of course, no graft number appears to be too large. Yet many doctors still believed in cutting grafts to size, so the follicular unit people then had to fight their battle as well, until the building block of hair surgery was successfully altered.

There was a small battle between those that produced multiple stacked donor scars and those that produced only a single scar, but that was a minor donor scar battle compared to one that started with the introduction of FUE! Strip surgeons were confident that FUE would be a brief experiment doomed to failure, but it did put us on the defensive and it forced us to dramatically improve our scars.

As FUE found its permanent place in our field though, there was an unintended consequence. For all the battles that had come in the decades before, hair restoration always remained fundamentally a bona fide surgical procedure performed by surgeons. No one but a surgeon would wield a scalpel to harvest tissue. But the miniscule scale of FUE changed all that, as wielding a tiny punch could be learned by anyone. And indeed it was. It was cost-effective, albeit often illegal, to allow non surgeons to perform extractions, and that battle unfortunately created a schism between fine people who adhered to different standards of conduct.

But the repetitive nature of FUE extractions produced yet an even more sinister development in the form of automation. Machines, such as NeoGraft® and ARTAS®, which are promoted as requiring minimal training or expertise, have dramatically altered the battle. Whereas before we thousand or so trained hair surgeons battled each other, we now as a group face a potential army of tens of thousands of physicians with no passion whatsoever for hair restoration, but rather for quick economic gain from an alluring business model. These practitioners happily and often ignorantly delegate surgery to unlicensed personnel, and do so while remaining completely out of reach of the sanctions of our society. Unconfirmed estimates conclude that there are

more owners of NeoGraft and ARTAS who are not members of the ISHRS than there are total members of the ISHRS.

Indeed, in my own corner of the world, no fewer than three NeoGraft providers have popped up in the past couple of years that have been owned by plastic surgeons with no training, interest, or expertise in hair surgery, and backed by a multimillion-dollar corporate advertising budget. To the best of my knowledge, none of the surgeons are actually operating the machines themselves. The potential for patient harm is immense, and yet there is little to nothing that can be done. The battle has moved to State Medical Boards and State Attorneys General.

And if by grit and good fortune we are somehow able to purge illegal non-licensed operators from the field of hair restoration, still another challenge awaits. "Mid-level practitioners" (MLPs), which in the United States are Nurse Practitioners (NPs) and Physicians Assistants (PAs), are rapidly gaining complete autonomy to practice without supervision. That means an NP or PA can now or soon will be able to open a hair transplant practice with no physician supervision. Violating no laws, and yet not having a membership category in the ISHRS, these individuals may form their own society and compete with no restrictions. I'm not really sure what would happen at that point in time. MLPs complete their training in only a few short years, are thus not encumbered by significant debt, and are typically willing to work for significantly less compensation than physicians.

Once open, Pandora's Box cannot be closed. What battles do we fight, what alliances do we form, to successfully protect the field of hair restoration from these threats? Those of us who have patiently nursed our society and field from its early years into maturity want nothing more than to pass it on to a younger, smarter, and cleverer generation. One that will create surgical results for future patients that exceed our current skills. But who will want to take our place if unlicensed practitioners or, perhaps even worse, licensed non-physicians, dominate the field?

If there is a bright spot, it is the energy and competence of the ISHRS leadership, and the enthusiasm of our newest members. Perhaps they can navigate these waters successfully.

See you all in Hollywood! ■

The most practical use of tumescence during FUE may be very superficial injection for stabilizing the uppermost layers. Similar to a trampoline being stretched tightly, this allows the hair shaft to be stable during the engagement of the punch, while still allowing the hair shaft and follicle below the surface to move into the lumen during punch insertion. With this method, practitioners have reported less bleeding, faster extraction times, and reduced transections with all punch types.¹ It even works well with body hair extractions and mimics the use of hand tension (or use of a tensioner device as with the ARTAS®). (From the author's own experience, it can be helpful even when using a tensioner device in place during robotic surgery.) Full-thickness tumescence has been found to be helpful for patients with extremely lax or mushy FUE donor tissue.

How to do it: Use a 30g needle or similar (but not less than 27g) to inject your favorite tumescence very superficially (~1mm) beneath the surface of the donor area skin. Skin should blanch (even without epinephrine), and minimal ridging should be noted after infiltration. This is most effective when small areas (3-5cm²) are tumesced at a time. Use deeper infiltration for patients with extremely lax or mushy FUE donor tissue.

RECIPIENT AREA

Whether you are placing grafts in a brow or on a scalp, properly executed tumescence can make your day easier. Not only does it effectively induce hemostasis by protecting the vascular bed (along with depth-controlled incisions), but it also allows for making sites more precisely and closer together than non-tumesced skin would permit. Native hairs can also be avoided more easily in this way. After making incisions and placing grafts, the tissue returns to its unstretched baseline and the grafts draw closer together leaving a denser outcome than would be possible otherwise.

The only drawback of recipient-area tumescence is the potential post-op facial swelling when gravity pulls the extra fluid through the lymph channels surrounding the recipient area. For most scalp surgeries, this can result in forehead swelling on post-op day 2 or 3, and the effect lasts 2-3 days. Strategies for reducing this appearance include the following:

- Putting foam tape or an elastic bandage across the forehead for the immediate post-op period to re-channel the fluid down the sides of the forehead
- Sleeping at a 45-degree angle the first 3 nights
- Taking steroids: oral, IM, and/or in the "Abbasi solution" (see "Which tumescence is best?" section)
- Self-massaging of the forehead in a mid to lateral motion
- Avoiding adding sodium bicarbonate (buffering) to tumescent solutions

How to do it: Use a 27-30g needle in any direction or an 18-20g needle in the direction sites will be made (since the bigger needles will effectively create a graft site) to inject 50-150ml of your favorite tumescent solution into the recipient area. Wait roughly 10 minutes until hemostasis is achieved and then start making sites. For especially elastic skin, progress across the recipient area

in stages, tumescing as you make recipient sites to take full advantage of the turgor created.

WHICH TUMESCENCE IS BEST?

All forms of tumescence have their place in hair transplantation surgery. From saline alone to complex custom mixtures with anesthesia and epinephrine, different solutions accomplish different tasks.

Chilled saline is a solid standby for the beginning hair transplant surgeon. Without epinephrine or additional anesthesia, it is the safest (it's hard to overdose on normal saline!) and easiest to monitor; 50-200ml titrated to effect in the donor or recipient area will reduce bleeding and widen the inter-follicular distance for either FUE or linear excision surgery. Its effects wear off quickly, however, and a few minutes should be allotted for it to take effect, so the window of usefulness is short. If chilled saline isn't available, room temperature saline can be used, but the colder it is, the greater the vasoconstrictive effect it will have.

Saline plus small amounts of epinephrine (1-2ml or 1:1000 epinephrine in 250ml of saline, which creates a 1:125,000 to 1:250,000 solution) can significantly reduce bleeding across both the donor and the recipient areas within minutes and can prevent washout of local anesthesia, thus reducing the overall total amount of anesthesia (and reducing the risk of toxicity).

Overuse of a higher concentrated "superjuice" solution (loosely defined as a concentration of epinephrine between 1:10,000 to 1:50,000) can reduce blood supply and at least theoretically induce shedding or poor graft survival, so caution must be used with mixtures of adrenaline and small amounts of saline alone. Systemic epinephrine effects (tachycardia, elevated blood pressure, tremors, and nervousness) can occur. Be especially careful using superjuice in patients with preexisting cardiovascular disease. Tiny brisk "bleeders" that occur in FUE donor areas, and sometimes during site-making in recipient areas, are the perfect target for limited use of this type of tumescence. An option to manage the risks of epinephrine overuse when tumescence is used over a larger area is, staggered dosing, but to be fair, these risks are reported to be rare and clinical trials regarding safety, efficacy, and calculating overall risk are lacking.²

Saline plus anesthetic agents such as lidocaine or bupivacaine make the ever-helpful "tumescent anesthesia." Common in liposuction procedures where large volumes of dilute solutions are used, tumescent anesthesia has been shown to reduce pain and improve hemostasis even with higher total doses of anesthesia, all while reducing the incidence of toxicity.³ Gillespie anesthetizes the donor area with 0.2% lidocaine with 1:500,000 epinephrine and uses a tumescent solution of 0.1% lidocaine with 1:500,000 epinephrine for both the donor and recipient areas.⁴

The tumescent anesthesia suggested by Abbasi can be used in both the donor and the recipient areas for anesthesia and tumescence, making it a popular choice for surgeons.⁵ It is unbuffered and thus may be slightly more painful to inject, but it reduces the incidence of post-operative edema with the addition of triamcinolone acetonide, induces hemostasis, and reduces the total amount of anesthesia needed with epinephrine, all in a saline/lidocaine mix. Like Gilles-

pie's mixture, Abbasi's solution has published study data for its use, which allows advanced hair transplant clinics to base their anesthesia decisions on tangible data.

CONCLUSION

These are merely general suggestions in a universe of tumescence options. After reviewing all of the different possibilities for donor or recipient tumescence over the years, it became clear that the only unwise tumescence choice is undiluted anesthesia and/or a high concentration of epinephrine, since the risk of toxicity is highest. Because data is the lifeblood of our treatment decisions, and because the best practices of tumescence are not well documented, please take a moment to add your voice and opinion by taking the survey found at <https://www.surveymonkey.com/r/77ZZR79>.

References

1. Personal email communication with Drs. Robert True and James Harris. Instruction during ISHRS FUE Regional Workshop in Denver, Colorado; October 2-3, 2009.
2. Wolf, B.R. Overview of anesthesia. In: W. P. Unger, et al. *Hair Transplantation*, 5th edition. Chapter 8: Anesthesia. Marcel Dekker: New York, 2011; p. 234.
3. Morganroth, P.A., et al. A randomized, double-blind comparison of the total dose of 1.0% lidocaine with 1:100,000 epinephrine versus 0.5% lidocaine with 1:200,000 epinephrine required for effective local anesthesia during Moh's micrographic surgery for skin cancers. *J Am Acad Dermatol*. 2009; 60(3):444-452.
4. Gillespie, J.D.N. Tumescence anesthesia in hair transplantation. In: W.P. Unger, et al., *Hair Transplantation*, 5th edition. Chapter 8: Anesthesia. Marcel Dekker: New York, 2011; pp. 235-237.
5. Abbasi, G. Hair transplantation without post-operative edema. *Hair Transplant Forum Int'l*. 2005; 15(5):149, 158. ■

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