

FORUM

VOLUME 35 | NUMBER 4
JULY/AUGUST

2025

HAIR TRANSPLANT FORUM INTERNATIONAL

IN THIS ISSUE

2025 Practice Census Shows Members' Commitment to Excellence in Hair Restoration Despite Growing Black Market

Report on the 2025 Annual Meeting of the American Medical Association

Preview Long Hair FUE: Pros & Cons, Tips & Tricks

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ABSTRACT

Hair transplantation techniques have evolved significantly over the years, with follicular unit excision (FUE) becoming a preferred method due to its minimally invasive nature and natural-looking results. However, conventional FUE procedures are not without limitations, particularly when it comes to transplanting long hair, as there are difficulties in graft handling and implanting. This article explores the advantages and disadvantages of the preview long hair FUE technique, a promising advancement aimed at mitigating the drawbacks associated with conventional methods. This review will evaluate current research and clinical outcomes, discussing how the previous long hair FUE technique addresses challenges in each surgical phase, from planning through post-op care. Additionally, it will examine the procedural adjustments and technological innovations that optimize the surgical technique itself and provide the best outcomes. Despite its promising benefits, potential drawbacks, such as increased procedural time and specialized skill requirements, will also be considered. This review underscores the potential of the preview long hair FUE technique as a viable solution for enhancing the efficacy and aesthetic quality of hair transplantation procedures, paving the way for further advancements in the field.

Keywords: preview long hair FUE (PLH-FUE), coverage value, Velcro, finger cup, graft curvature control

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INTRODUCTION

Follicular unit excision (FUE), formerly known as follicular unit extraction, has evolved since Woods began performing the technique in 2001 and following Rassman's 2002 article, "Follicular Unit Extraction: Minimally Invasive Surgery for Hair Transplantation."¹ Since then, advancements in technology have led to the creation of new devices, punches, and excision and placing methods.

In 2006, Pitchon published the article, "Preview Long Hair Transplantation," in which he describes his surgical technique, previewing results in patients who have a strip surgery, leaving all his grafts with long hair shafts during placement to preview a possible final outcome immediately post-surgery.² Preview long hair follicular unit excision (PLH-FUE) is an innovative hair transplant technique that is reserved for those who consider themselves advanced in the art of hair restoration surgery. This technique is time-consuming, requiring a lot of patience and precision and, above all, good eye-hand coordination.

Bouhanna explained that during long hair FUT, the long hair graft technique creates a naturally aesthetic appearance by meticulously implanting hairs in the balding area with surgical needles and jeweler's forceps. This method allows for careful selection of hair emergence angles, orientation, and obliquity. It results in a finely crafted and irregular "one-by-one" frontal hairline, with the implantation of 2,000 to 3,000 hairs per session, ensuring an even distribution of many additional micro grafts and follicular unit (FU) grafts.³

In 2016, Boaventura described long hair FUE and a novel punch for manual extractions,⁴ and since that time, there have been multiple punch proposals to achieve that technique. Also in 2016, I began experimenting with long hair FUE using different self-modified punches. I then described, for the first time, the characteristics of the actual long hair FUE technique, where the distal long hair shaft travels alongside the incision. I created the modified notch punch, and in 2017, I presented the first case series.

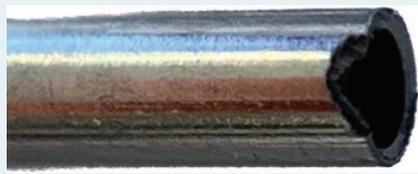
In 2012, Trivellini presented a prototype of a long hair excision device featuring a hook that pulls the hair shaft into the punch's lumen. In 2017, I presented a series of cases involving long hair techniques using different devices, demonstrating a method where the hair graft travels alongside the punch into the

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FIGURE 1. Photo of the “Schambach notch” produced on all types of punches in 2016.



incision. I also showed how to create a specific notch to avoid cutting the hair shaft (Figure 1).⁵ In 2018, Trivellini presented the first official device for long hair FUE.⁶ Later,

in 2020, I published the first comparative study between long hair and shaved hair FUE proving that graft quality was similar with both techniques and advancing my research on the significance of long hair grafts in body hair FUE.^{7,8}

Also in 2020, Umar published a YouTube video showing a new device for long hair and later published an article claiming this device was created for “all-purpose” graft harvesting.⁹ By 2021, preview long hair was being performed more frequently and by several doctors, introducing new concepts, new devices, and new punches as preview long hair continued to evolve.¹⁰

With preview long hair FUE, we haven’t yet reached the excision speed necessary to make it a standard choice for hair transplantation; nevertheless, as technology evolves, this technique will become more available. It is important to acknowledge the advantages and disadvantages this procedure offers to our patients.

PREVIEW LONG HAIR FUE DYNAMICS

Hair is surprisingly strong. The cortex keratin is responsible for this property, and its long chains are compressed to form a regular structure that is not only strong but also flexible. The physical properties of hair include resistance to stretching, elasticity, and hydrophilic ability. In general, the weight required to cause a natural hair thread to rupture is between 50-100g.¹¹ An average head contains about 120,000 hair threads and can support approximately 12 tons. The resistance to breakage depends on the diameter of the thread and the condition of the cortex, and it is negatively affected by chemical treatments.¹²

Skin puncture involves the insertion of a sharp object into the skin, requiring enough force to overcome the resistance of the epidermis, the outer layer of the skin. Factors such as the sharpness of the object, the angle of entry, and the properties of the skin itself affect the ease of penetration. The skin is made up of multiple layers, with the epidermis primarily consisting of dead skin cells that form a protective barrier, while the dermis contains blood vessels, nerves, and other structures.¹³

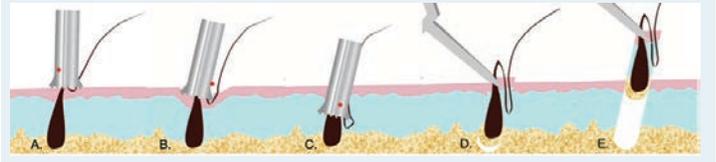
Skin puncture and hair shaft breakage dynamics are distinct phenomena governed by different physical principles and structural compositions. Skin puncture is less resistant than hair breakage,¹⁴ which is why in PLH-FUE you should look for that sweet spot of dynamic forces and choose the ideal punches that allow for skin incision without causing hair shaft breakage. I first described this technique at the 2017 ISHRS World Congress in Prague.¹⁵

PREVIEW LONG HAIR FUE TECHNIQUE

The technique I developed in 2016 describes making a punch-like incision around an FU that is strong enough

to cut through the layers of skin but soft enough to avoid cutting the hair shaft. The hair shaft travels along the side of the punch into the skin. Once the incision is made, the FU is pulled from the skin by the hair shaft, leaving the desired length of the hair shaft (Figure 2).

FIGURE 2. To remove an FU, center a semi-sharp punch at the center of the FU (A), angle the punch in the direction of the hair shaft excision (B), start a gentle oscillation movement to incise the skin without cutting the hair shaft (C), pull the hair shaft to expose the excised FU (D), and remove the FU with forceps as you would for any regular FUE (E).



PREVIEW LONG HAIR FUE DEVICES

Since the inception of the PLH-FUE technique, numerous devices and punches have been developed to enhance outcomes. Among the most commonly used are Harris’s SAFE device, which features a rotational mechanism with a blunt punch, and the Trivellini device, which consists of a multi-phasic apparatus assisted by aspiration, allowing for different motions in each phase, including rotation and oscillation.^{16,17} However, the most significant advancement has been the creation of the ring punch (Figure 3), which includes small blunt indentations (similar to the Schambach notch) that capture and protect the hair shaft while the remaining sharp borders perform the skin incision. Additionally, it has a hexagonal ring that incorporates a certain level of vibration to facilitate a gentle incision.

The WAW device is a wireless multi-phasic device that features oscillation and rotation phases.¹⁸ Its punch designed for long hair FUE—the Tornado punch (with Schambach notches)—further enhances the extraction process by optimizing the handling of long hair follicles. The Tornado punch, characterized by its spiral design with the cutting edge facing away from the FU, enables a controlled and atraumatic extraction of hair follicles, thereby reducing transection rates and improving graft quality.¹⁹ The incorporation of Schambach notches on the punch’s cutting surface (Figure 4) enhances its hair shaft gripping and protecting ability, allowing for secure and efficient extraction of long hair follicles without compromising their integrity.

The UGraft™ Zeus device is a skin-responsive FUE device that utilizes artificial intelligence (AI) algorithms for performing non-shaven long hair FUE, which, coupled with a recess-free punch (the Intelligent Punch®), features a minimal-assist-navigation capability to simplify the procedure and

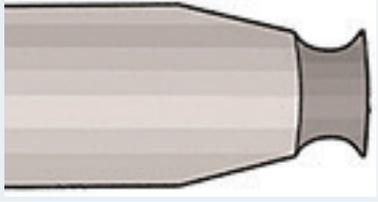
FIGURE 3. Trivellini long hair punch with blunt indentations in the distal edge and hexagonal ring in the proximal portion.



FIGURE 4. Devroye’s Tornado serrated punch, with four equidistant blunt notches that capture and protect the hair shaft while cutting the skin during incision of the FU.



FIGURE 5. Sanusi's advanced hybrid Intelligent Punch of the UGraft, showing flaring, with no recess on its cutting edges or tips. There is texturing of the wall immediately proximal to the cutting edge.



enhances performance parameters, including speed, graft transection rate, hair shaft break rate, and its easy adoption rate by surgeons, including novices (Figure 5).²⁰

ANALYZING THE PROS AND CONS

The long hair FUE technique has both benefits and limitations. FUE is recognized for its minimally invasive approach and ability to extract single hair follicles. It offers distinct advantages, particularly for individuals desiring a natural-looking hair transplant with minimal scarring and faster recovery times. Its ability to harvest donor follicles from various body areas expands candidacy possibilities.

However, among its merits are considerations of prolonged procedure times and potentially higher costs compared to traditional FUE methods.²¹ Additionally, challenges in transplanting long hair grafts may arise, requiring meticulous surgical skills to ensure optimal outcomes. Balancing these aspects is crucial for both patients and practitioners when considering the suitability of the long hair FUE technique for achieving desired aesthetic results. It is essential to take into account factors such as patient preference, donor hair characteristics, and surgical expertise.

The advantages and disadvantages can be classified according to the surgical phase, as noted in Table 1.

TABLE 1. Pros and Cons by Surgical Phase

SURGICAL PHASE	PROS	CONS
Donor Analysis	Visually can determine better thinning (unsafe) areas	Difficulty performing coverage value with regular technique
General Design	Visually easier, can determine different density areas	
Preparation	No need to shave	Surgical field visualization
Excision	Better control of density coverage left in donor areas	Harder to visualize all FUs
		Takes more time
		Specialized punches
Extraction	No burying	Oscillation only devices
	Hair shaft use to expose graft for extraction	Long hair tangling
Graft Preparation	Less partial transection	Accidental pulling from holding cup
	No tissue manipulation	
	Easier to count	If hair too long, grafts can tangle
Placing	Easier to organize	
	Design control	Hairs tangling
	Curvature control	Accidental pulling
	Patient participation	
Post-OP Care	Coverage optimization	
	Immediate-after "temporary" result	
	Back to normal lifestyle faster without evidence of surgery	Accidental pulling while grooming

DISCUSSION

Donor Analysis

Pros: When a patient with long hair undergoes surgery, it is easier to identify the unsafe donor area due to the visual borders delineated by the length of the hair (Figure 6).

Cons: Without shaving the hair, it may be harder to determine coverage value or hair density.

Tips & tricks: To ascertain the coverage value in these

subjects, we offer methodological guidance. To accurately enumerate FUs and follicles per square centimeter, we suggest reducing the assessment area to 20 square millimeters and deriving an average from multiple counts across different donor regions. Measurement of hair shaft width can be taken directly from the scalp or from telogen hairs extracted during patient evaluation. Alternatively, random hair samples can be cut for measurement. These data points can then be logged in a spreadsheet for precise numerical analysis.

General Design

Pros: During the surgical stage of the overall plan, pre-operative assessment of long hair FUE offers two distinct benefits:

1. It facilitates visual assessment for easier delineation of the recipient area, both before and during surgery, especially the frontal hairline. This offers a preview that you can modify trans-operatively if needed (Figure 7), allowing the patient to participate in the final desired outcome.

FIGURE 7. Frontal hairline can be redesigned if needed when looking at the preview result.



2. It enables precise determination of varying hair densities across different areas (Figure 8).

In terms of general design, I have not found a disadvantage as of yet.

FIGURE 8. Comparison delimiting the recipient area with different densities needed.



FIGURE 6. Visualization of the probable superior limit of the safe donor area in a patient with long hair.



Surgical Preparation

Pros: A highly favored advantage of preview long hair FUE from the patient’s perspective is the absence of the necessity for head shaving. This aspect significantly contributes to patient satisfaction and comfort throughout the procedure. Additionally, retaining long hair maintains the individual’s aesthetic appearance, avoiding any temporary alteration that might arise from traditional head-shaving techniques. This feature not only enhances the patient’s experience but also highlights the significance of personalized and minimally invasive approaches in modern hair transplantation techniques.

Cons: One of the primary challenges encountered with this technique pertains to the visualization of the surgical field. The presence of collateral long hair shafts poses a significant obstacle as they obscure neighboring FUs, thereby complicating the visualization of the exit angle of the FU. Moreover, this impediment makes it difficult to accurately center the punch during the procedure. Effectively addressing this challenge will require innovative strategies and meticulous attention to detail.

Tips & tricks: The development of enhanced visualization techniques and precision tools may serve to mitigate these challenges, ultimately optimizing surgical outcomes and patient satisfaction:

- One method involves using Velcro to keep hair shafts from the upper section of the excision line in the donor area from obstructing the surgical field of view. Specifically, the “hook-and-loop” type of Velcro can be used, encircling the head with the rough hook side positioned against the skin in the donor area. This arrangement allows hair shafts to be shifted beneath the Velcro or extracted from it, thereby improving visualization of the skin during the procedure (Figure 9).

FIGURE 9. Excision and extraction of FUs from exposed scalp while observing the proper exit angle.

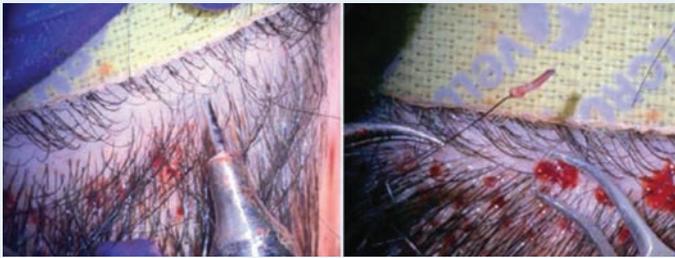


FIGURE 10. Grouped strands of hair measuring about 1cm in width orientation. Photo courtesy Dr. Laura Caicedo.



- Another technique involves using hair clips to organize strands of hair within the donor area. This arrangement of linear hair strands creates space for technicians to extract hair shafts from previously excised strands. This technique, observed during clinical practice, was notably employed by Dr. Laura Caicedo (Figure 10).

Excision Phase

Pros: Another benefit of preview long hair FUE is the enhanced ability to manage the density of remaining hair in the donor area. This technique allows for visual planning during graft removal, enabling precise decisions on whether to continue extracting grafts based on the remaining coverage in the area. This approach supports meticulous control over the distribution and density of hair left behind, contributing to optimized outcomes in hair transplantation procedures.

Cons: During the excision phase, there are several challenges:

- The technique itself is more time-consuming because it involves searching for FUs and correctly centering and angling the punch.
- To avoid damage to hair shafts, specialized punches are required to make incisions in the skin.
- To prevent hair from tangling, an oscillation device is often preferred; however, the author has successfully extracted long hair grafts using the rotational SAFE device and its blunt punch.

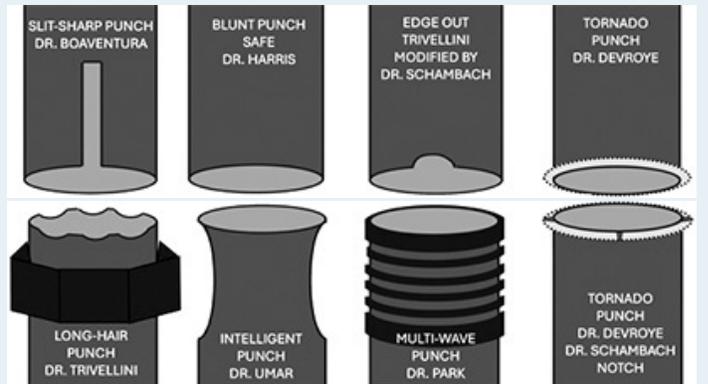
Tips & tricks: To enhance efficiency and precision in performing high-quality excisions, practice is essential. We recommend that you reserve unshaven areas on patients for practice purposes. After completing the excisions in these designated areas, shaving can be done for aesthetic reasons. This method allows the surgeon to refine their technique and optimize their skills in a controlled setting before applying them to the entire surgical procedure (Figure 11).

Specialized punches are recommended, and various designs exist for this purpose. The initial punch introduced for this application was a sharp punch with a lateral slit. The slit serves to accommodate the long hair while making an incision with a sharp edge. Subsequently, the blunt SAFE punch was used by the author for efficient extraction of long hairs. Several companies have developed specific notch designs as well (Figure 12).

FIGURE 11. Note a small patch of long hair left in the donor area for long hair excision practice.



FIGURE 12. Punches used for long hair FUE excision: SAFE blunt punch, Intelligent punch and WAW Tornado punch do not have notches at their cutting edge. The modified blunt punch, Trivellini long hair punch, and WAW Tornado Schambach notch punch have blunt notches on the cutting edge to “capture” and “protect” the hair shaft during excision.



While conventional techniques for harvesting long hair grafts typically involve oscillation devices, the author has previously employed the SAFE rotational device with its blunt punch for this purpose. I recommend that the surgeon hold the hair shaft gently to prevent tangling around the punch during excision while also giving it room to travel alongside the incision.

Extraction Phase

Pros: Although most of the grafts appear to be popping out of the skin (Figure 13), we have seen that the long hair FUE technique has provided improvements in terms of burying the graft, since the hair shaft remains within the punched hole in the skin (Figure 14).

FIGURE 13. Grafts popping out of the skin readily for extraction.



FIGURE 14. How to perform the long hair FUE technique (blue circle): start with punched hole with a long hair graft in it (A), pull hair shaft and expose distal portion of graft (B), and extract graft (C).



Cons:

- You need to search for long hair grafts in an already compromised surgical view.
- Long hair can tangle during the graft extraction process.
- When moving hair to the holding cup, grafts can be accidentally pulled from it.

Tips & tricks: To avoid exceptionally long hair grafts from tangling, the first choice is to trim the hair to a length of 5-7cm after excising and isolating the grafts from the patient. The extraction and transportation of grafts to the holding cup can be quite chaotic. A helpful tip is to create your own “long hair safe finger cups” using common items found in your office, such as finger cups, examination gloves, and scissors. Simply cut the tip off one finger of the glove to cover the finger cup. Next, inject a holding solution into the cup and create a small slit in the glove surface to facilitate placing the grafts inside while keeping the hair shafts outside (Figure 15).

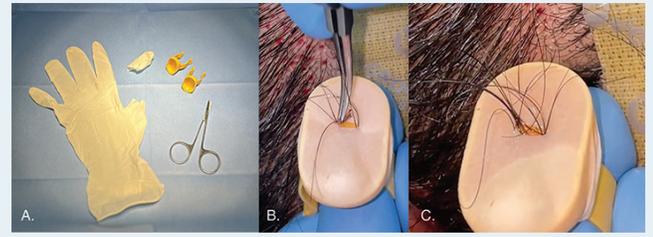
Graft Preparation Phase

Pros: With long hair grafts, there is no need to manipulate tissue. We have found that counting and graft organization seem easier.

Cons: If the hair shaft is too long, we encounter hair tangling.

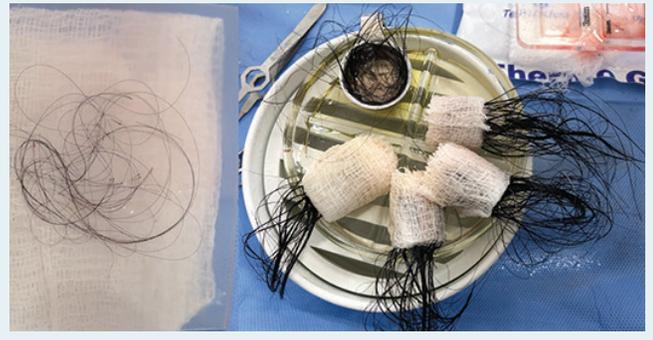
Tips & tricks: Cutting hair shafts to 5-7cm is advisable. This length provides sufficient coverage for design purposes while

FIGURE 15. Materials needed for the “long-hair safe finger cups” (A), placing long hair grafts in the holding cup (B), grafts inside the finger cup, leaving hair shafts outside (C).



remaining short enough to avoid interfering with the process. Another trick we like is organizing the hair shafts in one direction and then rolling them in a wet gauze with the appropriate holding solution (Figure 16).

FIGURE 16. Long hair grafts tend to tangle (left), so we arrange them in a single direction and roll them into bundles of gauze that have been chilled and moistened in holding solution.

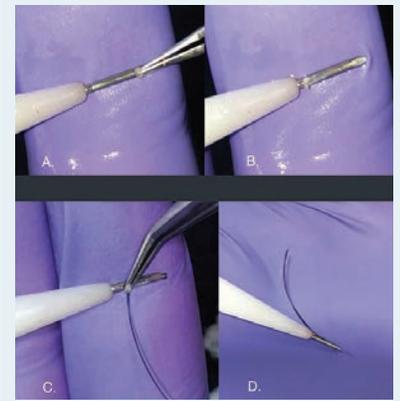


Placing phase

Pros:

- Patients appreciate having control over the design and coverage. The limited resource of grafts can be placed in key areas as needed.⁷
- When using implanters, the technician can control and direct the curvature as necessary, compared to regular shaved grafts, where the technician and the surgeon can only assume the curvature direction (Figure 17).³
- In cases where curvature control is essential (such as eyebrows), long hair grafts that are placed incorrectly can be repositioned trans-operatively (Figure 18).

FIGURE 17. Short hair graft loading into implanter (A), curvature “assumed” within the implanter by observing the position of the sebaceous gland (B), long hair graft loading into implanter (C), curvature observed directly providing the direction of placement needed (D).



Cons, tips & tricks: Hair tangling and accidental pulling on neighboring long hair grafts are always issues, which is why we suggest always starting the placement of grafts from the hairline towards the back, as you can leave the hair shafts out of the surgical view (Figure 19).

FIGURE 18. Observe the incorrect curvature while placement during eyebrow restoration, which can be corrected (A); after visualization (B).

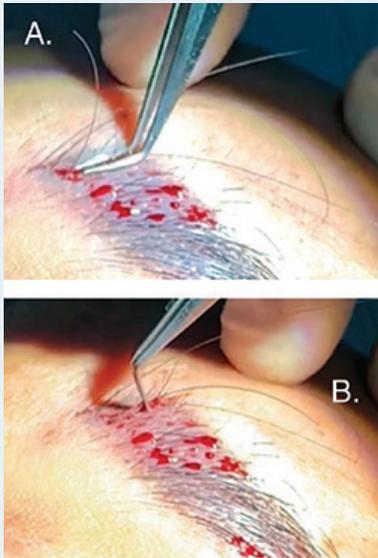


FIGURE 19. Start placing long hair grafts at the frontal hairline and move backwards. The grafts should face forward so that they are away from your surgical view, and the need for manipulating them is reduced.



FIGURE 20. Observe how a simple comb can easily pull the graft out of its site.



- For patients who have long hair, always recommend they comb from the middle downward.
- Most of the styling can be done with a hair dryer and with the hands during the first week.

Post-Operative Care

Pros:

- The immediate “temporary” result may be seen as both an advantage and a disadvantage. The patient experiences a positive feeling right after surgery since they get a glimpse of how it will appear after a year; nevertheless, patients go through anxiety and anguish once they start losing that hair a month after surgery.
- Another very “sought by the patient” advantage of this technique is that patients can go back to their normal lifestyle faster due to the lack of “evidence” that surgery was performed.

Cons: The surgeon must be meticulous in explaining to the patient how to care for the transplanted hair after surgery, especially in terms of grooming and styling. Pulling on this hair during the first week can cause the grafts to fall out (Figure 20).

Tips & tricks:

- The first wash should be done in the office, and patients should receive detailed instructions on hair washing.

Final Result

Pros & cons: Since the immediate post-op result is just a preview of what the transplant might look like after a year, there can be three possible outcomes:

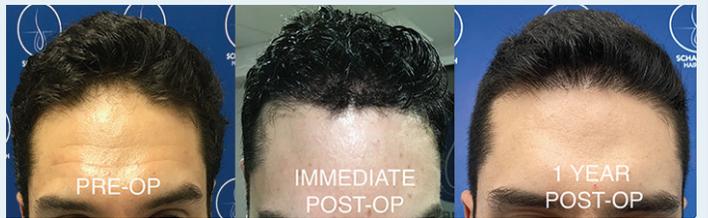
1. There is the same coverage immediately post-op and one year after surgery.
2. There is better coverage at one year post-op than in the preview; this usually happens because many of the healthy long hair grafts have one or more “cut hair shafts” that do not contribute to the preview; however, after a year, these grow and provide even more coverage (Figure 21).

FIGURE 21. Comparison of pre-op, immediate post-op, and 1-year post-op photos showing an increase in hair density at the final result compared to the immediate post-op preview.



3. There is lesser coverage at one-year post-op than the preview; this usually happens when the immediate post-op is not well cleaned and a lot of crusts remain for the photo, which gives an impression of higher density that obviously won't be visible after a year (Figure 22).

FIGURE 22. Comparison of pre-op, immediate post-op, and 1-year post-op photos showing a decrease in hair density at the final result compared to the immediate post-op preview.



Tips & tricks:

- Always verbally explain to patients the possible outcome scenarios and follow this with a written summary.
- Take still photos and active combing videos with dry and wet hair.

THOUGHTS AND PEARLS

This comprehensive review has highlighted both the promise and challenges of the preview long hair FUE technique. By harnessing the innovative technology available today and clever, thoughtful tips, practitioners can achieve remarkable precision and patient satisfaction through enhanced donor area management and recipient-site aesthetics. However, as with any evolving procedure, careful consideration must be given to the learning curve associated with mastering this technique and the potential for increased procedure time and cost. Nonetheless, with diligent practice and the tips and tricks mentioned, physicians and their teams can effectively navigate these challenges, ultimately optimizing outcomes for their patients.

Looking forward, the future of preview long hair FUE appears promising, poised to further refine and elevate the standards of hair restoration surgery. Continued research and collaboration will be pivotal in expanding the boundaries of this technique by addressing current limitations and exploring its application in diverse patient populations. As this methodology evolves, integrating feedback from practitioners and patients alike will be crucial in fostering innovation and ensuring continued advancement. By embracing these advancements while respecting the principles of patient-centered care, we can collectively propel the efficacy and accessibility of hair restoration treatments to new heights, enhancing quality of life for individuals seeking aesthetic and functional solutions to hair loss.

References

1. Rassman W, et al. Follicular unit extraction: minimally invasive surgery for hair transplantation. *Dermatol Surg.* 2002;28(8):720-727.
2. Pitchon M. Preview long hair transplantation: an immediate temporary vision of the best possible final result. *Hair Transplantation Forum Int'l.* 2006;16(4):113-119.
3. Bouhana, P. Long hair grafts: 20 years of experience. *Hair Transplant Forum Int'l.* 2007;17(4):127-128.
4. Boaventura, O. Long hair FUE and the donor area preview. *Hair Transplant Forum Int'l.* 2016;26(5):200-202.
5. Otberg N, et al. Review of the 25th ISHRS World Congress—Prague, Czech Republic. *Hair Transplant Forum Int'l.* 2017;27(6):246-251.
6. Wasserbauer S, Devroye J, Wolf B. Meeting Review: Review of the 2018 World Live Surgery Workshop, March 8-10, at Dubai Healthcare City. *Hair Transplant Forum Int'l.* 2018;28(2):69-75.
7. Schambach M. Shaved FUE vs long hair FUE: a comparative study during excision, extraction, and placement. *Hair Transplant Forum Int'l.* 2020;30(4):117-126.
8. Schambach M. The value of long hair preview in body hair transplantation. *Hair Transplant Forum Int'l.* 2022;32(6):202-206.
9. Umar S. A novel follicular unit excision device for all-purpose hair graft harvesting. *Clin Cosmet Investig Dermatol.* 2021;1657-1674.
10. Park JH, et al. Long hair follicular unit excision: personal experience. *Int J Dermatol.* 2021 Oct;60(10):1288-1295.
11. Velasco M, et al. Hair fiber characteristics and methods to evaluate hair physical and mechanical properties. *Braz J Pharm Sci.* 2009;45:153-162.
12. Gummer CL, Vogt A. Mechanisms of Hair Breakage. In: *Textbook of Trichology.* Springer: Cham, 2019; pp. 87-98.
13. McArthur JR. The Integumentary System. In: *Skin and Systemic Disease.* Springer: Berlin, Heidelberg, 2008; pp. 1-32.
14. Johnson MI, Tabas JA, Abu-Omar YM. Techniques of skin biopsy and practical considerations. *J Invest Dermatol.* 2015;135(4):e21.
15. Otberg N, et al. Review of the 25th ISHRS World Congress—Prague, Czech Republic. *Hair Transplant Forum Int'l.* 2017;27(6):246-251.
16. Harris JA. New methodology and instrumentation for follicular unit extraction: lower follicle transection rates and expanded patient candidacy. *Dermatol Surg.* 2006;32(1):56-62.
17. Trivellini R, Perez-Meza D. Preview long hair transplantation with donor harvesting using the follicular unit excision technique. *Hair Transplant Forum Int'l.* 2022;32(1):11-16.
18. Devroye J, Wawrzynski J. The WAW system: a new method to improve quality in follicular unit extraction. *Hair Transplant Forum Int'l.* 2015;25(6):218-220.
19. Jones R, Smith T, Johnson A. The Tornado punch: an innovative tool for follicular unit extraction in hair transplantation. *JHRS.* 2018;8(2):75-80.
20. Umar S, et al. No-shave long hair follicular unit excision using an all-purpose skin-responsive device. *Clin Cosmet Investig Dermatol.* 2023;16:3681-3691.
21. Schambach M. Hair Transplantation. In: Unger EWP, et al. Eds. *Hair Transplantation*, Fifth edition. (pp. 522-527). Thieme, 2023; pp. 490-495. ■

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