

What's New in Facial Hair Transplantation?

Effective Techniques for Beard and Eyebrow Transplantation

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KEYWORDS

- Facial hair transplantation • Hair restoration • Beard transplantation • Eyebrow transplantation
- Follicular unit extraction (FUE) • No-shave follicular unit extraction

Q5 KEY POINTS

- Advances in hair transplantation techniques allow natural results in facial hair transplantation to be achieved.
- Poor hair growth angulation can occur occasionally despite the best efforts in acute recipient site angulation and hair placement.
- Eyebrows will start to regrow around 4 to 6 months after transplant and will continue to fill in for a full year, gradually increasing in density.

INTRODUCTION

Advances in hair restoration techniques have made it possible to transplant hair in nonscalp areas of the face such as the beard and eyebrows. Refinements in techniques have allowed for the transplantation of beard hair and eyebrow hair with natural appearing results. Thick eyebrows and full beards are in vogue. Pick up any of the latest fashion magazines and you see female models with thick, full eyebrows, or men sporting beards. Our practice has seen a large increase in the demand for beard and eyebrow transplantation. This article describes the preoperative consultation, operative technique, and postoperative care developed from our experience of over 1000 procedures in facial hair restoration.

BEARD TRANSPLANTATION

Preoperative Planning

Most patients seeking facial hair restoration are men with a genetic paucity of facial hair (Fig. 1).

Other reasons for patients seeking facial hair restoration are for poorly thought out previous laser hair removal, scarring, burn, or cleft lip repair (Fig. 2). Another small group are female to male transgender patients seeking a more masculine appearance. Treatment goals in beard restoration are often set by the patient. Patients typically present with a rather specific understanding of how they want their facial hair to appear. A patient's goals may vary from increasing the density of an existing beard while maintaining the same shape, to transplanting full beards where few hairs exist. The design and density of the beard may be limited by the quality and quantity of the donor area. Transplantation of full beards requires a large amount of grafts and patients are always made aware of the possibility of undergoing secondary procedures after 1 year if further density is desired. These grafts, it must be made clear, once transplanted, will no longer be available for use in the scalp in the future if male pattern hair loss is to develop.

Disclosure Statement: The author has nothing to disclose.

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Facial Plast Surg Clin N Am ■ (2019) ■--■

<https://doi.org/10.1016/j.fsc.2019.04.003>

1064-7406/19/© 2019 Published by Elsevier Inc.



Fig. 1. Male patient with a paucity of facial hair presenting for beard hair transplantation.

With the advances and refinements in follicular unit extraction (FUE) techniques, most patients seen in our office elect to have the procedure performed in this manner to avoid a linear scar, allowing them to maintain a short hairstyle.^{1,2} FUE has largely replaced the traditional strip donor extractions for beard transplantation in our office.^{3,4} Regardless of the donor technique used, patients are made aware of the potential limitations of the donor hair quantity and therefore “size” and density of the beard that can be achieved through a single procedure. It is our experience that the scalp hair transplants to the face have a high regrowth percentage and, if properly performed, patients can achieve a natural outcome. As in any cosmetic procedure, listening to the patient’s exact goals and desires is imperative. Patients who desire facial hair restorations, in general, express a specific desire for how they want their beard designed. Depending on the exact design and density, graft counts can range from 250 to 300 grafts to each sideburn, 400 to 800 grafts to the mustache and goatee, and 300 to 500 grafts per cheek. These numbers can vary based on the pre-existing hair, design, and thickness of the donor hair.



Fig. 2. Beard transplantation is an option for male patients to help camouflage facial scars.

As with other hair transplantation cases, patients need to be in good general health and off medications, supplements, and vitamins that can worsen bleeding.

Surgical Preparation

As mentioned, most patients have a specific idea about the design they wish for their facial hair. Using the patient’s guidelines, the areas to be transplanted are marked out using a surgical marking pen with the patient in a seated position. The markings are checked for symmetry between the 2 sides. Measurements are used to help ensure symmetry. Patients are shown the markings in a mirror, in case the 2-dimensional perspective provided by a mirror—which is what the patient sees in a mirror—is different than what the surgeon sees in direct three dimensions. If then needed, alterations are made according to patient desires (**Fig. 3**).

Procedural Approach

Currently in our practice, the vast majority of patients seeking facial hair restoration elect to have their procedure using the FUE technique to avoid a linear scar. In these cases, the donor area is usually shaved (a no-shave FUE alternative is also offered), and the patient is placed in a supine position. The donor area is prepped and draped in a sterile fashion for the procedure. Local anesthesia is infiltrated into the donor area. The smallest possible drill size avoiding graft transection is used for the extractions. The donor area consists of the occiput only in smaller cases and extends into the parietal scalp for larger cases. Graft extractions are evenly distributed throughout the donor area to avoid areas of focal alopecia. Once the extractions have been completed from the occipital area, the patient is then turned to lie in the supine position.



Fig. 3. Patients are marked in the preoperative suite before facial hair transplantation where they are shown the outline and design of the beard.

Local anesthesia is then applied to the face starting in each sideburn and cheek area. The area around the mouth is not anesthetized at this point; the area around the mouth is typically worked on after the patient has eaten lunch. The recipient sites in the sideburn and cheek area are made first. The smallest possible recipient sites are made using 0.5-, 0.6-, or 0.7-mm slits. The 1, 2, and (if used) 3 hair grafts are tested to ensure size compatibility with the recipient sites. In the periphery of the sideburns, 1 hair graft is used whereas 2 hair grafts can be placed in the central aspect of the sideburn to allow for more density (Fig. 4). Counter traction is provided by the nondominant hand and an assistant while making the incisions. The key esthetic step is to make the incisions at an ultra-acute angle to the skin, with the direction of the incisions determined by either existing surrounding hairs or the fine “peach fuzz” of the face. This being said, the direction of growth is generally downward, but more centrally closer to the mouth/goatee region can be somewhat anterior. In the cheek area, 3 hair grafts are sometimes used in the central beard in patients with finer hair to allow for the achievement of greater density without a compromise of naturalness. If further grafts are needed, they are extracted at this time from the parietal scalp. The patient’s head is slightly turned, allowing for the simultaneous extraction of grafts from the parietal area and the placement of grafts in the ipsilateral cheek and sideburn.

After the patient is given lunch, the area around the mouth is then anesthetized. Infraorbital and mental nerve blocks are used to provide initial anesthesia. Anesthesia in the goatee and mustache area is then reinforced with field subdermal local anesthesia complemented by epinephrine 1:60,000 to minimize bleeding. Incisions in the goatee and mustache area are then made. On the mustache, hairs will grow slightly laterally

and then transition downward along the goatee. Patients need to be made aware of the difficulty in creating density along the entire mustache, particularly centrally within the “Cupid’s bow.” The creation of density in this area is difficult owing to the undulations created by the upper lip’s Cupid’s bow area. It is also important to maintain as acute an angle as possible in this central area of the upper lip because grafts have a tendency to grow straight outward in nonacute angles. The transition from the mustache to the goatee is an important area for the creation of density, which is usually created by the maximal dense packing of 2 hair grafts.

The grafts are placed into these recipient sites using jeweler’s forceps. Counter traction splaying the incision sites open with the nondominant hand helps in the placement of the grafts given the laxity of facial skin. The importance of having experienced assistants for this process is critical, as they need to understand the “pattern” of graft distribution, as created by the surgeon. Toward the conclusion of the procedure, the patient is given a mirror before all grafts are placed. Given that the immediate results closely replicate the final results, it is helpful for the patient to view their beard to assess the design and density of the grafts. This allows for feedback, fine-tuning, and alteration before the conclusion of the procedure (Fig. 5).

Postprocedure Care

Patients are told to keep their face dry for the first 5 days after the procedure. This allows for the grafts to set properly, helping to assure the maintenance of proper angulation. Topical antibiotic ointment is applied to the donor area. Patients are then to wet their face with soap and water,



Fig. 4. Image demonstrating the typical graft size placement for beard transplantation.



Fig. 5. Immediate postoperative results where patients are able to see their beard design.

starting to remove the dried blood and crusts. Shaving is permitted after 10 days. Hair regrowth usually starts around 4 to 6 months. The transplanted hair can be treated as any other facial hair and allowed to grow out or shaved. Most patients are satisfied with the initial density from 1 procedure but a secondary, touch-up procedure, can be performed after 1 year to create further density.

Potential Complications and Their Management

Poor angulation

Hairs can grow out perpendicularly giving the beard an unnatural appearance. As previously mentioned, the area of the face where improper angulation poses the greatest challenge is in the mustache. To avoid the improper angulation it is helpful to use the smallest possible incision at an acute angle. It is helpful to use a longer blade so as to allow it to lay flat across the skin permitting a sharply acute angle. If needed, the perpendicular hair grafts can be removed via the FUE technique and the resulting hole is left to heal by secondary intention.

Bump formation

Tiny bumps can form, particularly under the lip in the “soul patch” and chin mound areas at the site of the transplanted grafts. The cause of the formation of these bumps is not known; however, this is mostly seen in patients with thick, dark hair. As the hair grows in this soul patch and chin mound area, a small bump can form where the hair exits the skin. For this reason, if a patient desires hair in these regions, a small “test” procedure can be performed at the time of the initial procedure, or alternatively, only single-hair grafts trimmed of surrounding skin can be used safely. If, in 6 to 8 months, no bumps have formed then further hair can be transplanted.⁵ Patients of Asian ethnicity, particularly those with dark thick hairs, are the most challenging on whom to avoid complications, both in this bump formation, but also in achieving naturalness owing to the difficulty in getting the grafts to look natural, particularly in angulation. With these Asian patients, the less-experienced surgeon is strongly encouraged to proceed conservatively, with the primary use of all single-hair grafts and a smaller number of grafts, until proficiency is achieved.

EYEBROW TRANSPLANTATION

Preoperative Planning

The goal in eyebrow restoration is to restore the desired shape and density, and natural direction

and angle of growth of eyebrow hair. The most common presentation in women is the thinning of the eyebrows, either from over-plucking, aging, or genetic causes. In cases of complete eyebrow absence, types of alopecia (such as alopecia totalis) need to be ruled out before considering transplantation.⁶ Men typically lose the lateral aspect of the eyebrows with aging and are seeking overall thicker eyebrows. Some of our female patients have had previous permanent makeup, and are advised that this may compromise regrowth in the occasional case. These tattoos can often help guide the design of the eyebrows, but oftentimes we find that they were made asymmetrically and/or not esthetically. Most of our female patients are able to draw their desired eyebrows, which we encourage, but then often require some fine-tuning by the surgeon to create a nicer look.

The donor hair is almost always the scalp because of its reliable regrowth, although other areas of the body can be used as well, but the regrowth is not as reliable, nor is supply often readily available. In most cases, scalp donor hair extraction is performed from a small “strip” from the occipital scalp. The strip technique allows for the hair to be maintained slightly longer as it exits the skin, allowing for the visualization of the direction of growth of the hair. In some cases, particularly in men, the FUE technique is used. Overall, given the small number of grafts needed, patients are given the option of the “no-shave” FUE technique so that they can avoid the trimming of the donor area and maintain their hair longer.

Surgical Preparation

Patients are seated in front of a mirror in the preoperative suite. Women generally have a good idea of the shape they desire for their eyebrows. They are asked to bring in photos of “model” eyebrows to help guide their design. After preoperative photos are obtained, if the patient has a good idea of the shape they desire, they are offered an eye-liner pen and are given the time to draw in their desired eyebrow shape. The patient’s active involvement in the design of their eyebrows is important. After they are given some time to design their eyebrows, final markings and refinements are made by the surgeon with a semipermanent fine marker. Measurements are taken for symmetry. Men seeking eyebrow restoration typically are seeking to fill in areas within the eyebrows that are lacking density. The male eyebrow is designed with less of an arch and as an extension of the existing eyebrow. Photos are obtained after the final markings have been made.

The author likes to divide the eyebrow into 3 sections:

1. Head (innermost 5–8 mm)
2. Body (central 2.5–3.5 cm)
3. Tail (outer 2–2.5 cm)

In women, the point at which the tail and body meet forming the arch is usually located at or just lateral to the lateral limbus of the eye. For a more dramatic look, this arch can be as far lateral to the lateral canthal region. However, it can vary in position and roundedness. In men, the arch of the brow is not so much as a peak but rather a widening of the eyebrow along the area correlating to the lateral limbus. This is best demonstrated in **Fig. 6**.

Procedural Approach

If a strip harvesting technique is to be used, the patient remains in the upright, seated position for the excision. The strip is typically harvested from the occipital scalp and, depending on the number of grafts needed, varies in length and width from about 3 to 5 cm and 10 to 15 mm, respectively. If the FUE technique is used, the patient is placed in the prone position for donor harvesting. Given the smaller number of grafts needed, shaving of the entire donor area can be avoided. Once the donor hairs have been harvested the patient is then positioned in a supine “beach chair” position for incision site placement. Highly experienced technicians perform the dissection of the harvested donor hairs under the microscope, under the supervision of the surgeon. Naturally occurring 1- and 2-hair follicular units are dissected, although, in some cases, 3 hair follicular units are used to achieve maximal density without compromising naturalness.

The eyebrows are anesthetized, and 1:50,000 epinephrine is injected for hemostasis. Recipient

sites are created by the surgeon using the smallest blade size appropriate for the grafts, most commonly 0.5 mm, but sometimes 0.6 mm for the occasional larger 2 hair grafts and even 3 hair grafts. Recipient sites are first made along the boundaries of the eyebrow along the preoperative markings, as these markings can be lost with the subsequent bleeding and wiping of the blood from the recipient sites. Paying attention to the proper direction of growth is critical. Within the head of the eyebrow, hair usually grows in a more vertical/superior direction. Moving from the more inferior to the more superior aspect of the head of the brow the hairs quickly change direction to grow in a more horizontal then inferior/downward direction, particularly along the superior border. Moving laterally, the hairs along the superior border are oriented in an inferior/downward direction, while the hairs along the inferior border are oriented in a superior/upward direction, creating a herring-bone pattern (**Fig. 7**). This cross-hatching continues throughout the body of the eyebrow until the tail portion, where the hairs then are primarily oriented horizontally. Incisions are made as flat (acute an angle) as possible to the skin (**Fig. 8**). Once all the recipient sites are made bilaterally, the grafts are then inserted. Care is taken to orient the hairs so that the direction of growth (ie, the curl) of the hair is in an acute angle with the skin. We like to place as many 2-hair grafts as possible, except along the innermost head and lateralmost tail portion, where 1-hair grafts are used. If 3-hair grafts are deemed appropriate, they are placed in the central aspect of the body portion, to achieve maximal density. It is critical to make just about all of the recipient sites before any planting is to be done, then, after all these recipient sites are filled with grafts, the patient is asked to sit up and the eyebrows are inspected; small adjustments can then be made with the placement of more grafts. The patient can then view the eyebrows to obtain his/her feedback regarding symmetry and the desired shape.



Fig. 6. Male eyebrow demonstrating the lateral thickening over the area of the lateral limbus.



Fig. 7. Image demonstrating the direction of eyebrow graft placement and the size of the grafts.



Fig. 8. Incisions are made in an angle as acute as possible to the skin.

Potential Complications and Their Management

The most common complications related to eyebrow hair restorations are asymmetry, rather than anticipated hair regrowth, and poor hair angulation. It is important when marking the eyebrows that symmetry is checked and rechecked. It is also helpful to view the immediate photo once the markings have been made. The viewing of the photos helps to provide a “third” eye and different perspective, often revealing asymmetries that may not have been immediately apparent. As mentioned previously, recipient sites are first made along these markings, along the boundaries of the eyebrow, before they can be rubbed off and lost. The local anesthesia and the swelling can create asymmetries during the procedure, making 1 eyebrow appear higher than the other and thus creating artifactual asymmetric appearances that are more difficult to correct at the end of the procedure. To limit this phenomenon, it is best to administer the local anesthetic at the beginning of the case and to have the patient sit up to check for symmetry before adding more local anesthetic during the procedure.

Another potential complication is related to poor eyebrow density. This is most likely because of lower than expected percentage of hair regrowth. Despite the best efforts to keep the grafts moist, as well as the atraumatic placement of the grafts, in certain cases 20% to 25% of the hair may fail to regrow. To minimize poor regrowth rates, the grafts are kept “chubby” with a small cuff of surrounding protective fat, and the most experienced assistants perform the insertion of the grafts. Patients are advised that this is not necessarily a complication, but rather something that simply sometimes occur, and thus a second smaller

procedure can be performed after 10 months or more to achieve greater density.

Lastly, poor hair growth angulation can occur in the occasional case despite the best efforts in acute recipient site angulation and hair placement. This is likely because of the effects of healing and subtle wound contracture. It is most commonly seen in patients with straight hair, in whom the harvesting of the natural curl to assure flat growth of hairs is difficult. To best prevent this, an acute angle is taken with the skin when making recipient sites and rotating the hair on insertion, so that the natural curl of the hair is aimed downward. It is also best not to trim the hair in the donor area—if by strip method—to better visualize the hair curl.

Postprocedure Care

Patients are instructed to keep the eyebrows dry for the first 5 days. If strip harvesting was performed, sutures are removed approximately 10 days postoperatively, or the dissolvable sutures are expected to be gone by 4 weeks. Antibiotics and pain medications are given for the first several days. Patients are allowed to use makeup in the eyebrow area after all the crusts have fallen out at typically 5 days.

Eyebrows will start to regrow 4 to 6 months after transplant and will continue to fill in for a full year, gradually increasing in density. A variety of products can be used to train any misdirected hairs. The hair must be trimmed to the patient’s desired length. If a patient so desires, second smaller procedures to increase density are performed 10 months or later.

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