

Hair Restoration in the Ethnic Patient



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KEYWORDS

- Hair restoration • FUE hair transplantation • Hairline-lowering surgery • Eyebrow restoration
- Beard transplantation

KEY POINTS

- Understanding the ethnic variations in hair and scalp characteristics and the ideals of beauty are very important in managing hair loss with hair restoration.
- Hairline-lowering surgery is particularly effective and indicated in shortening the overly high female hairline in black women.
- Hair restoration surgery whether to treat pattern hair loss or overly high hairlines can be effective in all ethnic groups.
- Hair transplantation to restore overly thin beards or eyebrows can provide esthetic results when attention is paid to achieve flat angulation of hair growth and through the use of primarily 1 and 2 hair grafts.
- The most challenging ethnic groups on whom to perform eyebrow and beard transplantation are those of Asian ethnicity due to the coarseness and straightness of the scalp donor hairs.

INTRODUCTION

It was 8 years ago that I lead authored for the Clinics a similar article, entitled “Ethnic Considerations in Hair Restoration Surgery”.¹ At that time I acknowledged the growing number of non-European/nonwhite patients undergoing hair procedures, consistent with the ever-expanding mosaic of ethnicities in North America and Europe that was acknowledged by the other authors in the issue of the Clinics 8 years ago, and is ever more relevant today. This is an evolution every-bit as seen in plastic surgeons’ offices as in the Main Streets of cities and towns. Although still “Hispanic-rich,” Miami’s identity is no longer synonymous with Cubans (who are both white and black Caribbean) but the full spectrum of nearly every ethnic group drawn not only to reside where others vacation but also coming from throughout the world drawn to visit surgeons

with strong online presences and reviews that usually reflect excellent work—a phenomenon experienced by my colleagues practicing not only in large cities but also in smaller towns. This global plastic surgery tourism that benefits surgeons committed to excellence is a counter to the similar yet opposite tourism that leads patients to travel to certain recognized plastic surgery destinations where the draw is primarily bottom-shelf low fees. For example, in Turkey, it is estimated that more than \$2 billion hair transplantation services are provided annually, an income stream encouraged by a government whose loose regulations of this surgery permit clinics to operate without a physician, rather staffed only by hair technicians.^{2,3}

Understanding the ethnic variations in hair and scalp characteristics, various inherent risks of surgery, ideals of beauty, and even the motivations for seeking treatment are as important in treating hair

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loss as it is in any other esthetic surgery specialty, to assure optimal results, and given our multicultural world, it is not an understatement to say it is critical. It is important right from the start for the surgeon to learn whether the patient is seeking to enhance or at least maintain certain ethnic features (eg, high hairline in east African women, short eyebrows in Asians), or seeking to homogenize with more conventional Western ideals of beauty. In the hair restoration field, significant and continued improvements in techniques and outcomes have provided inclusion as a plastic surgery subspecialty, with equivalent esthetic natural outcomes. In particular, the most significant advances in these techniques and outcomes over the past 8 years since this article was first published has been the enhancement of follicular unit extraction (FUE) harvesting and planting devices that assure higher rates of hair regrowth, the expansion of the supply of available donor hairs using these FUE techniques from the beard in particular and also other body hair, and finally the growth in popularity and improvement in techniques of hairline-lowering surgery (HLS) as an alternative in appropriate patients to hair transplantation to shorten the overly high forehead. Along with these advances in techniques over the past 8 years are 2 advances in medical management of hair loss, first the growing recognition (or maybe the growing incidence) of scarring alopecias frequently imitating androgenic pattern hair loss as well as playing a role in explaining cases of poor hair transplant results, and second the developments in nonsurgical therapies.

Ethnic considerations play a variety of roles in hair restoration surgery. First, esthetic ideals and patient motives reflect cultural norms in those seeking to enhance rather than minimize ethnicity, a trend that has only increased in recent years as people take growing pride in not only individual sexual orientation but also religious and ethnic qualities. Some examples include how Middle Eastern women desire prominent eyebrows or men seek full beards, or how Asian men seek limited beards, or how black men seek flatter hairlines or black women particularly of east African ethnicity are more likely to accept higher but not excessively high hairlines. Similarly, motives for surgery must be understood and culturally respected, for example, how East Indian males (particularly those from the country of India where arranged marriages are expected) will prioritize more youthful fuller hairlines today to obtain a more desirable spouse and disregard the risk of a future of an unaesthetic appearance with further hair loss, or how Middle Eastern men must have a full beard to be viewed as sufficiently masculine.

Important Concepts in Ethnic Differences in Hair Characteristics

The 5 major aspects of human hair

Human hair is generally categorized into 3 major groups based on ethnic origin: Asian, Caucasian, and African. There are 5 major aspects of human hair that vary among each ethnic group. These 5 are mechanical properties, pigmentation, cross-sectional area, curvature, and density. Before discussing these differences, it is helpful to understand the structural components that make up hair and how they differ among the 3 ethnic groups. The hair shaft is mainly made up of keratin materials and consists of 3 layers—the cuticle, cortex, and medulla. In the center lies the medulla, surrounded by the cortex, which is the principal structure of the hair shaft. Outside the cortex lies the cuticle, which functions as a barrier against physical and chemical damage.

Mechanical properties

The hair of the different ethnic groups has different mechanical qualities. Asian hair possesses the most hardness and elastic potential, followed by Caucasian and African, respectively, with damage at the cuticle reducing both characteristics at the hair tip in all 3 hair types.^{4,5} When observing the hair of those with African descent, one notes the commonality of hair shaft abnormalities due to the fragility of African hair and disruptive hair styling.⁵ Stretching of hair can distort hair structure as well as its properties⁵; this likely explains the greater susceptibility to traction alopecia in black patients. Asian hair has greater stability than Caucasian hair due to its larger diameter.^{6,7}

Pigmentation

Dark hair has a high concentration of eumelanin and a low concentration of pheomelanin, whereas the opposite can be seen for blond hair with very little eumelanin and only a trace of pheomelanin. Hair pigmentation is also influenced by the size and density of melanosomes in a hair strand. Thus it is seen that the hair of African descendants has a larger melanosome size and density than the hair of Caucasians and Asians and thus they rarely have lighter hair types.

Cross-sectional area and shape

Among the 3 common human hair types, Asian hair has the largest cross-sectional area and the most circular cross-sectional form.⁸ However, between those of East Asian descent we do not see much of a discrepancy between hair thickness. For example, on average, those of Chinese descent had an average hair diameter of 89 μm , Japanese had 86 μm , and Korean had 89 μm .⁹

However, when we compare those of East Asian descent with those of Indian descent, we do start to see some discrepancies with an average hair thickness of 79 μm for hair type of Indian descent.

We also see African and Caucasian hairs having similar cross-sectional areas with 71 and 73 μm , respectively.⁹ It is also important to note that the follicle shape determines the appearance of the hair. The typical hair follicle of Asian hair is round, whereas those of whites and Africans are ovoid and elliptical, respectively.¹⁰ The shape of the hair follicle is thus believed to contribute to the appearance and the geometry of the hair. Asian hair has a circular geometry, African hair has an elliptical shape, and hair of whites is of an intermediate shape.¹⁰

Hair curvature

The curve of hair varies widely among ethnic groups. Asian hair tends to be the straightest, followed by Caucasian hair, followed by African hair, which is more flattened and curly.^{11,12} Increased curliness seems to be correlated with a smaller total hair density and a lower rate of growth.¹³

Hair density

An important issue when considering ethnic characteristics in evaluating patients for hair transplantation is the density of hair in the donor site. This density is a product of 2 factors: the concentration of hairs and the size or caliber of each individual hair. The concentration of hairs is presented in the form of follicular units (FUs) per square centimeter; a single FU is the natural-occurring grouping of hairs as they grow in the scalp.¹ A FU consists of 1 to 4 hairs, surrounded by an adventitial sheath, which also contains some supportive structures.^{1,14–16} A hair graft typically consists of a single FU, which is the building block of esthetic hair restoration. Asian hair has the largest cross-sectional diameter or caliber, whereas the density of hair is intermediate in whites (whose highest density of hair follicles is 100 FUs/cm²) and lowest in Africans.^{1,5,15} This characteristic may be deceptive to the novice hair transplant surgeon, because African hair gives the appearance of a higher density, given the curly nature of the hair. This characteristic is beneficial to the patient because the appearance of higher density may be achieved with lower graft density in the recipient area. Asians have a high proportion of single hairs (24%–30% compared with 14% found in whites).^{1,5,16}

In Asians, the average number of hairs per FU is 1.6 to 1.8, whereas in Caucasians it is 2.3. The number of FUs/cm² is as low as 60 to 70 in Asians;

however, as previously mentioned, Asians have a higher-than-average hair diameter.^{6,16}

Those of African American, Caribbean South African, and Western African decent actually have the lowest average hair thickness compared with all the ethnicities studied, 71 μm , while still having a slightly higher average hair density than those of Asian descent with 171 hairs/cm².^{13,16} Those of African descent also on average have a hair density of 50 to 70 FU/cm², but because of their curliness, the appearance is very full because it overwhelms the scalp, as touched upon earlier.¹⁷

Those of European decent, namely, Brazilian, Caucasian American, Caucasian Australian, French, Lebanese, Mexican, Peruvian, Russian, and Spanish, had very similar hair parameters and thus were littered together with the highest average hair density of 215 hairs/cm² but without high parameters in hair thickness with 75 μm .¹³

Other characteristics

The Asian scalp has been recognized as having lower laxity than that of Caucasian scalps, allowing the assumption that it could be more difficult to perform HLS,^{6,18} which is described later in this article. Also interesting, owing to the high contrast between the dark hair strands and the pale scalp, straight hair, large hair diameter, and the angle of the hairs that grow more perpendicular rather than obliquely out from the scalp, there is a greater degree of transparency and scalp visibility compared with other hair types.

SPECIFIC PROCEDURES

Follicular Unit Extraction

Although follicular unit transplantation (FUT), or the “strip” technique, warrants mention, FUE is the primary procedure used for hair transplantation in nearly all men and a considerable number of women, due to 1 main advantage—avoidance of a linear donor site scar—and several secondary advantages. These advantages are extremely important and warrant review:

- Avoidance of a linear donor site scar, due to how each graft gets extracted one at a time rather than via a “strip.” The extent of scarring from FUE, characterized by tiny alopecic “dots,” depends on several factors, including the size of the punch, the density of graft extractions (how many grafts are extracted in a single area over 1 or more procedures), how many hairs are left behind unharvested in the donor area, and the uniformity of their distribution and their angulation and curl of growth (eg, Asian hair tends to grow from the scalp in

a more perpendicular direction thus increasing the visibility of these circular scars, whereas the curliness of the typical black hair helps to conceal the scars), and finally the color contrast between the dot scars and the native skin (where darker-skinned individuals have an advantage due to the lower chance of having hypopigmented scars).^{1,7,9} The development of more advanced FUE harvesting devices like the WAW (DeVroye instruments, Belgium) and the MAMBA (Trivellini Instruments, Paraguay) that use oscillating rather than rotary drill movement and hybrid rather than sharp punches where the “fluted” shape has the sharp edge directed outward allow for improved hair regrowth (due to lower rates of undesirable graft transection of typically 4% vs 10%–15% seen with sharp punches with rotary drills) and less scarring of the donor area due to the ability to use smaller punches typically 0.85 mm in diameter^{1,7} (**Fig. 1**).

- Easier recovery, with minimal to no discomfort unlike the first several days of discomfort at the suture line closure of a “strip.” The need to completely shave the donor areas (back and sides of the head) for FUE, although still the most common approach used by most surgeons, can be avoided by surgeons who offer the no-shave FUE technique in which the only hairs trimmed are those that are extracted, a time-demanding meticulous process that has as the major advantage no need for any shaving of the head.
- A greater average number of hairs per FU graft, particularly with the first procedure, than seen with FUT^{1,7}; this is because with FUE it is possible to preferentially harvest the FUs containing 3 and 4 hairs, unlike with FUT in which whatever grafts are dissected from the “strip,” a mix of 1, 2, 3, and 4 hairs, are those with which one has to work.
- Logistically simpler for the hair restoration practitioner, avoiding the need for a large team of hair technicians to do the graft dissection with FUT.
- The ability to harvest grafts from the beard and other body areas. The beard is a particularly valuable donor area, due to the high reliability of hair regrowth and the rapid, typical 24-hour, healing of the donor area.^{1,19} As many as 1200 to 2000 grafts can be harvested from the beard staying below the jawline (**Fig. 2**).
- A reduced total number of available lifetime donor hairs, where estimates range from a mean of 6500 to 9000 total grafts available by the performing of 2 to as many as 5 FUT procedures over a lifetime, versus 4800 to 7000 total grafts available by FUE.^{20,21} It should be noted that it is possible to combine FUE and FUT techniques, whereby the “strip” is taken from the back of the head and FUE is used to harvest grafts from below the “strip” and from the sides of the head, maximizing the total lifetime number of donor grafts to as high as 10,000 or more.
- The partly erroneous claim that hair regrowth is lower with FUE versus FUT. A landmark study demonstrated outstanding regrowth rates from FUE grafts when harvested by experienced hands using hybrid punches, disproving this claim.²²

There are indications for performing FUT in the following situations:

- Women who plan to never shave their head, particularly in those undergoing hair transplantation for androgenic hair loss where the density of donor hairs can be significantly highest in the central back of the head from where the donor strip is harvested.
- Men who already have had a prior FUT who recognize they will never be able to shave the head without the linear donor scar being visible, and who request that FUT be repeated, perhaps seeking to combine FUE to increase the total graft supply. However, it is our experience that due to the easier healing course and the perception that FUE is a less-“invasive” procedure, most patients, even those who have a prior FUT donor scar, will choose FUE for additional work.

It must be recognized that FUE is more technically difficult to perform in certain ethnic groups, particularly in black patients, due to the curl of the hairs that extends beneath the skin; this requires special techniques that oftentimes only highly experienced FUE surgical teams can provide, facilitated by the use of the more advanced FUE systems described earlier. Punch diameter needs to be adjusted depending on the size of the FUs being extracted (a factor of hair caliber and the number of hairs per FU) and the ease of graft extraction (sometimes larger punches can facilitate the intact harvesting of certain difficult-to-extract grafts). Certain ethnic groups have typically larger FUs, thus requiring a larger punch of 0.9 mm or even larger.^{5,20,23} Because in Asians compared with Caucasians the hair follicles are

There are several disadvantages of FUE versus FUT, which include the following:

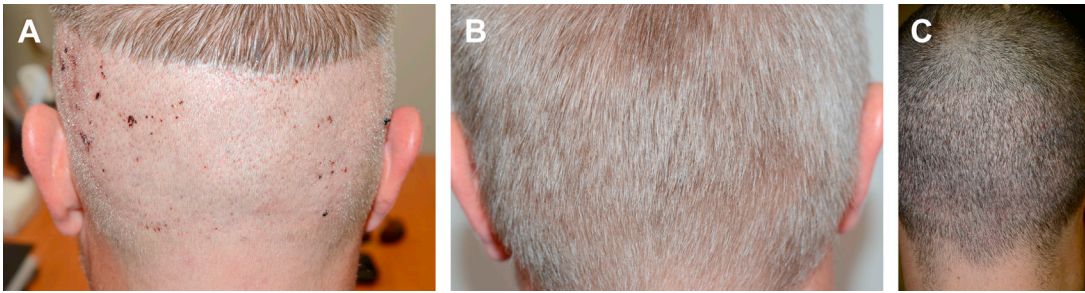


Fig. 1. Patient before (A) and 2 weeks after (B) FUE procedure, and second patient 1 week after (C) FUE procedures.

longer and the dermal papilla that must be cut through to free up the graft extends a bit further from the skin surface, the punch typically must be used to cut a bit deeper.^{1,23,24}

Achieving Naturalness and Meeting Esthetic Goals in Patients of Varying Ethnic Groups

An appreciation for the ethnic variation of desired hairline design must be appreciated to satisfy patient goals. At the same time, realistic expectations, with an accounting of future hair loss, must be factored in and shared with the patient in consultation. Listening to the patient's goals and showing of prior results achieved in similar cases by the surgeon can be invaluable. Inevitably, there are 2 main decisions facing the surgeon-patient team—the location and design of the hairline with the tradeoff being a lower more youthful hairline versus a more conservative hairline that will better conserve the precious limited donor supply and the balance of density and feathering of the hairline.

With regard to the design and position of the hairline in males, as referred to earlier in this article, many male East Indian as well as black patients desire lower more youthful flatter/less laterally receded hairlines, the former because of the desire for better marital prospects in the short term and the latter because of ethnic ideals of beauty (**Fig. 3**). Similarly, certain Hispanic populations

such as Mexican and Columbian to my observation have a certain subset of men with quite low hairlines, thus driving concepts of esthetic ideals. Meanwhile in women the ethnic concepts of beauty in this area have in my observation less fluctuation, with nearly all females desiring rounded hairlines with appropriate forehead height that complements the lower two-thirds of the face (**Figs. 4 and 5**).

With regard to density versus a natural appearance, this is largely an individual choice, with some consistent ethnic rules. The appearance of density is due to several factors: the thickness of each hair, the density of hairs (number of FUs times hairs per FU in a given area), the angulation of the hair (more acute angulation provides the appearance of greater density), the curl of the hairs (more curl means the appearance of more density, compensating for the fact that curlier hairs require typically larger recipient sites and cannot be as densely packed), and finally the contrast between skin and hair color with the lesser the contrast the greater the appearance of density (because the scalp is less visible). This lack of color contrast is also associated with a more natural appearance. Other features associated with a more natural appearance are a more acute angulation of the hair, the appropriate application of single and even 2 hair grafts to create a feathered appearance, and esthetic fluctuation of density. In no



Fig. 2. Patient before (A) and 10 months after (B) reparative procedure using donor hairs from the beard, which has healed up without any scarring (C).

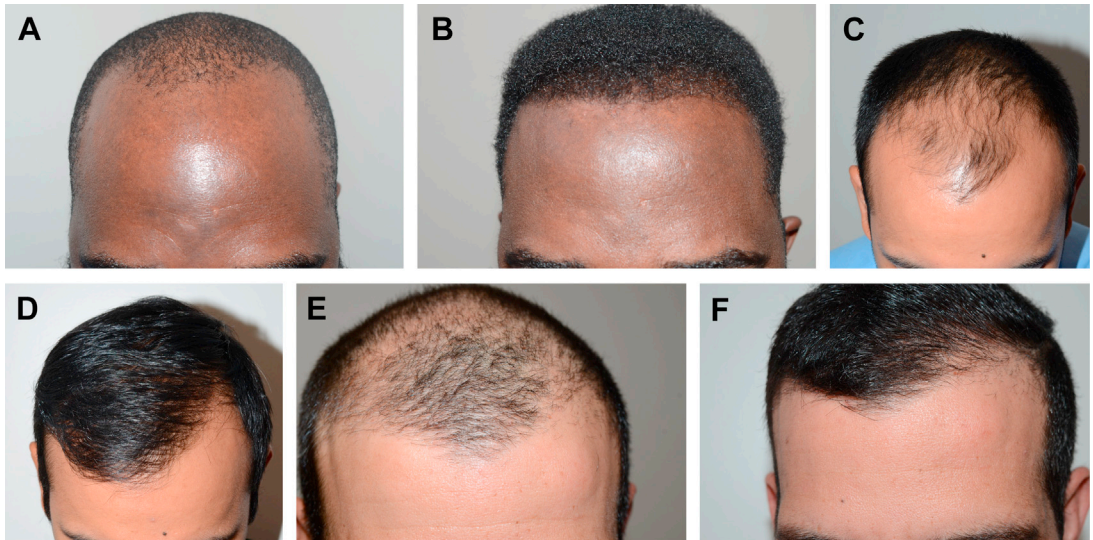


Fig. 3. Black patient before (A) and after (B) hair transplant with a typical desired “flatter” hairline, compared with Hispanic patient presenting with similar hair loss pattern (C, E) and after (D, F) hair transplant.

ethnic group is an emphasis on naturalness over density more important than in Asians, due to the high color contrast between scalp and hair, and the typical straightness and large caliber of hairs (Fig. 6). Meanwhile, the black patient is typically the easiest on whom to achieve density without compromising naturalness, due to the low color contrast and the curly hairs. In fact, the use of single hairs in black patients is usually unnecessary; instead the hairline can be created with all 2-hair

grafts (Fig. 7). Another factor to consider in the black patient is the higher incidence of traction alopecia due to hair styles, as well as particularly in women the higher incidence of scarring alopecias like central centrifugal cicatricial alopecia that can sometimes mimic other types of hair loss, a condition associated with low to minimal hair regrowth.²⁵ Finally, in typically darker-skinned Middle East and East Indian and certain Hispanic men, the lower color contrast between the skin

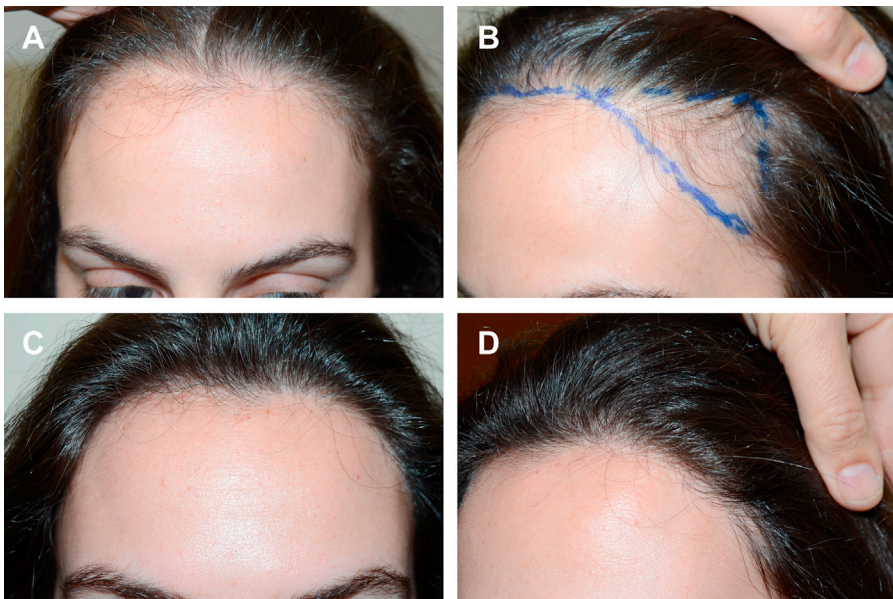


Fig. 4. Before (A, B) and after (C, D) hair transplant on a female to create the near-universal for all ethnic groups’ desired rounded shape.



Fig. 5. Before (A, B) and after (C, D) hairline-lowering/forehead reduction surgery demonstrating the near-universal ideal female hairline shape and position.

and dark brown or black hairs facilitates the achievement of density and naturalness. This phenomenon mimics the same concept but just the opposite situation as seen in many northern Europeans, where the typically lighter hair color blends in well with the similarly typically more fair skin (**Fig. 8**).

Recipient sites with FUE cases in most Caucasians are made with blades sized 0.5 mm for 1- and some 2-hair grafts, 0.6 mm for some 2- and most 3-hair grafts, and sometimes 0.7-mm blades for some larger 3- and larger-sized grafts

especially when there is low compliance of the recipient site skin. Note that in general FUE grafts are around 25% smaller than FUT grafts, reflecting the fact that FUE grafts are often “skinnier” meaning they contain less surrounding supportive tissue than those dissected out under the microscope. These “skinnier” grafts are more prone to desiccation and physical damage during the planting process, a liability that is overcome by the use of graft implanters that facilitate graft placement with minimal to no trauma. Typically recipient sites need to be 0.1 to 0.2 mm larger at each graft size for

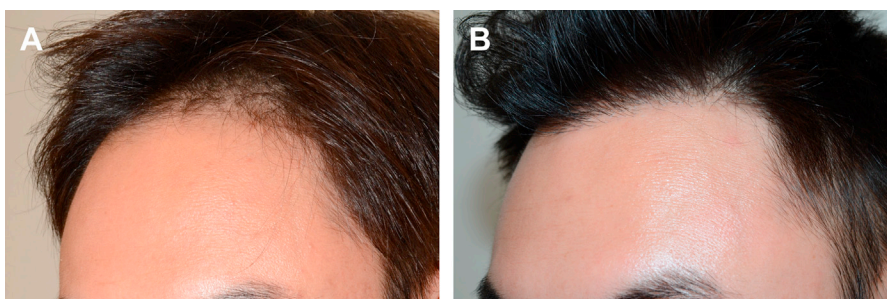


Fig. 6. Before (A) and after (B) FUE hair transplant on Asian male, where mostly 1- and 2-hair grafts were used.

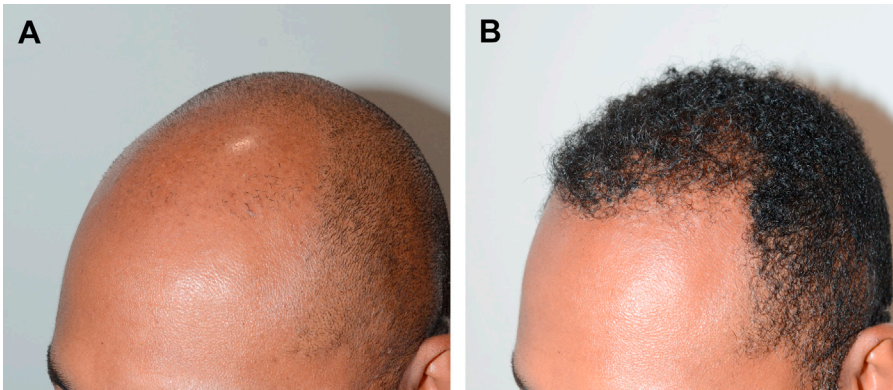


Fig. 7. Before (A) and after (B) FUE hair transplant on black patient, where even along the hairline 2-hair grafts are used to optimize density without compromising naturalness.

patients of Asian and East Indian ethnicity due to the greater thickness of the FU grafts, and 0.2 to 0.3 mm larger for black patients due to the curl of the hairs. Although typically larger in size (0.7–0.9 mm most commonly), the depth of the recipient sites in black patients is usually less than in other ethnic groups due to the hairs being somewhat shorter.

One final observation must be noted in ethnic variation of graft planting. The East Indian patient's grafts are oftentimes more difficult to plant than in other ethnic groups, due to 2 reasons. First, the darker skin (as in black patients) makes it more difficult to actually visualize the recipient sites due to less contrast between the tiny crust of blood and skin color. Second, for reasons that are still unclear to me, the grafts particularly of Pakistani patients have a tendency to be "oily,"

leading to a greater tendency to "pop" after placement as well as an associated greater challenge of placement into recipient sites; however, the use of implanters significantly reduces this challenge.

Eyebrow Transplantation

The requirements for achieving natural results when transplanting eyebrows are esthetic design with symmetry between the 2 sides, flat angulation of the hairs, the ideal balance of 1- and 2- and sometimes even 3-hair grafts, and proper cross-hatching and direction of the hairs. The 2 ethnic groups in whom it is the hardest to achieve natural appearances in eyebrow restoration are Asian and black patients, due to characteristics of the scalp donor hairs (**Fig. 9**). In Asian patients, the typically straight and oftentimes coarse nature of hair



Fig. 8. Three different hair and scalp color combinations of patients who underwent FUE hair transplantation, demonstrating how in a patient with dark skin even when the donor hairs are dark the appearance of density achieved is quite good (A: before, B: after), in a patient with light skin and medium colored hair the appearance of density achieved is somewhat less (C: before, D: after), and in patient with light skin and light reddish hair the appearance of density achieved is quite good (E: before, F: after).

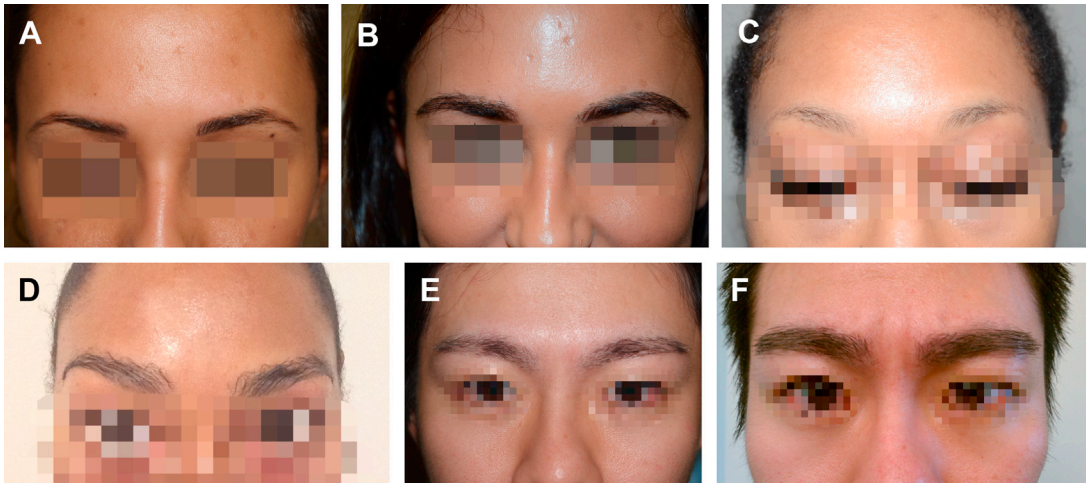


Fig. 9. Three ethnic groups showing result of eyebrow transplantation: Hispanic patient (A: before, B: after), black patient (C: before, D: after), and Asian patient (E: before, F: after).

growth makes it more difficult to achieve flat angulation, because the absence of a curl denies the ability of the hair curling in a direction that complements the angulation of the recipient sites. In black patients who have a “hard” curl to the donor hairs, it can be particularly challenging to achieve uniform direction and angulation of hair growth, resulting in more “rogue” hair growth. To compensate for these challenging hair characteristics when they are present, primarily 1-hair grafts are to be used trading in some of the density in return for greater naturalness. When dissecting the naturally occurring 2- and 3-hair FUE grafts to have more single hair grafts, to ensure viability it is important to leave the single-hair graft with a larger cuff of supporting tissue. These patients are advised that a second procedure can always be performed to increase density if desired. The most impressive results in eyebrow transplantation, due to the characteristics of darker complexion and wavy, reasonably thick donor hairs, are those of Hispanic, East Indian, and Middle Eastern individuals.

Esthetic eyebrow design and size vary among ethnic groups, with certain trends observed. Asian women and men tend to find shorter eyebrows (5–5.5 cm) more ideal, and Middle Eastern men and women prefer thick prominent eyebrows, but these are merely general and not hard rules. One risk we have identified particularly in eyebrows but occurring occasionally in the scalp and the beard is that of black patients developing small bumps at the point where the hair emerges from the skin. Fortunately, this is not frequent, but can occur, and seems to be secondary to some combination of the cuff of skin left on the graft

becoming raised during healing, and the relative thickness and strength of the hair pushing outward on the skin. In the few cases where this has occurred, treatment consisting of steroid injections and or superficial skin shaving seems to ameliorate the presence of these bumps.

In nearly all men and most women, the grafts for eyebrow transplantation are harvested using the FUE technique. Recipient sites most commonly are made using a 0.5-mm blade for 1- and 2-hair grafts. In many cases, the 3-hair grafts, used to achieve central density in select cases, are placed into the same sized recipient sites, but if not a 0.6-mm blade is used to make the recipient sites. The key to esthetic results is optimal placement and angulation of the recipient sites, and meticulous implanting—using implanters—of the grafts into these recipient sites, keeping the grafts moist.

Beard Transplantation

No other component of the face exudes masculinity more than a beard, and the desire for fuller beards continues to grow in nearly all men of all ethnicities, age, and working class. Although a procedure requested by those of nearly all ethnicities, the desired beard appearance can vary widely. For Asian men, in whom beards tend to be naturally less prominent and in some cases limited to just a thin mustache and “soul patch” of hair under the lower lip, almost any type of beard enhancement is acceptable. One of the more common patterns desired in the Asian male consists of a relatively narrow strap beard that runs along and extends upward an inch or so above the jawline, well-defined sideburns, a thin



Fig. 10. Before (A) and after (B) beard transplant on Asian patient, demonstrating the “strap” beard and the outcome when naturalness is best achieved through the use of mostly single-hair grafts.

but present mustache, and narrow but reasonably dense horizontal “soul patch” (Fig. 10). Because of the need for using almost exclusively single hair grafts to assure naturalness (and thus compromising density) due to the thick straight donor hairs, such conservative expectations of density are fortuitous, and of all the ethnic groups the performing of a second procedure for greater density is most common in Asians.

East Indian and Middle Eastern men, along with of course the typical Scandinavian/northern European sic Brooklyn “hipster” seem to desire thick beards to enhance masculinity (Fig. 11). Hispanic men often have particular desire for a strong mustache, whereas some Hassidic Jews not blessed with a thick beard will seek such for social acceptance in the religious community. Black men can have a wide variety of esthetic ideals for the beard, and because of the increased challenge of working with these curly hairs as well as the small but definite risk of bump formation particularly around the goatee that together dictate for the use of mostly single-hair grafts, achieving density can be challenging particularly in those of lighter complexion (Fig. 12).

Like with eyebrow transplantation, acute angulation of recipient sites is required to prevent the hairs from growing at an unaesthetic direction; this is best achieved through the use of the smallest possible recipient sites, most commonly

0.5 mm for single- and sometime 2-hair grafts, where 0.6 mm is sometimes required. It is also important that patients, particularly younger men younger than 30 years, be evaluated for the presence or risk of male pattern baldness, because any hairs transplanted into the beard are hairs not available in the future for transplanting into areas of male pattern hair loss. One way to at least partially deal with this limited supply of donor hairs is to use the beard as donor. Although it can be somewhat more challenging to extract, with experience and the use of certain hybrid FUE punches, beard donor hair has a high and consistent rate of regrowth, and essentially overnight healing without any scarring. When attempting beard hair donation in the black patient (or for that matter, transplantation into the beard), it may be valuable to do a test procedure of less than 100 grafts to assess healing of the donor and recipient areas. A history of folliculitis barbi in the black patient poses a risk of poor healing in both the donor and recipient areas. Hyperpigmentation, although intuitively would seem to be a risk when transplanting patients of ethnic groups of darker or Asian skin, does not seem to be a problem.

The great majority of beard transplants are performed to address genetic thinness, but in certain cases there can be other causes. Prior laser removal, later regretted, can be reversed successfully. The beards of gender reaffirmation—female

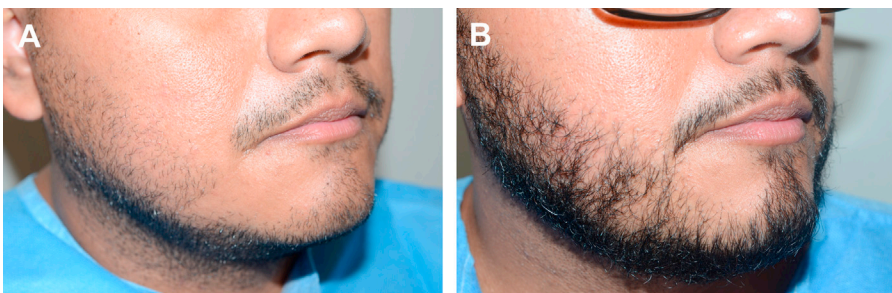


Fig. 11. Before (A) and after (B) beard transplant in patient of Middle Eastern ethnicity.

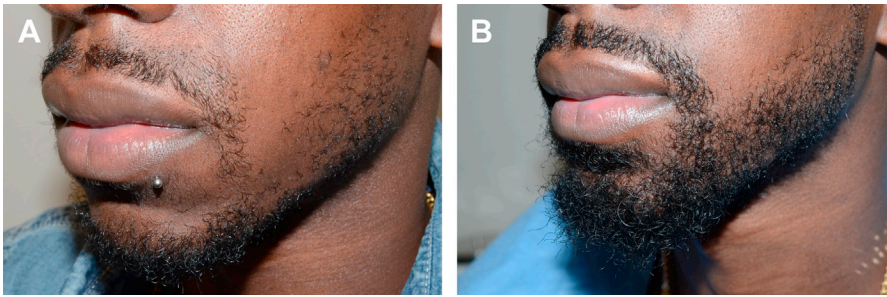


Fig. 12. Before (A) and after (B) beard transplant in black patient.

to male—patients are limited in the amount of hair growth that can be expected with testosterone administration, and with the restoration of a strong goatee and sideburns, to even a full beard; there can be a nice improvement in a masculine appearance. Other causes for beard transplantation include trauma and previous surgery, and although scars can be more difficult in which to achieve full regrowth, in most cases there can be a nice esthetic result.

Hairline-Lowering/Forehead Reduction Surgery

Over the past 5 years, the popularity of this surgical procedure to lower the overly high hairline has grown tremendously, due to the recognition of the advantages in the appropriate patient. As an alternative to hair grafting, HLS is capable of

shortening the overly high usually female hairline by an inch or more in a single procedure, yielding instantaneous results and unsurpassed density (equivalent to the transplanting of 4000 to as many as 7000 grafts).^{1,9,26}

The surgery is performed under general anesthesia, and takes less than 2 hours to perform. After the making of a trichophytic incision along the marked out hairline to assure hair growth through the scar, the scalp is undermined in the subgaleal plane 3 to 6 cm beyond the vertex so that it extends close to or up to the nuchal ridge, maximizing scalp mobility. Mechanical creep (traction) is applied, occasionally a coronal galeotomy made for increased advancement (not usually performed due to the increased risk of shock hair loss), and the now advanced scalp is secured in position (typically 20–25 mm further forward) by paired Endotine clips, whose barbs engage into

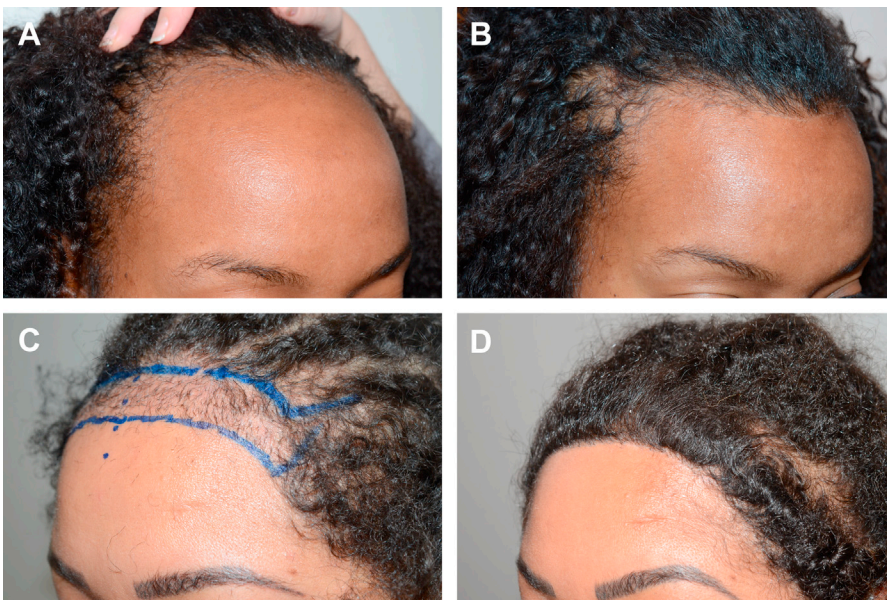


Fig. 13. Before (A) and after (B) hairline-lowering/forehead reduction surgery in black patient, and before (C) and after (D) images in another black patient who underwent hairline-lowering/forehead reduction surgery to excise prior transplants and create a fuller more esthetic hairline.

the galea. The excess forehead skin is excised, and the skin closed in a layered fashion, under minimal to no tension due to the engagement of the Endotine clips. Patients are presentable 1 or 2 days after with brushing of the frontal hairs forward to conceal the sutures until they are removed 1 week later. In around 15% to 20% of patients, hair grafting is performed as soon as 3 months later, to conceal any visibility of the hairline scar that can occasionally occur, or to round out the hairline further than that which can be achieved by the surgery.

To be a good candidate for HLS, there must be sufficient laxity of the scalp, and no evidence of thinning of the hairline hairs, otherwise with loss of these hairs the typically fine-line scar with hair growing through it could become exposed with time. Because of this requirement for permanent hairs, few men are safely or appropriately treated with HLS, particularly those aged 45 years and younger. Prior browlift or facelift surgery is usually a contraindication to HLS due to impairment of blood circulation.

The most common ethnic group to undergo HLS are black patients (Fig. 13). First, there is a tendency of high foreheads particularly in those of East African (Eritrea, Kenya, Ethiopia, and Sudan) ethnicity, who due to more Western ideals of beauty tend to want to reduce the forehead prominence that is achieved with this surgery. Second, many black patients tend to have good scalp laxity, thus allowing for a greater amount of lowering than seen in other ethnic groups.²⁷ The concern for keloid or hypertrophic scarring does not seem to be justified in black patients, in whom the great majority have excellent hairline scars with hair growth through it. The desire to correct what is usually a genetically high hairline, which conveys senescence and sometimes masculinity, is not limited to any one ethnic group. Hispanic as well as Middle Eastern and Asian women all frequently choose HLS due to the many advantages over grafting including the impressive, virtually overnight results.

SUMMARY

Hair restoration surgery, whether to the scalp to treat pattern hair loss or high hairlines or a variety of other causes, or to the eyebrows to treat overplucking or thinning due to senescence or disease, or to the beard due to genetics or the undesirable outcome of prior laser hair removal, can all be effective and popular options in those of all ethnic groups. Consideration of differences in hair characteristics, healing, and esthetic ideals must all be factored into the decision-making process.

DISCLOSURE

The authors have nothing to disclose.

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