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The Use of Body Hair with Scalp Hair for "Combination Grafting" to Enhance Visual Density of Hair Transplantation and Increase Coverage in Advanced Alopecia

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ABSTRACT

Introduction: Hair transplantation is becoming the most common cosmetic procedure for men across the world with demand for higher density and treatment of extensive hair loss. This requires a higher number of donor follicles. Beard and body follicles can be used in addition to scalp hair as donor in suitable patients.

Objective: To demonstrate the use of body hair to increase the visual density and for better coverage for higher grades of androgenetic alopecia (AA).

Method & Material: Sixteen patients were selected due to the availability of body donor hair and consent for body hair harvesting was taken. The beard was the first preference and then chest and abdominal follicles were used in combination with scalp hair follicles to treat Norwood grade IV and above. Beard and body hair were harvested using the follicular unit excision (FUE) technique. Post-operative pictures were taken and patient satisfaction, doctor's observation, and global photographic evaluation was done.

Results: Following hair transplantation, patient photographs were taken at 4, 8, and 12 months. The results were assessed on the basis of global photography. The use of body hair combined with scalp hair greatly enhanced the visual density, leading to better coverage in even higher grades of hair loss.

Conclusion: "Combination grafting" is a good method to use to treat higher grades of hair loss as well as to enhance the results of hair transplantation in suitable patients.

Key words: combination grafting, FUE, Norwood grade

INTRODUCTION

Hair transplantation is becoming a very popular procedure. The demand for higher density coverage with a normal appearance is increasing. This requires a higher number of donor hair follicles. The biggest limitation of the hair transplant procedure is the discrepancy between demand and supply. Beard and body hair are a good source of donor hair follicles.[1,2] We use "combination grafting" in which scalp hair follicles are transplanted with body hair follicles. Combination grafting is a similar procedure to mixed grafting in which multifollicular units (MFUs) are mixed with follicular units (FUs). This not only increases the total number of donor hair follicles but it also enhances results because of the higher diameter and visual density of beard hair. Although body hair other than the beard is thinner, it certainly adds to the coverage value and is better than scalp micropigmentation.

Beard hair typically is thicker and curlier, giving higher visual density, and is used in the forelock and mid-scalp area. Beard, chest, and other body areas are non-scalp sources of donor hair follicles and their growth is androgen-dependent, which is an advantage in androgenetic alopecia.

OBJECTIVE

We used a combination of body hair follicles and scalp hair follicles to enhance the visual density of hair transplantation and provide better coverage for higher grades of scalp hair loss.

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METHOD

Scalp hair follicles were mixed with body hair and transplanted to cover the area of hair loss. In all 16 cases, combination grafting was performed. To assess the suitability of patients, all cases of male pattern alopecia of Norwood grade IV and above were examined and evaluated for donor availability of scalp and body hair. In India, many patients have very good beard hair. A detailed discussion was conducted with the patient and consent was taken for using the combination approach. In all cases, a scalp donor hair trichoscan pre-examination at five locations was performed. Scalp hair was harvested either by FUT or FUE, with the selection of the harvesting method made by choice of the patient after discussing each method's pros and cons. Body donor hair follicles were harvested using the FUE technique. Two surgeons harvested and planted simultaneously to reduce the surgical time. The total follow-up period was 18 months.

In **Norwood grade IV**, we planned 2,500-3,000 grafts. With consent, we harvested 20-30% of the total grafts/follicles from the beard (approximately 600-900).

In the first 2cm of the defined hairline zone, including the transition zone, only scalp hair follicles were used and placed as per the standard guidelines described by Shapiro and others.[5] Then in the three rows behind the defined zone, we mixed scalp with beard hair in the ratio of 2:1 for a more natural look, while in the forelock area, we mixed scalp with beard 1:1 for more fullness. Similarly, in the mid-scalp area, we placed the remaining beard hair mixed with scalp hair follicles roughly in the ratio of 3:1. We did not cover the crown in younger patients, we advised them to initiate medical therapy. Figure 1A depicts scalp hair placement and Figure 1B depicts beard hair placement showing the planning of combination grafting. Figure 1C shows the actual plan drawn and executed on the patient's scalp.

In **Norwood grade V** baldness, 4,000-5,000 grafts were planned. In a single harvesting, either by FUT or FUE, we harvested 2,000-3,000 grafts from the scalp donor area and the remaining from the beard and/or chest. Planning of placement with mixing of the scalp to body ratio remained the same as explained in grade IV, only that the remaining body hair was placed in the mid-scalp area. The above procedure was done over two consecutive days. All scalp hair follicles were inserted on day 1 leaving space for beard/other body hair follicles for the next day. On the second day, body hair follicles were harvested and inserted in the gaps left between the scalp hair follicles. (See Figure 2.)

FIGURE 1. *A:* After hair follicle insertion in Norwood grade IV, *B:* after beard hair follicle insertion, *C:* planning of combination transplantation (scalp + beard)

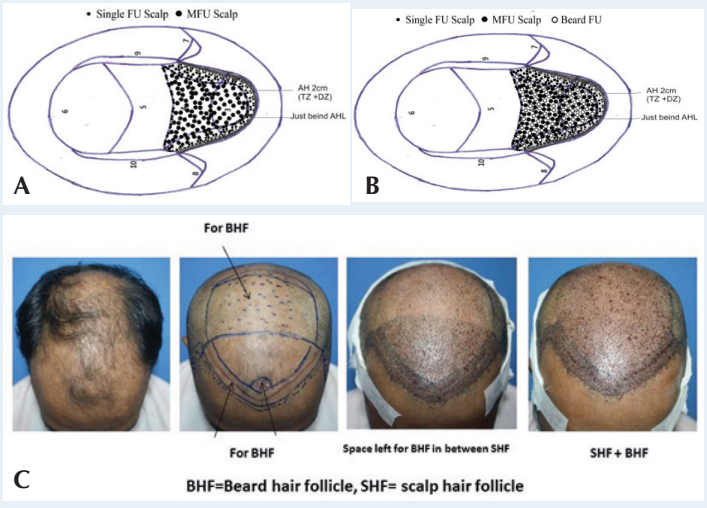


FIGURE 2. Planning of scalp and beard hair follicles in Norwood grade V

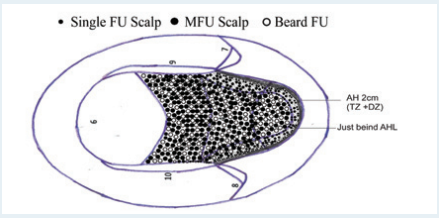


FIGURE 3. Grade VI planning

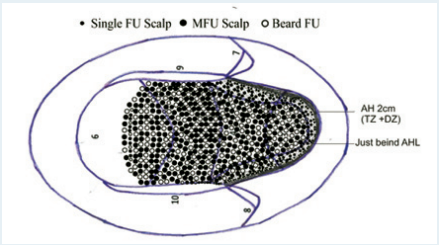
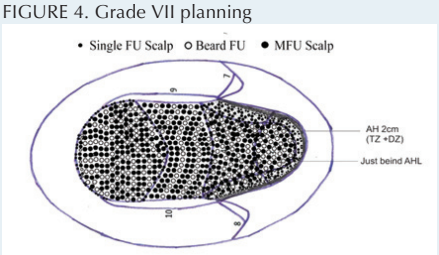


FIGURE 4. Grade VII planning



In **grades VI and VII**, a detailed master plan of recipient and donor areas was done after discussion with the patient. The total amount of FUs to be transplanted were calculated and the number of follicles harvested from each area in multiple stages was planned as explained below (Figures 3 and 4):

- Routinely, we transplant 6,000-7,000 grafts for grade VI loss depending on donor availability and the number of grafts the patient desires. Out of this total, we harvest 4,500-5,000 from the scalp in multiple stages and the remaining from the beard and other body parts.
- In the first session, two consecutive days are planned. A total of 5,000 grafts are harvested to transplant from the hairline to the vertex transition point. Out of these grafts, 2,500-3,000 are harvested from the scalp and the remaining from the beard or other body parts. The planning of graft distribution in the front area remains the same as described in grades IV and V, and the remaining area of the scalp is done mixing scalp hair with beard hair.
- If a patient wants further sessions, a minimum 4-month delay is recommended. It may be a 1- or 2-day harvesting session. On any given day, we do not harvest from more than two body areas and all precautions are taken that the dose of anaesthetic agent remains within safe limits.

In **grade VII**, we transplant 7,000-8,000 grafts in multiple sessions. Planning remains the same as in Norwood grade VI.

RESULTS

See Figures 5-9 on the next page, which show overall results for each case.

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FIGURE 5. Case I, Grade IV

Total grafts - 3,017, Scalp - 2,493, Beard - 524, Single day

FIGURE 6. Case II, DPHL/Diffuse Pattern Hair Loss

Total grafts - 5,119, Scalp - 3,112, Beard - 2,007, Two days

FIGURE 7. Case III, Grade VI

Total grafts - 4,900, Scalp - 2,996, Beard - 1,904, Two days

FIGURE 8. Case IV, Grade VII

Total grafts - 8,017, Scalp - 4,007, Beard - 3,010, Chest - 1,000, Days 2 + 2

FIGURE 9. Case V

Total grafts - 5,200, Scalp - 3,207, Beard - 1,993, Two days

Discussion

The total scalp hair-bearing area is approximately 520cm^2 (Bernstein and Rassman[6,8]), and from this, around 200cm^2 is usually the safe donor area (Cole[7-9]), the remaining area is approximately 300cm^2, which is androgen dependent and vulnerable to alopecia. To give the visual effect of reasonable density, we ideally need to transplant 30-40 grafts per square centimeter in this 300cm^2 area. For this, we need around 9,000 grafts. As per standard calculation, the total graft number in the safe scalp donor area is 12,500, and out of this, we can safely harvest 6,000 grafts. So there is a deficit of approximately 3,000 grafts to cover hair loss in the grade VII patient. This deficit can only be covered by using additional non-scalp hair follicles (i.e., body hair follicles). By presuming that any patient presenting at grade IV or above has the chance to progress to grade VII, we might need up to 9,000 grafts in total to cover the hair loss in the future. But certainly this calculation demands the search for non-scalp donor area. Body hair of around 3,000 FUs and above can be harvested from the beard, chest, and extremities as per the requirement and availability. Even in patients who wish to keep a beard, we design what shape of beard they would like to have and then harvest from the remaining area. We have not used donor hair from the extremities.

Alternatively, there are steps to make up the deficit, such as planning a higher anterior hairline, avoiding transplanting in the crown and temporal triangle, or using gradient density and scalp micropigmentation.

The term "mixed grafting"[3,4] was used for a hair transplant procedure in which FUs along with multi-follicular unit grafts (MUGs) were implanted to increase density and reduce implantation and overall surgical timing. The main advantage was better density, but when not done properly there could be cosmetic compromise as proper planning of placement of MUGs with FUs is very important. This used to be a problem in the era of MUGs, but then micro-grafting was developed that improved the cosmetic appearance, so MUGs almost disappeared. Still, the need for higher density could not be overlooked. Recombinant grafting[15] and high-density grafting[10,11] have their own advantages and disadvantages: high-density grafting adversely affects graft survival and recombinant grafting needs a greater number of donor hair follicles.

The advantage of body hair follicles is that they are non-scalp donor hair follicles. Beard hair is thicker, giving a better illusion of density. Hair from other body areas certainly increases the density and is better than scalp micropigmentation.

We plan for body hair transplantation even at the first hair transplant procedure so a proper scalp and body hair "combination grafting" is planned and scalp hair is preserved

for future use. In Norwood grade IV cases, as narrated, we transplant a total of 2,500-3,000 grafts, and out of this, we harvest 2,000 follicles from the scalp and the remaining from the beard and place them just behind the hairline, forelock, and mid-scalp. We have seen very encouraging results in terms of visual density.

Similarly, the use of chest hair is good for the mid-scalp and crown along with the beard and scalp hair. Chest hair is thinner compared to beard and scalp hair, but because of the curl of chest hair, the resulting visual density is reasonable and certainly better than doing scalp micropigmentation. Another area yielding good quality of hair is the pubic area, for which patients often opt if harvesting is done by FUE.

Studies by Kim,[12,13] Hwang,[12,13] and Lee[14] show that when body hair is transplanted to the scalp, the thickness remains unchanged, but they become longer and the growth rate also increases. We have been harvesting body hair for more than three years using Cole Instruments 0.75 and 0.80mm sharp serrounded punches for beard, chest, and abdomen hair, but we have no experience with hair from the extremities. In the last two cases where chest and abdomen hair were very curly and long, we used a 0.9mm flared punch and this reduced transection. We evaluated beard and chest donor hair for density and thickness.

Patient satisfaction with body hair is very high. In our series, in almost all cases, body hair after transplantation did not go into anagen effluvium (no comparative study done). The transplants were frizzy and dry initially but improved over two years. In our experience, chest hair growth appeared to be slower (no comparative study, just an observation).

CONCLUSION

"Combination grafting" is a good method for treating extensive hair loss as well as enhancing the results of hair transplantation in suitable patients.

With experience, the physician can overcome technical challenges of body hair harvesting such as anesthesia, harvesting speed, and transection, and can perform body hair harvesting as a good adjunct to hair transplantation.

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