

Original Article

Beard Reconstruction

Ummer Yaseen, Shabir Ahmed¹, Muzaffar Ahmed²

Assistant Professor, ¹Associate Professor, ²Senior Resident, Department of Dermatology, Government Medical College, Anantnag, Jammu and Kashmir, India

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ABSTRACT

Introduction: Loss of beard can occur due to many reasons. As beard has huge cosmetic importance, loss of beard can be psychologically traumatic. Beard can be absent from puberty, called as congenital absence of beard. Beard loss can be secondary to dermatological conditions such as nodulocystic acne. In our setting, the most common cause of loss of beard is burn injury. There are many treatment options such as surgical excision of scar, flaps Z/W plasty, and hair transplantation to reconstruct the beard. We present the follicular unit extraction (FUE) method of beard reconstruction. **Aim:** The aim of our study was to describe the evaluation of the results using FUE method for beard reconstruction. **Materials and Methods:** We did a study in twenty male patients. Any patient having alopecia areata were ruled out of the study. Fifteen patients had postburn loss, three had postacne scarring, and two patients had congenital absence of beard. We evaluated all patients thoroughly by calculating the density of beard over the normal areas of beard, evaluating the elasticity of skin, preoperative photography, and doing dermatoscopy. Areas were marked. FUE was used for harvesting the grafts as a limited number of grafts were needed to complete the surgery. In the recipient area, adrenaline was avoided in patients of scarring alopecia. In cases of congenital absence of hair, 1:200,000 adrenaline was used to minimize bleeding. Grafts were placed. Results were noted after 1 year. **Results:** All patients followed up properly for 1 year. Growth started 3 months postoperatively and continued till 1 year postoperatively. Density was good in cases with congenital absence of hair. In cases of scarring alopecia, multiple sessions were needed to provide adequate density. Results were graded as “very good,” “good,” and “poor.” Eleven patients had “very good” result, eight had “good,” and one had “poor” result. Nineteen patients were satisfied with the final result, and one patient was dissatisfied with the result. **Conclusion:** FUE is the ideal method of reconstructing beard loss. Proper preoperative evaluation, preparation, planning, and proper surgical technique produce the best possible result.

Key words: Beard alopecia, beard transplantation, follicular unit extraction

Address for correspondence:

Dr. Ummer Yaseen,
Department of Dermatology,
STD and Leprosy,
Bengaluru, Karnataka, India.
E-mail: umar.ysn5@gmail.com

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INTRODUCTION

Hair transplantation is based on the concept of harvesting follicular units from the androgen-resistant areas and placing them over those areas where hair loss has occurred.^[1,2] There are many indications of hair transplantation, and loss of beard is one such indication. Beard hair grows dramatically during puberty and continues in density until the mid-thirties. Beard hair tends to be coarser than that of scalp hair.^[3] Anagen and telogen phase of beard hair is 4 weeks and 10 weeks, respectively. Androgens exhibit a paradoxical effect on beard hair in that it promotes the hair growth as compared to the scalp hair, where it reduces the growth. Loss of beard can occur due to multiple reasons. It can be primarily known as congenital hypotrichia/atrichia. Secondly, loss of beard can occur due to trauma, traction, postfolliculitis, postacne, and

burns. As beard has cosmetic significance, loss of beard can be associated with a lot of psychosocial ailments.^[4] Burn scars have been previously treated using excision, tissue expansion, and flap surgery, but these procedures have greater downtime and do not produce natural-looking result, though can be useful in large burn scars, greater than 8–10 cm in maximum diameter.^[5,6] We reconstructed beard in patients having congenital hypotrichia, burns, and

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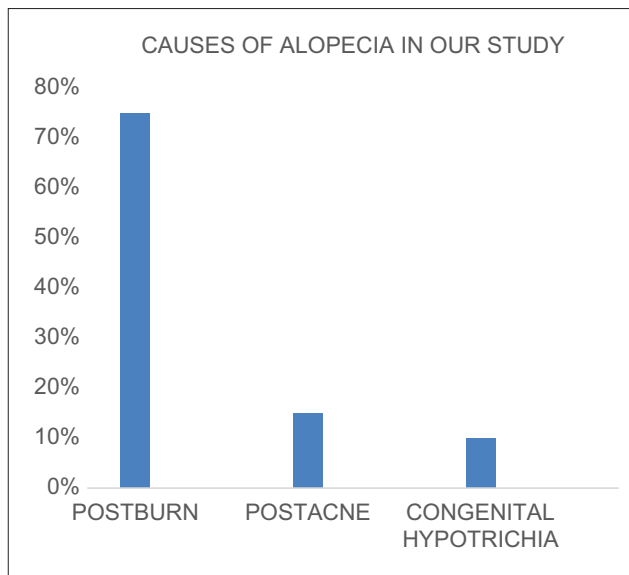
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postacne scarring. As the hair over the occipital and parietal scalp is androgen insensitive, most of the times, these areas are selected as donor areas. These follicles retain the characteristics of donor area known as donor dominance. They can thus be used to reconstruct the beard. In our setup, we frequently encounter patients who have postburn alopecia. In this study, we have evaluated the results of the scalp to beard hair transplantation.

MATERIALS AND METHODS

Twenty patients having beard loss in the age group of 25–35 years were enrolled in our study after taking proper informed consent. Our institutional ethical committee approved this study. Fifteen patients (75%) were postburn cicatricial alopecia [Figures 1 and 2], three (15%) had postacne scar alopecia, and two (10%) had congenital absence of beard [Figure 3 and Graph 1].

In all cicatricial alopecia, a test transplant was done to check for the growth. All patients were explained the procedure and were warned that final results may need multiple sessions, though our goal was to achieve full density in one session. On the day of surgery, the area to be operated upon was measured by dividing it into virtual triangles/rectangles, and the area to be operated upon was marked in a feathered manner so as to make the results look more natural [Figure 3]. We planned a density of 20 follicular units/cm² and thereby calculated the total number of follicles required for that particular area. Grafts were harvested by follicular unit extraction (FUE).



Graph 1: Causes of alopecia

Anesthesia

We used field block with Xylocaine 2% and 1:100,000 adrenaline to reduce bleeding over the donor area. Over the recipient areas, adrenaline was avoided in postburn and postacne scar alopecia, as vascularity is already compromised in scar area, whereas in congenital hypotrichia [Figure 4], Xylocaine 2% with 1:200,000 adrenaline was used.

Graft harvesting

After calculating the number of grafts required for each area, the harvesting was done using FUE method. 0.9 mm (internal diameter) blunt, cylindrical, nonserrated punch was used to harvest the grafts. We preferably harvested from occipital scalp as hair over this area is coarse and matches the beard hair to a large extent.

Graft preparation

We used normal saline as the storage media as it is cheap and readily available. We separated 1, 2, and 3 hair grafts to be placed in the desired areas.

Recipient site incisions

We used a stick-and-place method of graft placement by holding grafts over top of the follicle. The choice of follicle at a particular place depends on the recipient site. If the area happens to be near the superior beard line, only single hair units are used; over the cheeks, 2 or 3 hair grafts can be used. Over the chin [Figure 5], single and double follicular units can be combined. Over the submandibular areas, 2 and 3 hair grafts were used. We used 18G, 19G, and 20G needle for 3, 2, and 1 hair grafts, respectively. Saline tumescence was used to stabilize the loose skin.

Postoperative care

Patients were asked to take strict postoperative precautions so as to avoid any dislodging of the grafts. Patients were asked to flush the recipient area periodically with normal saline so as to avoid any excess crust formation and hence minimize the chances of infection. Oral antibiotic and anti-inflammatory agents were used for 3–5 days postoperatively. The donor area was covered with dressing and removed on day 3.

Follow-up

Patients were advised to come for follow-up after 1 month, 5 months, and 1 year postoperatively.



Figure 1: Postburn cicatricial alopecia



Figure 2: Postburn alopecia in submandibular area



Figure 3: Marking of the area with irregular outline



Figure 4: Congenital hypotrichia of beard



Figure 5: Single and two hair grafts were placed over chin



Figure 6: After transplant in patient shown in Figure 1



Figure 7: Submandibular area [as shown in Figure 2] after transplant

RESULTS

All patients followed up properly for 1 year. Patients were in the age group of 25–35 years [Table 1].

Growth started 3 months postoperatively and continued till 9 months postoperatively. Density was good in cases with congenital absence of hair. In cases of scarring alopecia, multiple sessions were needed to provide adequate density. Results were graded as “very good,” “good,” and “poor.” Eleven patients had “very good” result [Figures 6 and 7], seven had “good,” and two had “poor” result. The results of our study group are shown in Table 2.

Eleven patients were highly satisfied, eight patients were satisfied, and one patient was dissatisfied with the final result [Table 3].

Apart from mild postoperative pain and ecchymosis, there were negligible side effects. Two patients had ecchymosis which subsided after 4–5 days.

DISCUSSION

There are very limited studies in the literature which have

documented the results of FUE^[7] in congenital absence of beard and postburn scars; previously, excision of scar or tissue expansion techniques^[8] were used to treat the postburn scar. Moreover, before the advent of hair transplantation, there was no treatment for congenital absence of beard. In burn scars, tissue expansion techniques have been used but have greater downtime, and results are not as good as transplantation. Beard transplantation is different from scalp hair transplantation in many ways. Tolgyesi *et al.*^[9] provided fundamental information about the significant differences between scalp and beard hair. Their study elaborated that beard hair is 70%–100% greater in cross section as compared to scalp hair. It is also more bristle and elliptical than scalp hair in all races. Density of the hair is less compared to the scalp. Kulachi *et al.*^[10] reported, in her study, a density of 25–30 FU/cm².

The FUE technique avoids linear scar and suturing over the donor area. With FUE, grafts can be harvested from a wide area, all over the scalp. FUE does not require a team of assistants to sliver and dissect the grafts. With FUE we can select one, two or three hair grafts as per the requirement. However, FUE requires training and development of skills. We use blunt technology to harvest the grafts with a punch size of 0.9 mm. With the use of blunt technology, there is less transection

Table 1: Age of study group

Age (years)	Number of patients (%)
20-25	6 (30)
26-30	9 (45)
31-35	5 (25)

Table 2: Results of our study group

Age (years)	Diagnosis	Area of beard transplanted	Number of follicular units transplanted	Result after 1 year (physician assessment)	Satisfactory level (patient assessment)
21	Postburn alopecia	Submandibular area	350	Very good	Highly satisfied
25	Postburn alopecia	Cheek	250	Very good	Highly satisfied
26	Postburn alopecia	Sideburns, submandibular area, and submental area	1000	Good	Satisfied
28	Postburn alopecia	Mandibular area	250	Very good	Highly satisfied
31	Postburn alopecia	Chin	250	Very good	Highly satisfied
29	Postburn alopecia	Submandibular area	350	Very good	Highly satisfied
23	Postburn alopecia	Cheek	450	Good	Satisfied
32	Postburn alopecia	Sideburn	350	Good	Satisfied
32	Postacne scar alopecia	Mandibular area	150	Very good	Highly satisfied
35	Postburn alopecia	Cheek	450	Good	Satisfied
21	Congenital hypotrichia	Chin	330	Very good	Highly satisfied
20	Congenital hypotrichia	Mandibular area	250	Very good	Highly satisfied
26	Postburn alopecia	Angle of mandible	450	Good	Satisfied
28	Postacne scar alopecia	Cheek	150	Very good	Highly satisfied
29	Postburn alopecia	Submandibular area	350	Poor	Dissatisfied
27	Postacne scar alopecia	Cheek	250	Very good	Highly satisfied
32	Postburn alopecia	Mandibular area	450	Very good	Highly satisfied
25	Postburn alopecia	Cheek	250	Good	Satisfied
21	Postburn alopecia	Submandibular area	250	Poor	Satisfied
29	Postburn alopecia	Cheek	350	Good	Satisfied

Table 3: Satisfactory score of the study group

Satisfactory score	Number of patients (%)
7-10 (highly satisfied)	11 (55)
4-6 (satisfied)	8 (40)
0-3 (dissatisfied)	1 (5)

of grafts. Placing the grafts is relatively easy in patients having congenital absence of beard as the skin over those areas is normal. In cases of postburn and postacne scar alopecia, the skin is firm and hypertrophic and that makes graft placing a difficult task.

For the purpose of beard reconstruction, the face is divided into lateral and frontal aspects. The lateral aspect is formed by sideburns, cheeks, jawline, and submandibular areas. The frontal aspect is comprised mustache and the chin area. The submandibular area is also included in the beard. The design of the beard has to be individualized according to the patient's desires. The desired density varies with the cause of alopecia. In cases of cicatricial alopecia as the vascularity is compromised, we cannot expect a very good density. However, in cases of congenital hypotrichia, a good density can be achieved. The density varies from one region of the beard to another being highest at the chin and mustache and less in other regions. This has to be taken into account at the time of planning of surgery in each patient. On an average, 250 grafts for each sideburn, 350–600 grafts for each cheek, and 550–650 graft for the mustache and chin area are to be used. In cases of cicatricial alopecia, these grafts can be placed in more than a single session.^[11-13]

The position of the patient has to be supine while doing the graft placement. We used stick-and-place method of graft placement while placing the grafts. We used a different needle size for 1, 2, or 3 hair grafts. To make the transplant look natural, the angle and direction have to be in accordance with any preexisting hair in the region, and if not so, the angles have to be in accordance with those over the opposite side of the face. Recipient sites have to be made 5–6 mm deep or matched with the length of hair follicle to avoid bumpy and pitted scars.

Postoperatively, antibiotic dressing is to be kept over the donor area. Recipient area is left open and patients were asked to flush normal saline over the recipient area to keep

the area moist. After 1–2 weeks, the transplanted hair starts to fall off. Hair growth is expected to start by the end of the 3rd–4th month postoperatively and completes by the end of 1 year.

CONCLUSION

Beard transplantation can be rewarding both for the patient and the surgeon if done properly. The patient must be explained all the pros and cons of the surgery, and results should exceed the expectations.

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Conflicts of interest

There are no conflicts of interest.

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