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Case Report

Treasure out of trash: Repurposing unwanted beard hair for eyebrow restoration in ectodermal dysplasia using follicular unit extraction

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ABSTRACT

Ectodermal dysplasia is a congenital disorder often causing sparse or absent eyebrows, leading to aesthetic and psychological distress. Eyebrow transplantation using follicular unit extraction (FUE) is a viable solution, but donor site selection is crucial. This case explores the use of high beard hair from the maxillary region for eyebrow reconstruction, offering dual benefits. A 26-year-old male with ectodermal dysplasia presented with sparse eyebrows, complete scalp hair loss, and a high beard line with papular eruptions. He suffered from depression, anxiety, and social withdrawal. Eyebrow reconstruction was performed using FUE technique, 150 single follicular units per eyebrow were transplanted. The procedure not only restored the eyebrows but also removed unwanted beard hair and resolved papular eruptions, enhancing facial aesthetics. At three months, most transplanted hairs had regrown, and the donor site healed well without requiring additional laser hair removal. Over two years, the patient maintained good eyebrow density and reported significant improvement in confidence, self-esteem, and social interactions. Using high beard hair for eyebrow transplantation in ectodermal dysplasia provided a successful aesthetic and psychological outcome. The dual benefit of repurposing unwanted beard hair for eyebrow restoration makes this approach a valuable option for similar cases.

Keywords: Beard hair, Ectodermal dysplasia, Eyebrow restoration, Hair transplantation

INTRODUCTION

Ectodermal dysplasia (ED) is a rare genetic disorder affecting the development of ectodermal derivatives such as sweat glands, hair, and teeth.[1]

Hair impairments in ED vary widely, ranging from partial to complete absence of hair on the scalp, eyebrows, eyelashes, pubic, and axillary regions, with eyebrow hair loss occurring in 72% of cases.[1,2]

This loss is particularly distressing, as it significantly impacts facial esthetics and can lead to emotional and psychological challenges.

Conventional management strategies for sparse hair in ED include topical agents such as minoxidil with tretinoin, wigs, and topical hair formulae.[3,4]

In recent years, surgical interventions like hair transplantation have emerged as promising options for treating hair loss in ED patients. However, their application remains limited due to the lack of donor area in patients with ED. Eyebrow reconstruction can be achieved using

techniques such as hair-bearing flaps, free composite strips, or hair transplantation, with the follicular unit extraction (FUE) technique now considered the gold standard for surgical hair restoration.[5,6]

This case report highlights the challenges and innovative approach of eyebrow reconstruction in a patient with ED, using FUE with a high beard line as the donor site. This method not only restored esthetic appearance of the eyebrow but also addressed the patient's concern regarding a higher beard line, offering dual benefits.

CASE REPORT

A 26-year-old male patient presented with a clinical diagnosis of ED for esthetic treatment of the face. He had sparse eyebrows since childhood and a higher beard line extending onto the malar area with papular eruption [Figures 1 and 2]. On examination, scalp hair was absent, and the patient was wearing prosthesis (wig); eyebrows were sparse, he had hypodontia, with the absence of central incisors, and all teeth were cone-shaped, and his intelligence quotient was in the normal range. The patient was severely depressed and anxious about the appearance and had social withdrawal. He was planned for eyebrow reconstruction with unwanted beard hair on the maxillary area as a donor. Under aseptic precautions, under field block and tumescent anesthesia, the follicular units were extracted from the zone above the marked line on the maxillary area by FUE technique using 0.8-mm sharp punch. All were single follicular units; they just popped with 1 mm to 1.2 mm of scoring. Grafts were extracted with ease by single forceps and stored in ringer lactate solution. The recipient site (B/L eyebrows) was marked keeping the high arched nature of the forehead and was approved by the patient. The eyebrow was anesthetized by injecting 2% lignocaine with adrenaline. The grafts were implanted using 21-gauge needle by the stick and place method, aligning more parallel to the skin, following the direction of the normal thin vellus hair. A total of 150 follicular unit hairs were transplanted in each eyebrow [Figure 3]. The donor area healed excellently with the advantage of not only the complete hair removal from the maxillary area but also the papules disappeared as it was also extracted along with the graft. This improved the appearance of the patient by lowering the beard hair. The patient was followed up on day 3, day 15, and 3 months. In 6-month follow-up, most of the hairs had regrown, and the patient was satisfied and confident [Figure 4].

Figure 1: Note the higher beard line and sparse eyebrows.

The patient was advised to trim the transplanted hairs regularly as they grew. He was followed-up till 2 years the density of hair was maintained well. The patient expressed significant satisfaction with the esthetic outcome and reported an improvement in self-esteem and quality of life.

DISCUSSION

Eyebrow transplantation is a well-established technique for restoring lost eyebrow hair; however, selecting an appropriate donor site is crucial for optimal results.[7] In ED patients, scalp hair is often sparse or absent, necessitating the use of alternative donor areas. In this case, FUE technique was used to harvest hair from the upper beard line. FUE is a minimally invasive technique that allows for the precise extraction of individual follicular units, reducing donor site morbidity and ensuring a natural-looking outcome.[8] Given

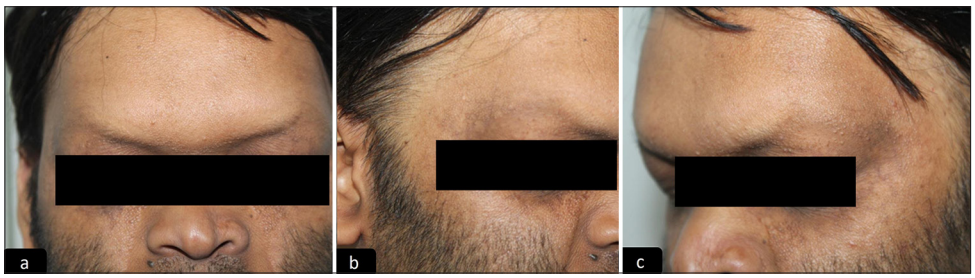

Figure 2: Baseline images show (a) frontal view, (b) right view, and (c) left view.

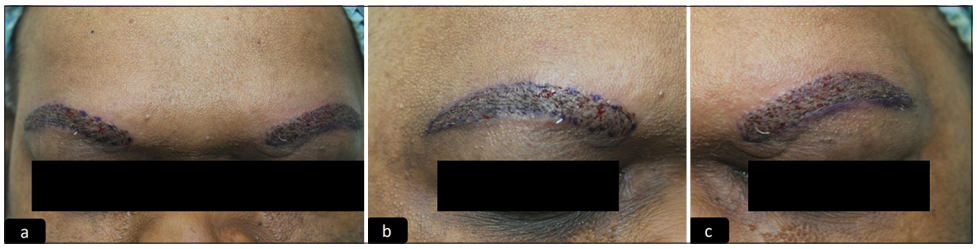

Figure 3: Immediate post-operative images (a) frontal view, (b) right view, and (c) left view.

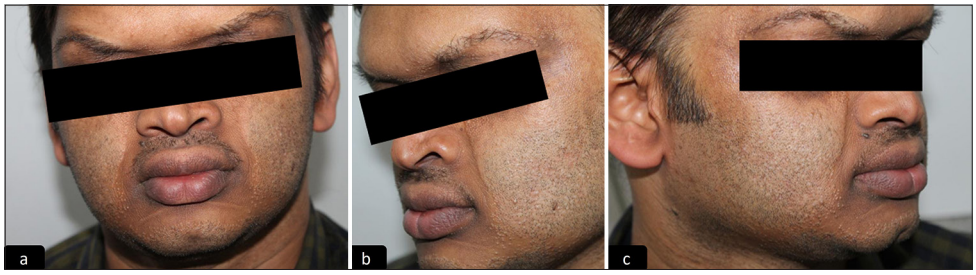

Figure 4: 6-month post-hair transplantation (a) frontal view, (b) right view, and (c) left view.

that the patient had initially considered laser hair reduction for the high beard area, selecting this region as the donor site provided a dual benefit – restoration of the eyebrows and simultaneous esthetic refinement of the beard line. The success of FUE-based beard-to-eyebrow transplantation in this case highlights several advantages. First, FUE minimizes scarring compared to traditional strip harvesting, making it particularly suitable for facial hair extraction.[9] Second, in ED patients, beard hair is softer compared to the coarse, prickly beard hair found in normal individuals. As a result, follicular grafts blend seamlessly into the eyebrow area, resulting in a natural and dense look. Post-operative outcomes were favorable, with successful graft survival, natural hair growth, and high patient satisfaction. The donor area healed well, with minimal scarring, and the patient no longer required laser hair reduction for the high beard line. This case supports the growing evidence for FUE-based beard hair transplantation as a safe and effective alternative for eyebrow restoration, especially in patients with limited scalp donor hair.

Beyond the physical improvements, the procedure had a significant psychological impact. Individuals with ED often experience self-consciousness and social withdrawal due to their distinct facial features.[10] In this case, the restoration of the eyebrows led to a marked improvement in the patient's confidence and social interactions. Before the procedure, he reported avoiding social settings due to discomfort with his appearance. After the successful transplant, he expressed greater ease in engaging with others, which contributed to a noticeable improvement in his mental well-being.

This case highlights the versatility of beard hair as a donor source and underscores the broader impact of hair transplantation beyond esthetics. By utilizing a donor site that the patient initially wanted to remove, we not only restored eyebrow hair but also addressed other cosmetic concerns in a single session. The psychological improvement observed reinforces the importance of hair restoration in enhancing both physical appearance and emotional well-being. Future studies could further explore the long-term benefits of this approach in patients with congenital hair deficiencies.

CONCLUSION

FUE eyebrow transplantation using high beard hair is a promising approach for patients with ED and other conditions associated with eyebrow hair loss. The minimally invasive nature of FUE, combined with the high survival rate of beard hair grafts, makes it an excellent alternative to scalp donor hair. Further studies with larger sample sizes are needed to establish long-term outcomes and refine donor selection criteria for optimal eyebrow restoration.

This case highlights the versatility of FUE in overcoming donor site limitations in rare conditions like ED. The dual benefits of eyebrow reconstruction and esthetic correction of a high beard line provide a template for managing similar cases, emphasizing the importance of personalized approaches in hair restoration surgery. However, further studies and long-term follow-up are necessary to evaluate the effectiveness of this approach across patients with ED.

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