

A novel treatment strategy for eyebrow transplantation in an ectodermal dysplasia patient

Mohammad Ali Nilforoushzadeh¹, Neda Adibi², Leila Mirbagher³

¹Associate professor, Skin and Stem Cell Research Center, Tehran University of Medical Sciences, Tehran, Iran. ²Researcher, Psychosomatic Research Center, Isfahan University of Medical Sciences, Isfahan, Iran. ³Medical Students Research Committee, Isfahan University of Medical Sciences, Isfahan, Iran.

Background: Ectodermal dysplasia (ED) is a hereditary syndrome which affects the ectodermal layer and thus appendages originating from this layer like hair, teeth, and sweat glands. The hairs of the scalp and eyebrows are sparse and broken and sometimes absent in ED patients. We reported a case of ED who underwent successful hair transplantation for her eyebrows. **Case Report:** A 17-year-old female with previously known ED referred to our clinic because of absent lateral eyebrow hairs. She also had hypodontia (she lacked incisor teeth) and hypohydrosis. We designed a hair transplantation procedure for the lateral third of her eyebrows with follicular unit transplantation (FUT) method. We selected the occipital part of the scalp as the donor. After 6 months and 2 years follow-up, the patient was quite satisfied with her appearance. **Conclusions:** The facial appearance of ED patients could be corrected well enough by hair transplantation methods.

Key words: Ectodermal Dysplasia, Alopecia, Hair Transplant, Eyebrow Transplant, Follicular Unit Transplantation.

INTRODUCTION

Ectodermal dysplasia (ED) is a hereditary syndrome which affects the ectodermal layer of the skin. This syndrome mostly impairs the appendages which are derived from the ectoderm including sweat glands, hair, and teeth.^[1] The severity of hair impairments in ED patients can vary, i.e. the hair may get curly, dry, fragile, and thin. ED may also affect the scalp, eyebrows, eyelashes, and pubic and axillary hairs. Total alopecia, dysplastic hair or premature hair-loss may also be caused. Additionally, the terminal hairs on the limbs and trunk can be absent.^[2-3] Changes in the appearance of patients might thus impair their quality of life and social lives. Such patients can develop psychological disorders such as depression and anxiety due to their appearance. Management strategies for patients with hair impairment are wigs and topical hair formulas to treat sparse and dry hair.^[3] A medical formula which has been shown to be beneficial for hair-loss in ED patients is the combination of topical minoxidil and tretinoin.^[4] To the best of our knowledge, follicular unit transplantation (FUT) has not yet been used for eyebrow transplantation in ED patients. The aim of this case report was to describe a novel treatment method for eyebrow hair-loss.

CASE REPORT

A 17-year-old Iranian girl who was born in Isfahan,

Iran was referred to the private office of the correspondent author in 2009. She had sparse, low density, curly, dry hair. She was born with absent lateral half of eyebrows and low dense hair in medial eyebrows (Figure 1). She had hypodontia, with the absence of central incisors in the upper and lower arches. In addition, all her teeth were cone-shaped. Her facial appearance was malformed because of the hypoplastic mandibular and maxillary bones. Further signs were mild hypohydrosis and severe xerosis of the skin. Her mother reported several episodes of intractable high grade fevers and pneumonia during her infancy. The patient's older sister had had the same manifestations but in milder degrees and she was also a known case of ED. The sister had also hypodontia and hair impairments. The intelligence quotient (IQ) of both sisters was in normal range and their educational achievements were normal as well. Ophthalmic and auditory evaluation showed no abnormality. Among their family members, only the two sisters suffered from ED and their parents had no signs of this disorder. However, they had relative marriage. In general physical examination, the patient had quite dry and scaly skin. She also had several idiopathic atrophic scars in her facial area. She had dental prostheses for upper and lower mandibular incisors. Histopathology examination of skin biopsy revealed normal epidermis with very sparse

Address for correspondence: Neda Adibi, Researcher, Psychosomatic Research Center, Isfahan University of Medical Sciences, Isfahan, Iran. E-mail: nedaadibi705@gmail.com

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primitive sweat glands. Topical emollients and several sessions of fractional CO₂ lasers for idiopathic atrophic scars in the face had been used for her skin problems. The patient was so depressed and anxious about her appearance and had about 2 years of partial social withdrawal because of her malformed facial appearance (Figure 2). She was quite ashamed because of eyebrow hair loss and had been seeking for medical treatment for a long time.

After examination, we advised the patient to undergo a hair transplant surgery. After obtaining an informed consent, we planned to perform FUT for hair transplantation. The patient was sedated by oral benzodiazepines. The donor region for transplantation was the occipital scalp. After tumescent anesthesia, the follicular units were removed from the donor area using an elliptical excision. They were carefully divided into small follicular units under a microscope. The donor tissue was separated into one to two haired follicular units in order to provide a natural appearance.

We transplanted the follicular units which contained one or occasionally two hairs into tiny incisions that were previously made by 19- and 20-gauge needling of the eyebrow skin at the same direction of the normal hair growth. We used appropriate lighting and magnification to achieve maximum precision. The whole procedure lasted 3 hours and we transplanted 60-100 hair in each lateral part of the eyebrows. The donor site was sutured with simple separate sutures which were

removed after 8 days.

After 3 days, tiny crusts were made around each follicle in the recipient site. The crusts disappeared after 6 days. The hairs began to shed after 2-3 weeks but in three months follow-up most of the hairs were regrown and the patient was quite satisfied with her appearance (Figure 3).

The patient was advised to trim the transplanted hairs regularly once a month. After 6 months and 2 years follow-up, the density of hair increasingly improved. The improvements were evident by comparing photographs which were taken using the standardized automatic option of a camera (Figures 4 and 5). The patient was quite satisfied with her appearance and also liked to have full eyebrow transplantation in order to increase hair density. The dentition was also restored with maxillary and mandibular implant prostheses.

The girl's quality of life was measured before and after the treatment by dermatologic quality of life questionnaire (DLQI). The DLQI score significantly improved after treatment. Due to her depressive symptoms and the impairment of her social functions, we advised her to visit a psychiatrist before operation. He prescribed fluoxetine 20 mg daily but because of the improvements after hair transplantation the drug was discontinued.

Her parents decided to use FUT method for eyebrow transplantation for their other daughter as well.



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5

DISCUSSION

Sparse hair and thin eyebrow are present in 72% of patients with ED.^[5] Since hairs play an important role in people's appearance, managing such problems would be of the essence in patients with ED. The specific recommended medical management for eyebrow alopecia in ED sufferers is the combination of topical minoxidil and tretinoin^[4] which shows a moderate efficacy.

General surgical methods used for eyebrow transplantation are hair-bearing flaps, free composite strip, and FUT. Recent studies demonstrated that FUT can obtain the best results in eyebrow reconstruction.^[6] This technique is now considered as the "gold standard" of surgical hair restoration. However, based our search in the web, FUT had not been used for eyebrow transplantation in patients with ED. The reason might have been the rarity of ED patients or their other significant problems which urge them to seek medical advice and to neglect their eyebrow problems. However, we utilized FUT for our case and found it to be an effective method for eyebrow transplantation in ED patients.

FUT is the result of improvement and progression of hair transplantation techniques during the decades. In this method, microscopic dissections are utilized to separate the follicular units of the donor hair in a fashion that may be similar with natural hair. Apart from natural presentation of hair, this technique is associated with low morbidity and short hospitalization. Therefore, the efficacy of this technique depends on the technician's skill and experience. Although the expected complications for FUT are uncommon, it may cause folliculitis, ingrown hairs, and pitting. Fortunately,

none of these complications occurred in our patient. On the other hand, hair growth can sometimes be out of alignment, especially in patients with wavy hair. Asymmetrical appearance as a result of improper hair direction has thus been reported as a complication for eyebrow FUT.^[7] Using FUT for eyebrow transplantation, as we found after a short-term follow-up, the patient may experience a transient hair shedding which should be described for the patient in order prevent dissatisfaction. Hairs of the scalp of an ED patient seem to be good donors for eyebrow transplantation. Nevertheless, the efficacy of FUT for hair transplantation in ED patients needs to be further explored.

CONCLUSION

We found that FUT can be a useful method for eyebrow transplantation in patients suffering from ED. However, more control studies need to be performed to suggest an effective treatment strategy for eyebrow transplantation in patients with ED.

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