

Management of Cicatricial Alopecia by Hair Transplantation using Follicular Unit Extraction

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ABSTRACT

Hair transplantation by Follicular Unit Extraction (FUE) has been commonly used in androgenetic alopecia but there is comparatively less experience with cicatricial alopecia. In this article we have discussed and reviewed various factors influencing the modality of surgical treatment in cicatricial alopecia. Although there have been many speculations about viability and results, we have noted successful results by FUE in a scar tissue. Cicatricial alopecia can be successfully managed by hair transplantation provided certain requisites are satisfied. With adept surgical skill and insightfulness we can restore good density coverage in even a compromised recipient area.

INTRODUCTION

Cicatricial or scarring alopecia is an irreversible hair loss causing permanent damage of the stem cells in the hair follicle bulge appearing as shiny atrophic patches with effacement of follicular orifices [1]. Being only confined to the scalp, it may not harm a person physically but it definitely affects the self-image and self-esteem of the patient [2,3]. The best way to reach a confirmatory diagnosis of cicatricial alopecia is by histopathological examination. Treatment usually requires a combination of medical as well as surgical intervention which comprises of hair transplantation or surgical excision [4,5].

CLASSIFICATION OF CICATRICAL ALOPECIA

Primary cicatricial alopecia involves specifically directed destruction of the hair follicle unit. They are commonly referred as 'unstable' cicatricial alopecia [6]. They have a tendency to progress and recur intermittently. Usually they require a minimum of one year of quiescence before any surgical intervention is done. Patients should be counselled about reactivation of the disease process at any time after surgery. They have been classified according to type of infiltrate seen on histopathology [7]:

- Lymphocytic infiltrate is seen in chronic cutaneous lupus erythematosus, lichen planopilaris, pseudopelade of Brocq and alopecia mucinosa.
- Neutrophilic infiltrate is seen in folliculitis decalvans and dissecting cellulitis of scalp.
- Mixed type is seen in acne keloidalis and acne necrotica.
- Secondary cicatricial alopecia involve hair follicle destruction as "collateral damage" and can be referred as stable cicatricial alopecia [6]. There is usually no need for constant vigilance after surgical treatment. They are classified according to etiology:
- Traumatic scarring due to burns, radiation, prior hair transplantation, traction alopecia and trichotillomania.
- Congenital causes include aplasia cutis, conradi-Hunermann, incontinentia pigmenti and epidermolysis bullosa.
- Miscellaneous include infections, metastatic or primary neoplasm, graft-versus-host disease.

SURGICAL EXCISION OR HAIR TRANSPLANTATION

Factors influencing the modality of surgical treatment have been enumerated below [3,7,8]:

1. Area of involvement- transplantation is preferred if scar is present in hairline, eyebrow or is a vertical or narrow scar.
2. Donor hair availability - hair transplant is a preferred treatment modality if the disease process has not yet affected the permanent donor area of scalp. However, in cases of donor-recipient area mismatch or where disease process has involved donor area, excision is preferred.
3. Scalp laxity- in cases of stiff scalp, hair transplant by FUE is a preferred method.
4. Vascular supply- poor wound healing or compromised blood supply lead to unsuccessful

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results with excision. However, the results with hair transplant would also be suboptimal in these cases and therefore need to be planned properly.

Most important factor for graft survival is vascular supply. The least vascular area is the center of a large scar. In case of compromised circulation, there can be poor growth of the transplanted grafts, necrosis (Figure 1)



Figure 1: Necrosis in recipient area in a case of cicatricial alopecia.

or infection of recipient area. To check for vascularity, anesthetize a portion of the intended area with a 2% lidocaine solution without epinephrine [7]. Then use a 19-G needle or Cut To Size (CTS) blade to make several incisions. There should be evidence of bleeding showing adequate vascularity.

HAIR TRANSPLANTATION IN CICATRICAL ALOPECIA

Hair transplantation in cicatricial alopecia can be discussed under the following headings:

1. Anesthesia

In hair transplantation, anesthesia is given in ring block technique using 2% lidocaine with 1:100000 adrenaline mixed with bupivacaine 0.5% (author's preference). Additional adrenaline is avoided in recipient area especially during tumescence.

2. Recipient site creation

Recipient sites are first created which decreases out of body time of follicles. This has further advantages such as less bleeding, more stickiness, less popping and less trauma to grafts⁷. Usually, pre-made recipient sites will start to heal making them a more fertile bed and therefore, better graft viability. The recipient area sites in tissue with greater laxity or very little recoil should be created smaller in size as compared to tissue with limited laxity or significant recoil where the slits need to be larger [7]. Recipient sites can be created with hollow-bore hypodermic needle or small blade "cut to size" [7]. The recipient site can be created by 21, 20 and 19 Gauge needle respectively for 1, 2 and 3 hair follicular unit grafts respectively.

3. Density of recipient area slits

The density of recipient area slits depends upon the vascular perfusion. In areas of low perfusion a density of 15-20 FU/cm² is preferred as compared to areas with better perfusion where a density of 20-30 FU/cm² is preferred^{7,8}. In a large scar, higher density is given in periphery as compared to center where a lower density is given. Higher density can be created by utilizing three- and four-haired FU, follicular family, or "pairing" of two smaller grafts into one incision [9,10]. It is advisable to produce lower graft densities initially and perform a second surgery in the same area 9-12 months in a staged manner (Figure 2,3,4).



Figure 2: Secondary cicatricial alopecia in a young boy at baseline.



Figure 3: Results of second staged surgery in a boy with secondary cicatricial alopecia at 3 months.



Figure 4: Results of second staged surgery in a boy with secondary cicatricial alopecia at 9 months.

4. Angle of the incision

In areas of atrophic skin a more acute angle of recipient slit creation is required as compared to hypertrophic skin where less acute angle of recipient slit at greater depth is preferred [7].

5. Graft selection

In men, donor area for extraction is usually occipital, parietal, and posterior temporal regions and in women, occipital and postero-parietal areas are preferred [8,11-13]. In case of FUE, one can 'cherry-pick' the follicular units with desirable characteristics. Even body and beard hair can be extracted in case of reduced number of donor grafts.

POSTOPERATIVE CARE

Donor area dressing is done for 2 days whereas recipient area is left open. Liposomal ATP is added to normal saline (1:10 ratio) and is applied as a spray every 2-3 hourly. Swelling and bruising can last for few days. Pain killers, antibiotics and oral steroids are given for initial 3-5 days. After removal of dressing on third post op day hair wash is commenced. Initially, almost all transplanted hair fall due to anagen effluvium. Hair regrowth begins at 4-6 months. Over the next 6-9 months, the hair follicles increase in number leading to increased density. Repeat touch up surgery is not done before 9-12 months. Patients are prescribed minoxidil (2-5%) and pentoxifyllin for 2 weeks before and at the least 5 weeks after surgery to increase blood supply. It is advisable to keep a close watch for ischemia, necrosis and infection and prompt management is required in case of any complications [7,14].

SUMMARY

It is imperative to ensure that the disease is not active before proceeding for surgery. Always evaluate thickness of the scalp and blood supply and then decide angle and depth of incision. In case of doubt, prefer taking a 'test graft' session to see grafts survival larger session. Use of epinephrine should be limited as much as possible. Avoid dense packing of grafts and do smaller sessions with lower density and use longer (9-12 months) than normal (4-6 months) intervals between sessions. Use 2-5% minoxidil pre and postoperatively to improve the blood flow [15].

CONCLUSION

With proper knowledge regarding disease stability and the required technical skill, we can successfully proceed with transplanting or excising the recipient area. Thus, it is possible to provide a reasonable coverage for areas of cicatricial alopecia improving the quality of life drastically.

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