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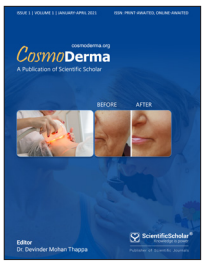

Review Article

Hair transplantation in cicatricial alopecia

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Received : 05 September 2021
Accepted : 24 September 2021
Published : 09 October 2021

DOI
10.25259/CSDM_55_2021

Quick Response Code:

ABSTRACT

Follicular unit extraction method of hair transplantation for androgenetic alopecia is quite common, but as far as cicatricial alopecia is concerned there still exists a lacuna. In this article, we have presented various factors that surgically determine the treatment outcome in cicatricial alopecia. Thus, in advanced end-stage cicatricial alopecia, it is now possible to give good results to the patient with hair transplantation.

Keywords: Cicatricial alopecia, Hair transplant, Follicular unit extraction

INTRODUCTION

Cicatricial alopecia was first described by Brocq in 1885.[1] Once the hair roots are damaged, the response to medical treatment is minimal. Cicatricial alopecia is divided into primary cicatricial alopecia where the disease affects the follicles themselves and secondary cicatricial alopecia where there is the destruction of the follicles by an external process.[2] Unger has classified cicatricial alopecia into stable and unstable cicatricial alopecia.[3] In cicatricial alopecia, there is inflammation around the bulge area as opposed to in non-scarring alopecia like alopecia areata where inflammation is around the bulb area. This results in permanent damage and loss of the hair follicle.[4]

HAIR TRANSPLANT IN CICATRICIAL ALOPECIA

Hair transplantation was first described by Dr. Okuda in 1939 in patients with traumatic alopecia.[5] Later in 1959, Dr. Orentreich described hair transplantation in androgenetic alopecia.[6] With the latest advancement in the techniques of hair transplantation, it is now one of the major treatment modalities for burnt-out inactive scarring alopecia. However, there are a few points the surgeon must be careful when it comes to hair transplantation in scarring alopecia as compared to that of androgenetic alopecia owing to poor vasculature and lesser chances of graft uptake. These are discussed in detail below.

OUTCOME OF HAIR TRANSPLANT IN DIFFERENT TYPES OF CICATRICIAL ALOPECIA

It is a well-established fact that hair transplantation in scarring alopecia has lower graft survival rates (50%) as compared to non-scarring alopecia (>90%) due to recipient area dominance.[7]

Amongst the various types of scarring alopecia the outcome of hair transplant has been found to be positive in central centrifugal cicatricial alopecia (60%), morphea (85%), pseudopelade of brocq (60%), discoid lupus erythematosus (72%), and folliculitis decalvans (40%). However, in lichen planopilaris and frontal fibrosing alopecia, it has been found to be a mixed outcome of both successful and unsuccessful graft survival. In the successful cases, there was a direct correlation between the stability of inflammation before surgery and graft survival.[8]

OUTCOME OF SURGERY IN STABLE VERSUS UNSTABLE CICATRICIAL ALOPECIA

Cicatricial alopecia is further divided into stable and unstable cicatricial alopecia, and it is vital to remember that if unstable cicatricial alopecia becomes reactivated, the surgery results would be compromised. In such cases of unstable cicatricial alopecia, surgical excision is a better choice due to the progressive nature of disease. Hence, while planning a surgical intervention in unstable versus stable cicatricial alopecia it is vital to consider the following factors: [3]

Stability of the disease

In unstable cicatricial alopecia, if the disease affects recipient area, transplanted hairs will be lost. In the scenario that the disease activity affects the donor area, it may create a donor-recipient area mismatch. Thus, in such cases due to long-term donor-recipient area ratio being unfavorable, excision is a better choice.

Availability of donor hair

The donor-recipient area ratio must be kept in mind, in view of future areas of cicatricial alopecia that may develop in unstable cicatricial alopecia. If the ratio is unsatisfactory we need to treat both existing and possibly future area of cicatricial alopecia, along with surrounding areas that may develop androgenetic alopecia (non-scarring alopecia) in the future.

Scalp laxity

The less scalp laxity, more preferable is the follicular unit extraction method of hair transplantation.

Individuals healing characteristics

Patients with a previous history of poorly healing scars, hypertrophic/keloidal scars, less than average scalp laxity, Ehlers Danlos syndrome, and coagulative/bleeding disorders are poor candidates for surgical intervention especially surgical excision.

Vascular supply

If vasculature is compromised, surgical excision is best suited as post hair transplant the follicular units may not just have poor survival but due to inadequate perfusion, there might be resulting ischemic injury and tissue necrosis.

Location of scarring alopecia

If the location of cicatricial alopecia is an easily visible area like the frontal hairline, eyebrow, or a vertical scar; hair transplant will give more favorable results.

SURGICAL EXCISION VERSUS HAIR TRANSPLANT IN CICATRICIAL ALOPECIA

Surgical excision is used to treat small, hidden, invisible, areas of unstable scarring alopecia, with as little tension as possible, in patients with good scalp laxity, history of good healing characteristics (post previous surgery), compromised vascular supply, and donor-recipient area mismatch where hair transplant is not favorable. If the scar is relatively small in the frontal hairline, hair transplant must be considered.[3]

WHEN TO DO HAIR TRANSPLANT IN CICATRICIAL ALOPECIA?

There are no clear guidelines available but the generally accepted timeline is one to 2 years of no activity in cases of primary cicatricial alopecia.[9] This can be assessed clinically as well as histopathologically. Two scalp biopsies are done 1 year apart showing no activity is usually considered sufficient. However, some authors believe in waiting for 2–5 years of no activity especially in cases like frontal fibrosing alopecia.[8,10]

WHAT METHOD OF HAIR TRANSPLANTATION IS PREFERRED?

Both follicular unit transplantation (FUT) and follicular unit extraction (FUE) methods have been used to treat cicatricial alopecia. In cases of burn scars, the scalp is very often tight making FUE the preferred method.[11] Another advantage is the ability to individually pick desirable follicular units. Body and beard hair can be used in cases of extensive scarring alopecia with a reduced number of donor grafts. Other advantages include no suturing and minimal scarring.[12]

WHAT ANAESTHESIA TO USE IN CICATRICIAL ALOPECIA?

A ring block with 2% lidocaine with 1 in 1,00,000 adrenaline can be used both in the donor as well as recipient area. Some may prefer to add bupivacaine 0.5% to the solution

depending upon the length of the surgery planned. However, it is important to avoid the use of adrenaline in tumescent anesthesia as it can lead to further vascular compromise in an already poorly vascular area of scarring alopecia.[12]

WHAT IS THE IDEAL GRAFT DENSITY?

In androgenetic alopecia, a graft density of 30–40 grafts/cm^2 or higher is usually planned. Even at higher densities of 72 grafts/cm^2, excellent graft survival is proven in non-cicatricial alopecia.[13,14] However, in the case of cicatricial alopecia, it is advisable to be on the conservative side. It is best to assess the vascularity first before deciding on the graft density.[9] This can be done by sticking the recipient area with an 18G needle and waiting for blood to appear. If the vascularity is less, hair transplant may be done at a density of 15–20 grafts/cm^2 and if the vascularity is good a density of up to 20–30 grafts/cm^2 can be planned.[3] In the first sitting, it is recommended not to go above 30 grafts/cm^2 in scarring alopecia.[9] If the patient wishes to have a higher density, a second sitting may be planned 9 months–1 year after the first surgery. The new blood vessels formed around the transplanted hair are likely to increase the blood supply in the area thus resulting in higher graft uptake during the second surgery.[15]

HOW TO DECIDE ON THE SIZE AND DEPTH OF THE SLITS?

An ideal recipient site slit provides a snug fit and allows the graft to be inserted with very little manipulation. If the recipient area is tight and fibrotic, larger slits may be preferred to avoid excessive handling of the grafts during insertion. However, if the skin has less dermal coil, it is better to plan smaller slits to reduce the chances of popping during graft insertion. If hair transplant is done on a hypertrophic scar, the chances of the grafted follicles getting enough blood supply is higher if the grafts are longer and they are placed deeper. In an atrophic scar, it is difficult for the grafts to stay in the recipient sites, and hence placing it at a more acute angle creating a posterior pocket helps to keep the grafts in place. Using more tumescent anaesthesia also makes implantation easier in atrophic scars.[3]

WHAT CAN BE DONE TO INCREASE BLOOD FLOW IN THE RECIPIENT AREA?

Since reduced blood flow in the recipient area is considered a major factor limiting the results of hair transplantation in scarring alopecia, various methods have been tried to increase the blood flow in the recipient site. The use of minoxidil 2 weeks before and 5 weeks after the surgery has been recommended by some.[16] Another drug used is oral pentoxyfylline at a dose of 400 mg thrice a day for 2 weeks before surgery.[17] Pretreatment of the recipient area with a CO_2 laser also has been tried with good results.[18]

HOW TO MANAGE THE RECIPIENT AREA?

The most vital factor for graft survival is vascular supply and the center of a large scar is the least vascular. In case of insufficient circulation, there can be poor growth of the transplanted grafts, necrosis, or infection of the recipient area.[19] Therefore, evidence of adequate vascularity needs to be checked prior as mentioned earlier in order to avoid such complications.[3,20]

WHAT IS THE PREFERABLE DONOR AREA?

In men, the donor area for extraction is usually occipital, parietal, and posterior temporal regions, and in women, occipital and postero-parietal areas are preferred.[21,22] Even body and beard hair can be extracted in case of a reduced number of donor grafts. However, in certain cases of cicatricial alopecia, due to donor-recipient area mismatch or where the disease process has involved donor area, excision is preferred.

HOW TO PROCEED WITH MANAGING A CASE OF CICATRICIAL ALOPECIA?

As far as the diagnosis of a case of cicatricial alopecia is concerned histopathology and trichoscopy are the best tools. Trichoscopy is a vital tool for assessing the donor and recipient areas for disease activity prior to hair transplant. Dermoscopic features suggestive of disease activity are as follows: [23-26]

Discoid lupus erythematosus (DLE)

Follicular plugging, perifollicular scales, telangiectasia, arborized blood vessels, follicular red dots.

Lichen planopilaris (LPP) and frontal fibrosing alopecia (FFA)

Peripilar casts, perifollicular scaling, perifollicular erythema, epidermal atrophy, absent follicular openings.

Dissecting cellulitis

Yellow dot with three-dimensional structure.

Pseudopelade of Brocq

Absent follicular openings, epidermal atrophy.

Folliculitis decalvans

Perifollicular erythema, follicular pustules, absent follicular openings.

A pre-transplant test patch can be performed by transplanting a few follicular units to observe the graft survival rate.[27] [Figure 1] It is advisable to produce lower graft densities initially and perform a second surgery in the same area after 9–12 months in a staged manner [Figure 2]. Donor area dressing is done for 2 days whereas the 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.[28] 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 the 3rd 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. It is advisable to keep a close watch for ischemia, necrosis, and infection, and prompt management is required in case of any complications.[3]

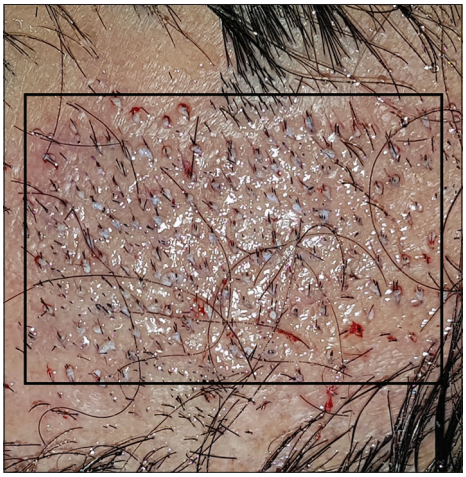

Figure 1: A test graft of 150 grafts done at 20–30 grafts/cm^2 to assess graft intake.

Figure 2: Results of hair transplant in an end-stage scarring alopecia. 1950 grafts planted at a density of 25 units/cm^2.

CONCLUSION

It is imperative to ensure that the disease is not active before proceeding with surgery. Always evaluate the thickness of the scalp and blood supply and then decide the angle and depth of the incision. In case of doubt, prefer taking a "test graft" session to see grafts survival before longer session. The 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.

Key Points

Cicatricial alopecia can be successfully treated 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.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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How to cite this article: Roga G, Thomas N. Hair transplantation in cicatricial alopecia. CosmoDerma 2021;1:54.