INTRODUCTION

Cicatricial alopecia (CA) is scarring alopecia due to a diverse group of disorders which destroy the hair follicle, replace it with scar tissue causing permanent hair loss. Spontaneous regrowth of hair in CA is rarely seen and thus it has a negative impact on the self-esteem of the patient. However, hair transplantation (HT) has emerged as an effective modality of treatment to replace lost hair for cosmetic benefit. Materials and Methods: This was a prospective analysis of patients affected with CA, who underwent HT from January 2015 to December 2017. Demography of patients along with the duration of disease, stability, biopsy, technique of HT, number of grafts, and other procedures done were noted on a pro forma and analyzed. A test patch of HT was done in all primary CA to assess stability and few secondary CA to look for graft uptake. The patients were followed up for a year and the outcomes were graded by patient and a single observer on a 10 point scale as poor, satisfactory, good, and very good at every 3 months. Results: A total of 50 patients with CA underwent follicular unit extraction. Majority of them were males (84%) with a male to female ratio of 5.25:1. Secondary CA was seen in majority (90%) of the study group. Moustache (56%) was the most common site affected, followed by scalp (22%), beard (14%) and eyebrow (8%). Around 38% (12 atrophic scars; 7 hypertrophic scars) underwent fractional CO2 laser/Erbium YAG laser with or without intralesional steroid injections in a stepwise manner prior to HT. Excellent-to-very good outcome was seen in 82% while 18% were lost for follow up. Conclusion: Scarring in CA has a significant effect on quality of life of affected patients. HT when done taking into consideration the stability of disease has good-to-excellent outcomes thus leading to a positive impact on the patient’s life.

Key words: Cicatricial alopecia, hair transplantation, scar hair transplantation
Majority 45 (90%) of the study group were affected with secondary CA and all five primary CAs were biopsy proven cases. The various types of CA seen in this study are shown in Table 1. Average duration of stability of disease was 3.6 years in primary CA. The average duration of scar was 2.2 years in secondary CA. Moustache (56%) was the most common area affected with CA, followed by scalp (22%), beard (14%), and eyebrow (8%) [Table 2]. Around 19 (38%) patients with 12 atrophic scars and 7 hypertrophic scars underwent fractional CO2/erbium YAG laser with or without ILS injections in a stepwise manner prior to HT. The donor area was occipital region of scalp in 29 (58%) patients and grafts were taken from beard region in 21 (42%) subjects. Single session of HT was done in 42(84%) whereas 7 (14%) underwent two sessions and a single patient needed three sessions of HT.

Excellent-to-very good outcome [Figures 1-4] of HT was seen in 82% patients of CA while 9 (18%) of them were lost to follow-up [Figure 5]. The average number

**Table 1: Indications of cicatricial alopecia**

| Diagnosis                     | Number of patients | Average duration of stability |
|-------------------------------|--------------------|-------------------------------|
| Primary CA                   |                    |                               |
| Pseudopelade of Brocq        | 3                  | 3.6 years                     |
| Lichen planopilaris           | 2                  |                               |
| Secondary CA                 |                    |                               |
| Post traumatic               | 38                 | 2.2 years                     |
| Post inflammatory            | 5                  |                               |
| Post surgical                | 2                  |                               |

CA – Cicatricial alopecia

**Table 2: Area of involvement of cicatricial alopecia**

| Area of involvement | Number of patients (%) |
|---------------------|------------------------|
| Moustache           | 38 (56)                |
| Scalp               | 11 (22)                |
| Beard               | 7 (14)                 |
| Eyebrow             | 4 (8)                  |

**RESULTS**

We had a total of 50 patients affected with CA who underwent HT (FUE technique) Majority of the study group were males 42(84%) with a male to female ratio of 5.25:1. The mean age was 29 years.
of grafts transplanted were 131 and in 34 (68%) patients implantation was done with stick and place method. Two cases had hypertrophy of the scar post HT. Recurrence was seen in a single case of morphea as the disease deferred stability.

**DISCUSSION**

Surgical treatment of stable CA includes HT, artificial hair fixation, primary excision of affected area, flap surgery, or scar reduction with tissue expansion.\(^1,6,7\) Due to the inflammatory process in primary CA, it needs to be ensured that the disease process has stabilized before HT is attempted. One year of disease stability is generally recommended before proceeding with a surgical modality of treatment.\(^4\) Choice of the treatment depends on the type of CA along with additional interdependent factors such as availability of donor hair, scalp laxity, the patient’s healing characteristics, vascular supply, and the location of the scar.\(^4,7\)

HT has become popular in recent years as a method of treating hair loss FUE is a less invasive technique for graft production unlike FUT which has a disadvantage of a linear scar with pain and discomfort. FUE is preferred choice in CA especially with large areas of scattered cicatrices in recipient region.\(^7,8\) We used 0.8–0.9 mm punches for follicular unit graft extraction. Although either stick and place or premade slit technique can be chosen, author preferred premade slits over stick and place method.

Premade slits must be slightly larger and deeper in tight fibrosed scar compared to same size of deeper slits in lax scar. If placed superficially, the grafts will be rejected.

CA lesions have poor graft recipient conditions due to reduced blood perfusion.\(^9\) The number of grafted follicles that survive largely depends on the blood supply of the vascular bed. Limited blood supply can increase the rate of infection, ischemia, and necrosis in the recipient area as grafting may additionally cause vascular injury.\(^9\) We have minimized this by using plain lignocaine 2% without adrenaline for local anaesthesia. A study by Kwon et al. showed that pretreatment of the recipient site with CO2 laser improved the vascularity of the recipient bed and also promoted wound healing leading to better graft uptake. The accelerated growth of transplanted hairs may be due to neoangiogenesis and induction of growth factors and cytokines during the wound healing process after laser-induced thermal damage.\(^9\) Around 38% of our patients underwent fractional CO2 and/or intra-lesional steroid injections in a stepwise manner prior to HT especially in patients with slightly hypertrophic scars and all non pliable scars.

HT in scarring alopecia has low graft survival rates (50%), especially in secondary CA compared to nonscarring alopecia (>90%).\(^10\) Higher follicular unit density is not recommended for scar HT and we followed the average density of 20–25 grafts/cm\(^2\). If more density needs to be
achieved, a second session of HT can be planned after an interval of 8–12 months. The common complications are hypertrophic scars, graft rejection, infection, and corkscrew hair.\(^{[5,6]}\) Two (4%) of our patients developed hypertrophic scar post-HT.

We observed excellent-to-very good results in majority (81.7%) of our patients. This may be due to proper case selection, adequate procedural priming prior to surgery, following surgical tips [Box 2] and use of topical medications such as minoxidil pre- and post-HT. The fact that surgery might induce a relapse should not defer the patient from pursuing HT in CA and deny them their only chance to correct the alopecic defect.\(^{[11]}\)

**CONCLUSION**

Stability of CA has to be looked into before proceeding with HT. Good outcomes are seen when other modalities like lasers, intra-lesional steroid injections are done prior to HT. The possibility of reactivation of disease taking place any time after surgery has to be clearly explained. HT when done taking into consideration the stability of the disease and good surgical techniques will give gratifying results, leading to a positive impact on the patient’s life.

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