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FOLLICULLAR UNIT TRANSPLANTATION AS PREFERRED TECHNIQUE FOR POST BURN ALOPECIA

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Abstract:

Background: *The reconstruction of facial esthetics of the burn patients to return back to their social life is of prime importance after saving life. Post burn restoration of the hair improves quality of life and appearance.* ***Aim:*** *The aim of the current study was to review post burn restoration of hair of beard, scalp hair, side locks and frontal hairline over 2 years in 96 patients with a 10 months to 2 years of follow-up.* ***Materials and Methods:*** *For a surgeon regularly doing hair transplantation, follicular unit extraction with 0.9 mm motorized punches is the technique preferred. For a surgeon occasionally doing hair transplant surgery, follicular unit transplant strip and suturing technique is recommended. Each follicular unit works as a skin micro graft that is placed 2-5 mm apart. The patients undergoing the procedure require 2-3 sittings that is spaced 8-10 months apart. And the results of follicular transplant is quite better than PRP and other techniques.* ***Results:*** *In the post burn patients hair transplants growth is delayed, it begins around 6 months after the transplant. All the hair grafts that are transplanted do not show growth together and complete result can be observed after 10 months. Patients with post burn eyebrow and mustache restoration are comparatively more satisfied.*

Conclusion: *Follicular unit micro grafting and PRP can be used for restoration of eyebrows, moustache, beard, side burns, scalp hair or hairlines but the results of follicular transplant is quite better as compared to PRP.*

KEYWORDS*: Suturing, Reconstruction, Facial Esthetics, Burn, Follicular, Frontal Hairline, Tissue Expanders.*

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INTRODUCTION:

The reconstruction of facial esthetics of the post burn patients is very important so that they may return back to social life. The reconstruction of eyebrows, scalp hair, frontal hairline, eyelash, side locks or a beard around the chin and moustache animates the face, boosts confidence and breaks the vicious cycle of self-pity, while giving the feeling of camouflage for the scars and completeness. [1] The cause of the hair loss in burns is primarily due to deep burns that may involve follicles or from excessive fibrosis, which then strangulates the follicles while creating cicatricle alopecia. The restoration of the hair is reserved as the last treatment; after all the other functional problems have been solved. The scar of the burn must be mature, mobile, not stuck to the underlying bone when hair transplantation is considered. There are various methods in the management of post burn scalp defects Work of Leedy et al., Denewer et al. [2,3] and the clinical observations led to guidelines for covering up of scalp defects or hair loss scars of burn on the scalp. 1. The primary closure after excision or scalp reduction, for defects that are away from the hairline, measuring almost 20% of the scalp with almost 85% normal scalp available for closure and undermining could still lead to scar hypertrophy or may cause gradual stretching of the scar. 2. Rotation flap, multiple banana peel flaps or transposition flap can be used for burn scars covering up to 40% of the scalp with 70% of normal scalp for movement and planning of the flaps. 3. Tissue expanders, on the other hand, can be used for burn scars covering up to 50% of the scalp with almost 50-60% of normal scalp for expansion. 4. While Micro grafting has the advantage to be used for hair less areas with up to 60% of the scalp with at least, 50% normal hair, for donor harvesting. With this technique defects of more than 60% can be covered by using body hair especially beard hair, next best is the chest hair. The larger areas on the scalp can also be managed, creating a natural hair line on front, or using a wig or hair piece for the rest of the scalp. 5. All of the post burn scars on the scalp, from 10% to 65%, can be easily transplanted with using the technique of follicular unit micro grafts. The current study was based to review post burns hair restoration with different techniques over 2 years in 96 cases with a follow-up of 9 months to 2 years.

MATERIALS AND METHODS:

The areas where post burn hair restoration was carried out in 96 patients over the past 2 years are listed in Table 1. Our method of choice for hair restoration in post burn patients is follicular unit extraction (FUE), where the natural follicles that may contain 1, 2 or 3 hair each are extracted individually with a 0.9 mm motorized punch and then implanted as hair follicular micro grafts. Other technique that is recommended for occasional Hair Transplant surgery is follicular unit transplant (FUT), that is based on excision of a strip of the scalp to yield hair follicles. A 1.2 cm wide × 6, 10, 12,14, 15 cm long strip is taken from donor dominant scalp portion at the level of the occipital protuberance. Depth of the strip is kept to the sub-dermal level. The Scalp defect is then closed in two layers. The strip of the scalp taken is then slivered along the width of the recipient area, into rows of hair containing 10-12 follicles each. Each one of these is dissected to yield natural follicular units having 1, 2 or 3 hair. These units of the donor portion are the hair grafts, that are implanted with a layout, pattern and angle to match the hair in the area of hair restoration. [4] Each of these follicular hair unit survives like a skin graft. The method of graft placement is, The hair grafts are first loaded into the needle tip the implanter device and then pushed in place with the help of a plunger[5] or follicle micro grafts be implanted using premade slits with chisel blades, in to which the grafts are placed or sub dermic needle punctures are made by other hand, and grafts are then placed immediately in the needle tracks while grabbing a forceps in the right hand, this is called “Stick and Place”.[6] In the patients of post burn scars the spacing of the hair grafts must be at 2-4 mm apart so that good graft survival can be achieved.

RESULTS:

The growth of the implanted grafts in burn areas is delayed. All the grafts do not show growth together, 35-40% of grafts grow around 5-6 months, other 40% of grafts grow in 7-8 months and the remaining grow around 10 months. The surgeon and patient should be patient enough to wait and give it the time. The complete result can be seen only after 10 months of the hair transplant. Despite waiting for the grafts scars to be mature and taking care of all of the steps in the surgery, there was still a be 5-14% loss of grafts or failure of growth. While the patients with moustache and eyebrow restoration are more satisfied. Mostly it does not only create an aesthetic landmark, but also covers the bur scar, I this way delivering double benefit. The mustache grafts can be done 2-3 sittings. Patients are counselled for 3 sittings usually. In our study, it was noted that 9% of the cases were corrected in the first sitting. While 76% required two sittings and the remaining needed three sittings. The scar skin showed improved texture and thickness after first sitting and second sitting results were better I this way. The hair grafts of the scalp grow faster than any other site and needs trimming regularly.

Figure 1

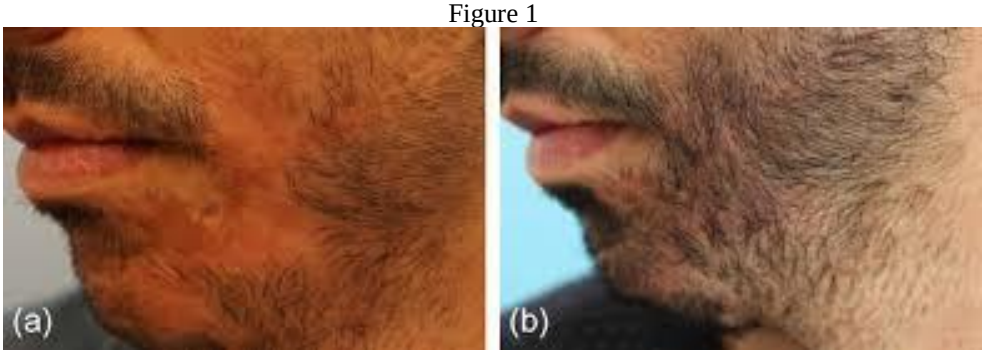
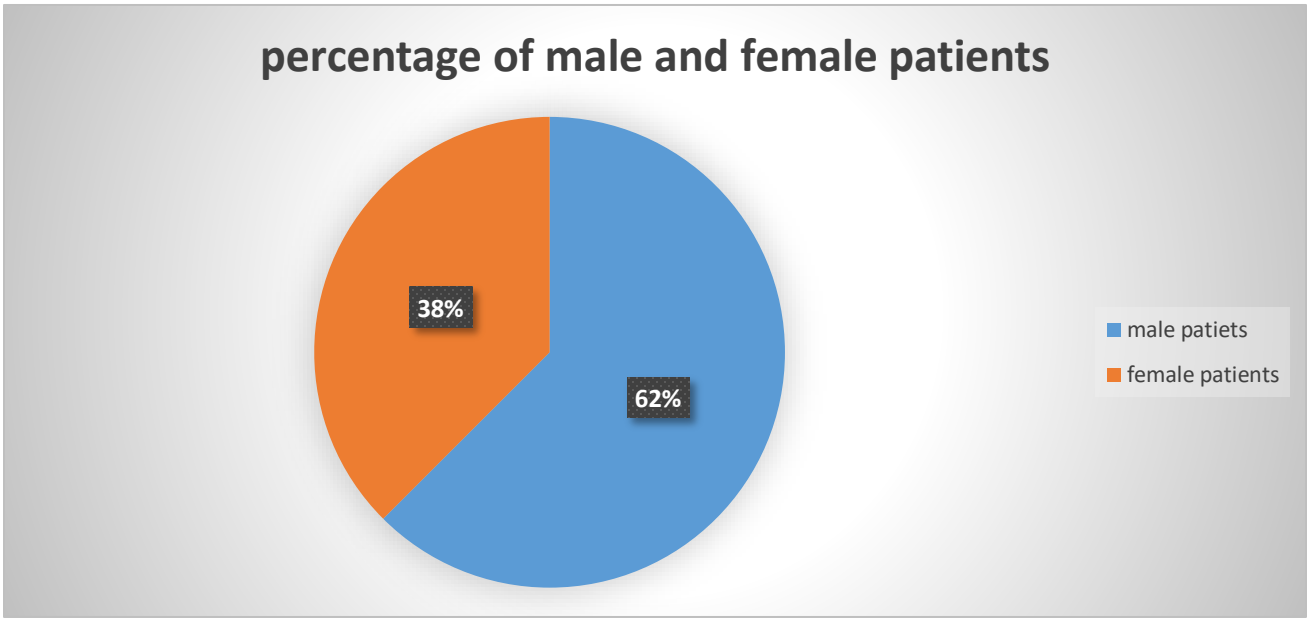


Figure 2


Figure 3


Figure 4

Area Requested	No. of Cases	No. of Grafts
Eye lashes	07	30
Eye brows	15	240
Scalp area	30	1200
Frontal hairline	09	300
Beard area	6	300
Side locks and temporal area	5	550
Moustache	06	210



DISCUSSION:

The advantage of the FUE individual extraction technique is, it avoids linear scar and suturing over the donor area. The grafts can be taken from a wide area, from all over the scalp, even if the occipital donor area is as well affected by burns that is used mostly for donation of grafts. And if the patient is short of scalp donor area, the source of donation can be extended to use of other body hair extraction. FUE does not need a large team of assistants to sliver and dissection of the grafts. With this technique, a single hair can be selected, for eyebrows, eyelashes or 2 and 3 hair units for other affected areas. [7] However, this technique requires hard training and development of skills. For an occasional hair transplant, the hair follicles may be best harvested as a strip from the scalp. Maintaining the thickness of the strip to the sub-dermal level also preserves lymphatics, nerve endings, veins, avoids neuromas, ensure faster healing. Two layered closure ensures a thin cosmetic scar. The proper use of implanters can also bypass the skill for graft placement. The use of implanters is highly recommended for surgeons who do not do regular hair transplantation surgeries. With implanters depth of placing, layout, control the angle, direction and density of the grafts as aimed with skillful Stick and Place technique to match the natural pattern in the area of hair restoration. The use of Premade slits with a 1 mm chisel blade [8] or premade tracks with 18G - 19G sub dermic needle allow the use of assistants to later, place the grafts in these already made tracks. However, in post burn scars there should be proper spacing it is observed in studies that closely spaced grafts may not work well due to reduced perfusion.

In post burn scars, the optimal spacing should be 2-4 mm, which makes sure over 90% graft survival. Further sittings may be needed to ensure good coverage and density. In burn scars, skin tracts should be created reaching to deeper vascular layer that show

punctuate bleeding from the needle pricks, which ensures placement of grafts in contact with a vascular perfused layer ensuring better survival. Needle tracks should show some elasticity and recoil to hold the grafts. Ten of the 12 studies remarked positively on the better therapeutic potential of PRP for the treatment of AGA ad post burn hair restoration. Among these studies, 6 demonstrated a statistically significant results following treatment with PRP using objective measures and the results were more pronounced in AGA than post burn hair restoration [28, 29, 33, 34, 37, 40] and 4 other studies showed hair improvement (e.g., hair density, diameter) with PRP, although no p values or statistical analysis was described [12, 32, 35, 36]. Only one study conducted by by Mapar et al. [31], concluded that PRP was not even effective in treating AGA by analysis of terminal and vellus hair count. The variations and limitations in study design have contributed to the difficulty in results interpreting across included studies. The results ad effect modifiers were stratified not only through isolated PRP or PRP with other treatments, but also by sex, subject, severity of alopecia, randomization, sample size and control groups, further obscuring the results of PRP treatment. Each study employed a very unique protocol of treatment. Of a number of the studies reviewed, 7 were based on the use of a control group [12, 28, 30, 31, 33, 34, 37], and 5 conducted without a control [27, 29, 32, 35, 36].

Five studies mentioned randomization of subjects into treatment or control groups [28, 30, 31, 33, 34] while 3 mentioned that they did not randomize subjects [12, 27, 35], introducing bias. For instance, although a good portion of studies were conducted on both male and female subjects [12, 27, 29, 33, 36, 37], others were only done on males [28, 31, 32, 34, 35] or only females [30]. because natural male and female pattern hair has different shape and hairline, it may not be appropriate to extrapolate the findings in both sexes in studies examining only a single sex. Moreover, the results and power of most of the studies was compromised due to the small sample sizes. Most studies included only 10–30 subjects [12, 27–35, 37], and the largest study examined 64 subjects [36]. While our study had 96 subjects.

CONCLUSION:

Follicular unit micro skin grafting imparts natural looking layout and replacement for hair restoration of eyebrows, eyelashes, beard, moustache, side burns, hairlines or scalp hair. It demands highly skilled personnel to work on it and it has advantage on the other techniques like PRP. The technique is demanding, time consuming, repetitive and labourous but the results are satisfying for the doctor as well as the patient.

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