Original Article

Follicullar Unit Hair Restoration Leads to Better Management of Burn and Androgenic Alopecia

Efficacy of Hair Transplantation after Burn

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ABSTRACT

Objective: To determine the efficacy of follicular unit transplantation for androgenic and post burn restoration of hair of beard, scalp hair, side locks and frontal hairline at tertiary care Hospital.

Study Design: Descriptive study

Place and Duration of Study: This study was conducted at the Islamabad Cosmetic Surgery and Department of Plastic Surgery PIMS Islamabad from February 2017 to January 2019.

Materials and Methods: Patients presented with scalp burn and androgenic alopecia, age >12 years and either of gender were included. Follicular unit extraction was used for hair restoration, where natural follicles contain 1, 2 or 3 hair and each extracted individually with a 0.9 mm motorized punch and then implanted as hair follicular micro grafts. Follicular unit transplant (FUT) was based on excision of a strip of the scalp to yield hair follicles. Patients underwent the procedure during 2-3 sittings that is spaced 8-10 months apart. Efficacy was recorded in terms of patient's satisfaction. Data was entered in self-made proforma.

Results: Total 78 patients were studied their mean age was 28.23±6.11 years. Males were in majority 61.5%. Out of all 38.5% of grafts grew during 5-6 months, 41.0% of grafts grew in 7-8 months and remaining grew in around 10 months. Survival rate was 84.6% and non-survival rate was 15.4%. Most of the patients were satisfied.

Conclusion: Follicular unit transplantation for post burn and androgenic restoration of hair showed best efficacy with excellent survival rate and patients satisfaction. 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 and less noticeable surgical scars.

Key Words: Burn Alopecia, Follicular Unit Hair Transplantation

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INTRODUCTION

The reconstruction of facial esthetics of the post burn patients is very important so that they may return towards 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.

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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 and the clinical observations led to guidelines for covering up of scalp defects or hair loss scars of burn on the scalp.[1-3] 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 easily be transplanted with using the technique of follicular unit micro grafts. In patients having burn alopecia or hair loss, their treatment can often be a challenge to patients and surgeons both. Recent surgical techniques of hair transplant via follicular unit extraction of strip follicular unit transplant has become the choice treatment for alopecic areas that needs more advanced consequences.[6] Beard, scalp, eyelash and eyebrow hair loss have adverse impact on the burn survivors self-stream and even if surgery is not an option.[20] However current study was based on post burns hair restoration by follicular unit extraction with a follow-up of 9 months to 2 years

MATERIALS AND METHODS

This descriptive study was conducted at Islamabad cosmetic surgery and department of plastic surgery of PIMS Islamabad with duration of 2 years, during February 2017 to January 2019. Patients those having burn and androgenic alopecia, age >12 years and either of gender were included in the study. Patients those having infection, diabetes, open wound and those were agreeing to participate in the study were excluded. Inform consent was taken from the patients. Patients underwent complete medical history and clinical examination accompanied by required laboratory investigations including complete blood count, bleeding time (BT), clotting time (CT) and prothrombin time. Method of follicular unit extraction (FUE) was used for hair restoration in post burn patients, 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 for occasional Hair Transplant surgery was 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 was taken from donor dominant scalp portion at the level of the occipital protuberance. Depth of the strip was kept to the sub-dermal level. The Scalp defect was 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 were the hair grafts that were implanted with a layout, pattern and angle to match the hair in the area of hair restoration. Each of this follicular hair unit survives like a skin graft. In graft placement method, the hair grafts first loaded into the needle tip of implanter device and then pushed in place with the help of a plunger, 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”. In the patients of post burn scars the spacing of the hair grafts was at 2-4 mm apart to good graft survival achievement. Efficacy was evaluated in terms of amelioration of scar area and patients satisfaction. Amelioration of scar area was categorized according to percentage of amelioration as; 0%–25% fair, 26%–50% moderate, 51%–75% good, 76%–100% excellent.[7] Patients satisfaction was evaluated by Likert scale as; 0 for unsatisfied, 1 for slightly satisfied, 2 for indecisive, 3 for satisfied, and 4 for very satisfied.[7]

RESULTS

Table No.1 Demographic characteristics of the patients n=78

Variables	No. of cases (%)
Gender	
Male	48(61.5%)
Female	30(38.5%)
Area Requested	
Eye lashes	07(09.0%)
Eye brows	15(19.2%)
Scalp area	30(38.5%)
Frontal hairline	09(11.5%)
Beard area	06(07.7%)
Side locks and temporal area	05(06.4%)
Moustache	06(07.7%)
Age (mean±SD)	28.23±6.11years

Table No.2: Growth duration of implanted grafts in burn areas and survival rate n=78

Variables	No. of cases (%)
Growth duration	
5-6 months	30(38.5%)
7-8 months	32(41.5%)
9-10 months	16(20.5%)
Survival rate	07(09.0%)
Survival	73(06.4%)
Failure	05(93.6%)

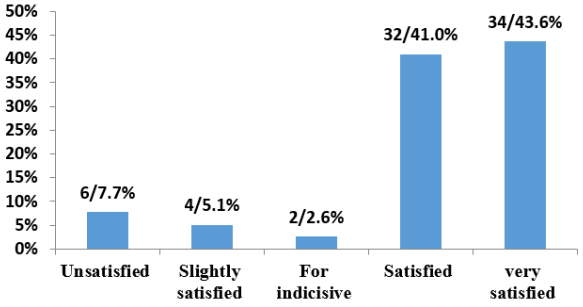

Figure No.1. Satisfaction of the patients n=78

Total 78 patients were studied; their mean age was 28.23±6.11 years. Males were in majority 61.5% and females were 38.5%. Most of the patients 38.5% presented with scalp area, followed by eye brows 19.2%, frontal hair line 11.5%, eye lashes 9.0%, beard area 7.7%, side locks and temporal area 6.4% and moustache was in 7.7% patients. Nine percent of the cases were corrected in the first sitting, 60(76.9%) required two sittings and the remaining were corrected within three sittings Table.1 The growth of the implanted grafts in burn areas was delayed. All the grafts did not show equal growth, 38.5% of grafts grew around 5-6 months, 41.0% of grafts grew in 7-8 months and the remaining grew in around 10 months. Survival rate was 93.6% and non-survival rate was 6.4%. Fig.1
Most of the patients 43.6% were very satisfied and 41.0% were satisfied, while 7.7% were unsatisfied, 5.1% were slightly satisfied and 2.6% were indecisive. Table.2

Figure No.2: Post burn alopecia of forehead and eyebrow transplant

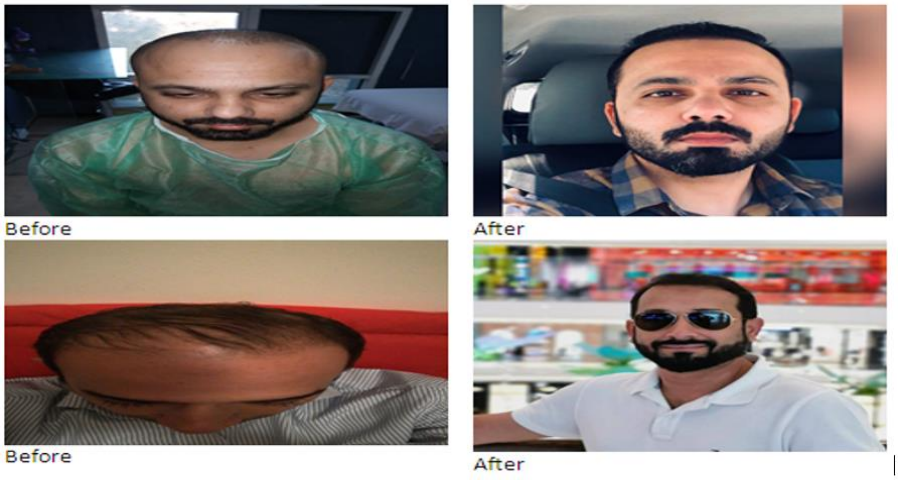

Figure No.2: Post burn alopecia of forehead and eyebrow transplant

DISCUSSION

Burn injuries, may cause by scalds (including steam, hot water and cooking oils), electrical injury, by chemical or flame, may be isolated to the head and neck areas or be a part of injuries affecting a larger total body surface area.[6,8,9] Hair follicular destruction is typically linked to deep burns, the nature of which also results in severe scarring and which makes hair transplantation more challenging.[8] In this study males were in majority 61.5% and females were 38.5% and patients mean age was 28.23±6.11 years. Similarly, Mohmand MH et al[10] reported that males were in majority as compared to females and patients' mean age was 28.53 years. While inconsistently Tayyaba F et al[11] reported that males were 26.67% and females were 73.33% with average age of 21years.

In this study, most of the patients (38.5%) presented with scalp area, followed by eye brows (19.2%), frontal hair line (11.5%), eye lashes (9.0%), beard area (7.7%),

side locks and temporal area (6.4%) and moustache in 7.7% of cases. Rajput R et al[12] stated that follicular unit micro grafting can be used for restoration of eyebrows, eyelashes, moustache, beard, side burns, hairlines or scalp hair. El Sakka DM et al[13] also found females in majority (63.33%) as compared to males (36.66%). This gender difference may due difference in sample selection because in this study androgenic alopecia was more. In this study, all the grafts did not show equal growth, 38.5% of grafts grew in around 5-6 months, 41.0% of grafts grew in 7-8 months and the remaining grafts grew in around 10 months. However, Rajput R et al[12] stated that 9% patients were corrected in around one sitting, 77% required two sittings, and 14% required three sittings for satisfactory restoration. In burn scars, patients and surgeons had to wait due to poor circulation. Distortion of angle and wavy growth appeared with grafts implanted in post burn scars. This is due to the fibrosis in the bed and adherence between the tissue layers. The distortion will be less pronounced in the subsequent hair cycles and the hair will set gradually well in the next 8-10 months. Initially, the hair growing out is squeezed through the scar.[12]

In this study survival rate was 93.6%. Mohmand MH et al[9] observed that survival rate of FU transplants ranged from 70 to 90%, with an average of 80.67%. On the other hand, Tayyaba F et al[11] reported that total reconstruction of post burn alopecia was achieved in around 90% of cases. Beehner et al[14] compared FUE and FUT, and survival rates were 86% and 61.4% respectively after 14 months. Lee SJ et al[15] also reported that mean survival rate of total number of hair transplantations was 92.0 to 90.4% after six to nine months of transplantation. Jung S, et al[16] stated that follicle transplantation showed excellent results in 44.4% of cases, good results in 38.9%, fair in 11.1%, and poor in 5.6% of cases. In this study, most of the patients (43.6%) were very satisfied, 41.0% were satisfied and 5.1% were slightly satisfied, while 7.7% were unsatisfied and 2.6% were indecisive. While, Civas E et al[7] also reported that 86.7% were satisfied and 13.3% of patients were very satisfied. We agreed with the statement of Civas E et al that satisfaction or dissatisfaction of the patients may also be related to the knowledge about the natural hair (i.e., quality, direction, and density) which had been present in the recipient scar area prior to the development of cicatricial alopecia,[7] and another important factor that increases patient's satisfaction with the hair transplantation treatment of l alopecia is the acquisition of thorough information about the treatment and realistic expectations from the procedure before the operation.[7] Future studies are needed on this treatment option by taking patients' satisfaction in consideration.

CONCLUSION

Follicular unit transplantation for restoration of hairs showed best efficacy with excellent survival rate and patients satisfaction. 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 and less noticeable surgical scars are another advantage of follicular unit extraction. The technique is the time consuming, repetitive and labourous but the outcome is the satisfying for the doctors and patients both.

Author's Contribution:

Concept & Design of Study:	Abdul Khaliq
Drafting:	Zarish Daniel
Data Analysis:	Naima Javed
Revisiting Critically:	Abdul Khaliq, Zarish Daniel
Final Approval of version:	Abdul Khaliq

Conflict of Interest: The study has no conflict of interest to declare by any author.

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