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Comprehensive evaluation of full thickness skin grafts for facial resurfacing

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Abstract

Background: Different modalities of treatment have been used for facial resurfacing like excision and reconstruction, skin grafting spilt thickness or full thickness etc. Present study was aimed to study full thickness skin grafts for facial resurfacing at a super-specialty hospital. **Material and Methods:** Present study was case record based, retrospective study, conducted in patients underwent full thickness skin grafts for facial resurfacing at our hospital were analysed. **Results:** In present study, 14 cases underwent facial resurfacing at our hospital were studied. Majority cases were from less than 30 years age group (66.67 %) & female (86.67 %). Common etiology was burns scar (46.67 %), congenital pigmented nevus (20 %), basal cell carcinoma (13.33 %), xeroderma pigmentosa with multiple basal cell carcinoma (6.67 %), post traumatic (6.67 %) & post infective (6.67 %). Majority cases underwent resurfacing for forehead/chin/cheek/eyelid aesthetic unit area grafting. Common donor site area was from groin, postauricular & thigh region. Complications noted among recipients were CPN remnant at the forehead (4.35 %), Lower lid ectropion (4.35 %) & 1 x 0.5 cm marginal graft loss (4.35 %). While in donors were right groin stretching (4.35 %) & stretching (4.35 %). Total grafts were done at 23 sites. We noted results at 6 months follow up, as per patient's evaluation, colour match was good (52.17 %) & fair (39.13 %) in majority of cases., texture match was good (52.17 %) & fair (39.13 %) majority of cases. At junctional area, hypopigmentation (60.87 %) & stretching (17.39 %) was noted in majority of cases. **Conclusion:** Full thickness skin grafts for facial resurfacing gives the most satisfactory results when an entire facial aesthetic unit is resurfaced with full thickness skin grafts.

Keywords: functional restoration, full thickness skin grafts, facial resurfacing, plastic surgery

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Introduction

Medical and aesthetic skin procedures have seen a steady surge within the last decade largely stemming from greater numbers of new skin cancer diagnoses and a higher demand for skin rejuvenation practices. With this greater demand for skin resurfacing, selecting an appropriate treatment modality for the patient's skin type and condition is critical for a successful skin resurfacing therapy.[1]

Apart from primary closure and secondary healing, there is a broad range of possible reconstruction methods, such as skin autografts, local flaps, distant/regional flaps, and microvascular free tissue transfer.[2,3,4] The facial region is especially sensitive with respect to

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the selection of an appropriate reconstruction method to provide functional and aesthetically pleasing results.[2,3,4]

Different modalities of treatment have been used for facial resurfacing like excision and reconstruction, skin grafting spilt thickness or full thickness etc. Controversy still exists regarding which method of reconstruction should be used and how long they should be continued.[5,6] It is an accepted fact that adjacent skin gives the best colour and texture match. However, when facial disfigurement, whether due to burns, trauma or malignancy involves a large area of the face, the adjacent skin is usually not sufficient for resurfacing the defect. Present study was aimed to study full thickness skin grafts for facial resurfacing at a super-specialty hospital.

Material And Methods

Present study was case record based, retrospective study, conducted in Department of Plastic Surgery, Government Medical College & Hospital, Chhatrapati Sambhajinagar, India. Cases underwent facial resurfacing at our hospital in last 5 years were studied. Study approval was obtained from institutional ethical committee.

Case records of patients underwent full thickness skin grafts for facial resurfacing at our hospital were analysed. Cases with chemical burns of the eyelids and those who had undergone some surgical intervention for their post-burn contractures at other hospitals were excluded.

Details such as thorough history, socio-demographic profile, type of burn injury, physical examination findings, laboratory investigations & final diagnosis were noted.

All patients underwent surgery under general anaesthesia or local anaesthesia, for full thickness skin grafts for facial resurfacing. Results at 6 months follow up for total 23 sites were collected for Colour Match (G-Good, F-Fair & P-Poor), Texture Match (G-Good, F-Fair & P-Poor), Junctional Area (PA-Hyperpigmentation, P.-Hypopigmentation, HYT-Hypertrophy & S – Stretching). Separate entries were made for Surgeon's evaluation & Patient's evaluation.

Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Statistical analysis was done using descriptive statistics.

Results

In present study, 14 cases underwent facial resurfacing at our hospital were studied. Majority cases were from less than 30 years age group (66.67 %) & female (86.67 %). Common etiology was burns scar (46.67 %), congenital pigmented nevus (20 %), basal cell carcinoma (13.33 %), xeroderma pigmentosa with multiple basal cell carcinoma (6.67 %), post traumatic (6.67 %) & post infective (6.67 %).

Table 1: General characteristics

	No. of patients	**Percentage**
Age groups (in years)		
<20	4	26.67 %
20-29	6	40 %
30-39	2	13.33 %
40-49	2	13.33 %
50-59	1	6.67 %
Mean age (mean ± SD)		
Gender		
Male	2	13.33 %
Female	13	86.67 %

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In present study, majority cases underwent resurfacing for forehead/chin/cheek/eyelid aesthetic unit area grafting. Common donor site area was from groin, postauricular & thigh region.

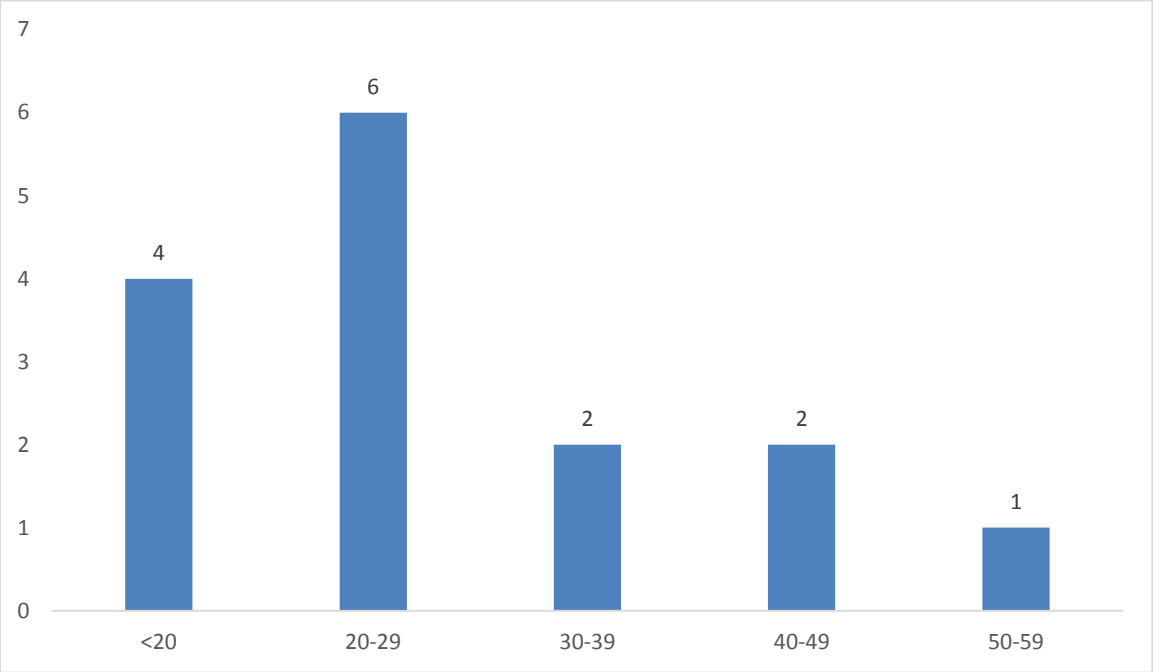

Chart 1: Age-group distribution of patients

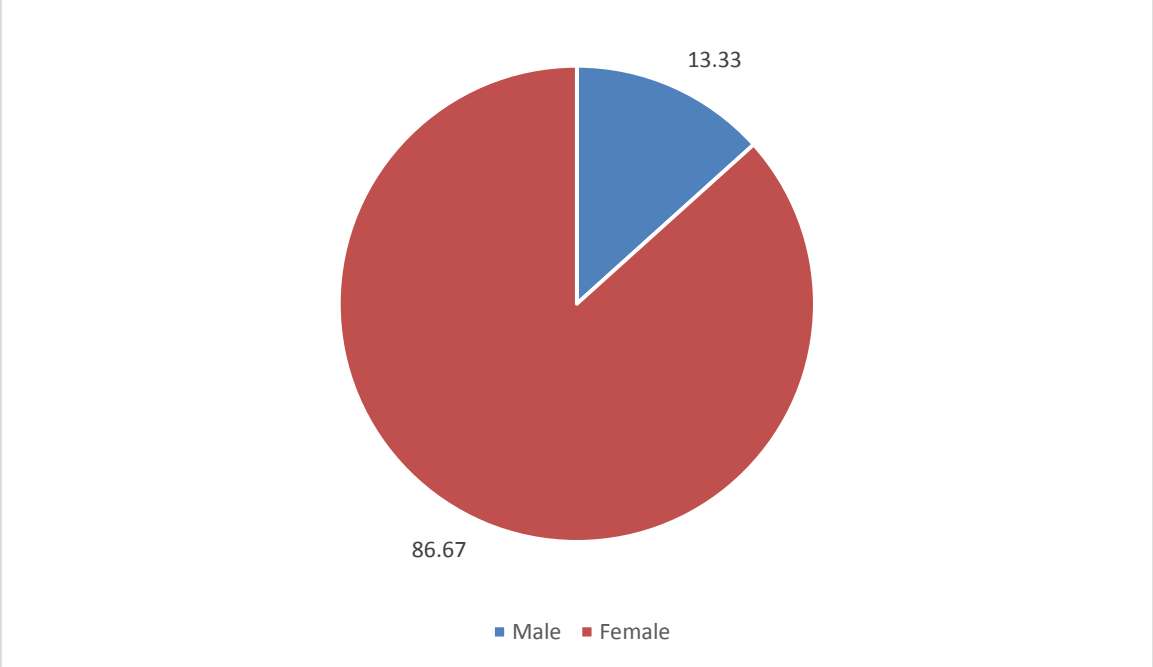

Chart 2: Gender wise distribution of patients

Table 2:Defect etiology

Burns scar	7	46.67 %
Congenital pigmented nevus	3	20 %
Basal cell carcinoma	2	13.33 %
Xeroderma pigmentosa with multiple basal cell carcinoma	1	6.67 %

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 01, 2023

Post traumatic	1	6.67 %
Post infective	1	6.67 %

Table 3: Area grafted

	Area grafted	**Percentage of area of unit**	**Donor site**
1	Forehead aesthetic Unit	100 %	Thigh
	Right Cheek	70 %	
	Nose	100 %	
2	Left forehead,	10 %	Postauricular
	Temporal & upper eyelid	100 %	
3	Forehead aesthetic unit	100 %	Bilateral groin
	Chin aesthetic unit	100 %	
4	Left 1/2 lower eyelid, temporal & infra-orbital region	80 %	Medical arm superficial temporal fascia & palatal mucosa
5	Left infraorbital	2 %	Bilateral Postauricular
	Preauricular	2 %	
	Right cheek	2 %	
6	Chin aesthetic unit	100 %	Groin
7	Chin aesthetic unit	100 %	Groin
8	Left Temporal	100 %	Postauricular
9	Right upper eyelid	100 %	Groin
10	Dorsum of nose	100 %	Postauricular
11	Right cheek aesthetic unit	100 %	Groin
	Dorsum of nose	90 %	
12	Right cheek aesthetic unit	100 %	Groin
13	Left cheek aesthetic unit	60 %	Groin
14	Bilateral lower eyelid	100 %	Bilateral Postauricular
15	Chin aesthetic unit	100 %	Groin

In present study, complications noted among recipients were CPN remnant at the forehead (4.35 %), Lower lid ectropion (4.35 %) & 1 x 0.5 cm marginal graft loss (4.35 %). While in donors were right groin stretching (4.35 %) & stretching (4.35 %)

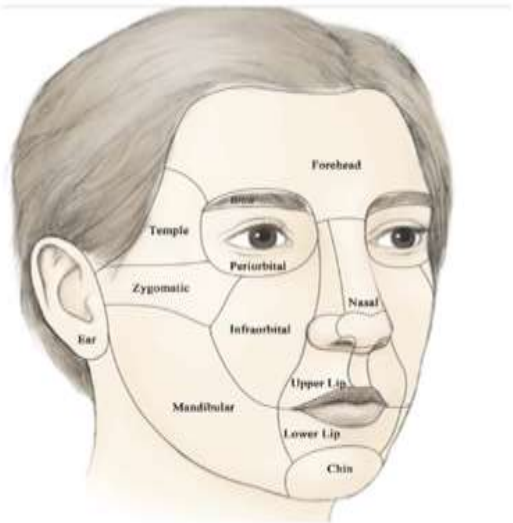

Figure 1

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 01, 2023

Table 4: Complications

Complication	No. of patients	Percentage
Recipient		
CPN remnant at the forehead	1	4.35 %
Lower lid ectropion	1	4.35 %
1 x 0.5 cm marginal graft loss	1	4.35 %
Donor		
Right Groin Stretching	1	4.35 %
Stretching	1	4.35 %

Total grafts were done at 23 sites. We noted results at 6 months follow up, evaluation done by surgeon as well as patient. As per surgeon's evaluation, colour match was good (43.48 %) & fair (39.13 %) in majority of cases, texture match was good (60.87 %) & Fair (30.43 %) in majority of cases. At junctional area, hypopigmentation (60.87 %) & stretching (17.39 %) was noted in majority of cases. As per patient's evaluation, colour match was good (52.17 %) & fair (39.13 %) in majority of cases., texture match was good (52.17 %) & fair (39.13 %) majority of cases. At junctional area, hypopigmentation (60.87 %) & stretching (17.39 %) was noted in majority of cases.

Table 5: Results at 6 months follow up (23 sites)

Results	No. of patients	Percentage
1.Colour Match		
Surgeon's evaluation		
G-Good	10	43.48 %
F-Fair	9	39.13 %
P-Poor	4	17.39 %
Patient's evaluation		
G-Good	12	52.17 %
F-Fair	9	39.13 %
P-Poor	2	8.7 %
2.Texture Match		
Surgeon's evaluation		
G-Good	14	60.87 %
F-Fair	7	30.43 %
P-Poor	2	8.7 %
Patient's evaluation		
G-Good	12	52.17 %
F-Fair	9	39.13 %
P-Poor	2	8.7 %
3.Junctional Area		
Surgeon's evaluation		
PA-Hyperpigmentation	3	13.04 %
P.-Hypopigmentation	14	60.87 %
HYT-Hypertrophy	2	8.7 %
S - Stretching	4	17.39 %
Patient's evaluation		
PA-Hyperpigmentation	3	13.04 %
P.-Hypopigmentation	14	60.87 %
HYT-Hypertrophy	2	8.7 %
S - Stretching	4	17.39 %

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 01, 2023

Discussion

In this review of the cases operated with full thickness skin graft for Facial defects of various etiologies, the resurfacing of the defect with a full thickness skin graft approximates more closely to normal skin in colour, texture and resilience. The method is relatively simple, reliable and safe needing minimal post-operative care and with minimal or no complications and sequelae.

Skin grafts are used in a variety of clinical situations, such as traumatic wounds, defects after oncologic resection, burn reconstruction, scar contracture release, congenital skin deficiencies, hair restoration, vitiligo, and nipple-areola reconstruction.[7,8] If the skin graft includes the entire thickness of the dermis, the appropriate term is full-thickness skin graft (FTSG). Full-thickness skin grafts are not widely used for emergency burn care but are ideal for the reconstruction after initial treatment and for scar corrections.[9]

Facial and scalp reconstruction following wide tumor resection is a continuous challenge for Plastic Surgeons. An optimal reconstruction should guarantee a successful coverage and protection of exposed planes, maintaining a soft-tissue bulk and contour, with good aesthetical outcomes.

In study by Allam AM et al.,[10] monoblock expanded full-thickness skin graft for facial resurfacing after post-burn sequelae excision was used in 12 young patients after expansion of the superolateral aspect of the buttock. Females made up the majority of the patients (75%) and the ages ranged between 8 and 18 yr. The operating time was 3-3.5 hours, in two sessions. Post-operatively, we recorded partial graft necrosis in two cases (16.7%) and infection in one (8.3%), and some minor donor-site related complications were reported, such as hematoma in one patient (8.3%), wound infection in one patient (8.3%), and wide scarring in two patients (16.7%). At follow-up, eight of the patients (66.7%) were satisfied with their new facial look as the mask effect of facial scarring had been overcome. With monoblock expanded full-thickness graft we were able to resurface the face in nine cases (75%). A second complementary procedure to reconstruct the eyebrows or reshape the nose was required in two cases (16.7%).

Severe full-thickness eyelid defects seriously endanger the health and beauty of the ocular surface. It is the most challenging reconstructive surgery to reconstruct eyelid's natural appearance and function, in which the posterior eyelid lamella plays an essential role. Without enough substitute support in eyelids suffered sizeable posterior lamella defects, various complications may occur, e.g., entropion, ectropion, incomplete eyelid closure, corneal irritation, keratitis, corneal ulcers, and even vision loss, leading to failure of eyelid reconstruction.[11]

With ablative and nonablative laser resurfacing rising in popularity and becoming more accessible, surgeons have considered whether it is appropriate to use this augmenting technique pre, post, or perioperatively to achieve the greatest benefit with the highest safety profile.[12,13] Although such nonsurgical therapies offer a multitude of benefits for patients, there are limits to their application, and ultimately some patients will require facial plastic surgery to achieve their goals.[14,15]

In study by Lakhani N,[16] majority patients were of age between 20-30 years. 72.22% patients had other associated burn injuries with facial involvement. Most patients (18, 90%) were treated after 9 months post burns duration. All patients had multiregional involvement on face but cheek being the largest unit, was most commonly involved (18, 90%) followed by involvement of oral commissure and lips in 8 (40%) and orbital region in 7 (35%) patients. Full thickness skin graft (FTSG) and split thickness skin grafts (STSG) were most commonly performed procedures.. Common complications included hyperpigmentation and hypopigmentation, contour distortion and obliteration of labiomental sulcus. Facial reconstructive procedure for burns scars should be selected based on region of face involved.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 01, 2023

Skin grafting is an effective method for reconstruction especially in areas with non-availability of advanced treatment modalities.[16]

The long-term results have shown that flaps perform better than full-thickness skin grafts in providing a safe and effective method to resurface post-burn scar contractures in the face with better aesthetic results. However, most problematic late outcomes that Philip et al. identified after facial burns included gaps between grafts and hairline, eyelid ectropion, nose asymmetry, and marked hypertrophic scarring around the lip.[17]

In present study, there were few punctate losses in few of the cases during the graft take which settled down with conservative treatment over a brief period of time. There were no major complications except a lower eyelid ectropion that could be ascribed to the weight of the superficial temporal fascia flap with palatal mucosa graft, but this settles down with time and a local physiotherapy and massage. The other complication was an iatrogenic positive margin of congenital pigmented nevus that required revision. All donor areas healed well excepts stretching and hypertrophy in few cases.

Conclusion

Full thickness skin grafts for facial resurfacing is a simple procedure, should be executed with all the standard principles of plastic surgery. It gives the most satisfactory results when an entire facial aesthetic unit is resurfaced with full thickness skin grafts.

Conflict of Interest: None to declare
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ISSN: 0975-3583,0976-2833 VOL14, ISSUE 01, 2023

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