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Innovative Approaches to Facial Reconstruction Post Severe Burn Injuries: A Comprehensive Study

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Abstract: ***This research paper presents a comprehensive study on the impact of various reconstructive techniques, including microsurgical reconstruction, local flap procedures, and tissue expanders, on patients with complex facial burns. The study, conducted from January 2017 to October 2022, involved 30 patients who underwent these procedures. The paper discusses the factors that influence the decision - making process for successful reconstruction and evaluates the quality of reconstruction. The results highlight the importance of early planning and intervention, and the effectiveness of a combination of modalities in achieving better outcomes in extensive facial burns.***

Keywords: Facial Burns, Microsurgical Reconstruction, Tissue Expanders, Reconstructive Surgery, Burn Injury Management

1. Introduction

The face is the cover by which people judge the book. Burns involving the face are a challenge and opportunity like no other to the reconstructive surgeon and leaves him wishing for more and more weaponry in his ever - expanding armamentarium to tackle this difficult problem.1

The human face is unique in development for its complexity in structural architecture, its seamless symphony in functionality.

The skin of face and neck is commonly exposed to flame burns, boiling water, steam and caustic agents.

Face and neck reconstruction is considered as one of the most important and most difficult surgeries in cosmetic and reconstructive surgery.1

Most commonly facial deep burns occur in both epileptic and electric burn patients.

In rural setup in India where floor level cooking is very common, facial burns are not rare.

Face, Upper limbs and trunk are the common areas involved in burn injuries in epileptics.2

The patient may fall flat on the fire while having convulsions or fall spilling hot liquid on themselves.

Electric burns having contact points in head and neck area will cause deep burns.

Aim of Study

In our study, our aim is to evaluate the impact of microsurgical reconstruction, local flap procedures, tissue expanders in burn patients in terms of quality of reconstruction, and to determine factors for decision making for a successful reconstruction in this unique cohort of patients.

2. Material and Methods

This hospital based study was conducted on patients admitted in our institution with complex facial burn from 1st January 2017 to 31st October 2022.

Thirty patients of complex facial burn who underwent local, loco regional, micro vascular reconstruction and tissue expanders were included.

All patients undergoing reconstruction for burn injury were evaluated in terms of flap survival, time interval between burn injury and surgery, site of defect, type of flap used, number of components transported along with the flap, and number of tissues reconstructed.

3. Results

Most of the patients were in the middle age group 21 - 40 years.
There were 12 males and 18 females.
20 patients underwent microvascular reconstruction following skin grafts, local and locoregional flap procedures.
4 were treated with tissue expansion following microvascular reconstruction.
6 patients were treated with tissue expansion following SSG, local, loco - regional flap procedures.

Table 1: Distribution of patients along with timing of surgery and success rate

Time of Intervention	Total	Successful	Failed	(Success Rate)
Immediate (<5 Days)	8	7	1	87.5%
Early (5- 21Days)	5	4	1	80%
Intermediate (3- 6 weeks)	4	4	0	100%
Late (>6weeks)	13	11	2	84.6%
	30	25	5	83.33%

Case 1: After grafting over scalp secondary reconstruction with Free ALT flap was done along with prosthetic eye

Case 2: 12 Year old male child with post burn scar alopecia following Local transposition flap + Split Skin Grafting

Case 3: 30/m Post burn scar over face, Free Radial forearm flap was done.

Flap advancement following the tissue expansion of free radial forearm flap

4. Discussion

Although most burn wounds are covered by a split thickness skin graft, burn injuries often result in complex wounds with exposed vital structures that are not amenable to skin grafts.[1]

Their destructive nature also limits the availability of healthy tissue in the close vicinity of the defect, thus limiting the use of local flaps.[3]

Complexity and extensive defect size following debridement are also major deterrents.

In Children it is difficult to maintain the splintage following skin grafting in the neck, therefore tissue expansion becomes the safe modality for better aesthetic outcome.

The choice of reconstructive procedure is dependent upon several factors, including size, location, involvement of deeper structures, etc. Numerous rotation, transposition and other forms of local flaps are described through which we can effectively tackle full thickness skin defects reaching good functional and aesthetic results.

These flaps guarantee the same texture thickness and colour as the adjacent skin sometimes with a minimal donor area morbidity.

Instead of considering steps of reconstructive ladder we can take elevators where according to patients need we can customize the type of reconstructive procedure. If joints, bone, vessels or nerves are exposed we can use local flaps. However damage of soft tissues surrounding the zone of injury may require the use of flap harvested from distant donor sites.

Tissue expansion attempts to achieve most of the goals of reconstruction like replacing like with like, give good colour texture and sensation match.

The benefits of tissue expanders have to be weighed against the cons like cost factors, risk of infection, exposure and requirement of high motivation and compliance on the part of patient.

5. Conclusion

The study concludes that patients with electric and epileptic conditions often suffer from full - thickness facial burns. Early excision and reconstructive surgery yield better results. Tissue expanders, providing colour - matched autologous tissue, are beneficial for delayed deformity correction. A combination of skin grafting, local and loco - regional, microsurgical reconstruction, and tissue expanders, when planned and implemented early, can significantly improve outcomes in extensive facial burns.

References

[1] Neligan, Peter, et al. “Management of Burned Face. ” *Plastic Surgery*, Fourth ed., vol.4, Elsevier, London, 2018, p.445.

[2] Akhtar MS, Ahmad I, Khan AH, Fahud Khurram M, Haq A. Burn injury in epileptic patients: an experience in a tertiary institute. Ann Burns Fire Disasters.2014 Sep 30; 27 (3): 126 - 9. PMID: 26170789; PMCID: PMC4441316.

[3] Monga K, Goil P. Single - Stage Composite Reconstruction Of Complex Electrical Burn Defects By Microvascular Techniques - A Prospective Study. Ann Burns Fire Disasters.2021 Mar 31; 34 (1): 75 - 82. PMID: 34054390; PMCID: PMC8126366.

[4] Sarabahi, Sujata, et al. “Facial Burns. ” *Principles and Practice of Burn Care*, Jaypee Brothers Medical Publishers, New Delhi, 2010.

[5] Sabapathy, S. Raja M. Ch.; Shanmugakrishnan, R. Raja D. N. B.; Ramkumar, Sanjai D. N. B.; Muthukumar, Vamseedharan M. Ch.; Senthilkumaran, M. M. Ch.; Bharathi, R. Ravindra M. Ch. . Postburn Reconstruction of the Face and Neck. Plastic and Reconstructive Surgery 150 (6): p 1326e - 1339e, December 2022. | DOI: 10.1097/PRS.0000000000009690