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ORIGINAL ARTICLE

Audit of head and neck defect reconstruction.

Mansoor Khan[1], Waqas Hayat[2], Hidayat Ullah[3]

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ABSTRACT… Objective: To share our experience with reconstruction of the head and neck defects and to standardize the reconstruction options for such defects. **Study Design:** Descriptive Cross Sectional study. **Setting:** Burns and Plastic Surgery Center, Peshawar. **Period:** November 2018 to December 2022. **Material & Methods:** Data was collected from medical records about the patient demographics, mechanism of injury and type of procedures done. Defect size was classified into small (< 3 cm), medium (4 cm to 8 cm) and large (> 8 cm). Data was analyzed using SPSS. **Results:** Over the study period, 112 (70%) male and 48 (30%) female patients, with mean age of 44.36 + 21.35, were operated. The main cause of head and neck defects, were malignant lesions; 60% (n=96) cases. The most common site of was nose, either alone or in combination with surrounding areas. In 54 (33.4%) cases, the reconstructed defects were of medium size, followed by large defects (n=52, 32.5%). In 79 (49.4%) cases, the defects were reconstructed with local flaps, followed by pedicled flaps; 70 (43.8%) cases. Free flap reconstruction was performed in 11 (6.9%) cases. The most common free flap was fibula based (n=4). Complications were observed in 4.4% cases. **Conclusion:** The most common defects in head and neck region are on nose. In most cases the etiology is lesion excision. Other common defects encountered are scalp, eyelids and ear. Most of the defects can be covered with local flaps with very low complication rate.

Key words: Head and Neck, Head and Neck Cancers, Plastic Surgery Procedures, Reconstruction, Trauma.

INTRODUCTION

Head and neck region contributes to the personality of a person. It gives identity to an individual. When there is a defect in the head and neck area, the reconstruction is not only aimed at correcting the apparent defect but also at restoring the identity and confidence of the patient. Defects in these regions can have significantly negative consequences on the confidence of the patient and can lead to psychological issues.[1] This in turn decreases quality of life and social presence of the patient.[2,3]

Most common causes for head and neck defects that are reported in literature and require reconstruction are trauma and tumors in this region.[4-8] Most common causes of head and neck trauma are shrapnel, gun shot and motor vehicle injuries. A study in the US looked at cases of head and neck trauma across the US. One third of all head and neck trauma patients required reconstruction of the defect. While patients presenting with traumatic injuries are relatively young, the demographic for head and neck tumors is relatively older population.[7,9,10]

Reconstruction of head and neck defects is a very important area for surgeons. Standardization of reconstruction options for such defects is necessary to further the research in this area and to conduct outcome based studies on different reconstruction options. The aim of this study is to share our experience with reconstruction of the head and neck defects and to standardize the reconstruction options for such defects.

MATERIAL & METHODS

This Descriptive Cross sectional study was conducted from November 2018 to December 2022 in Burns and Plastic Surgery Center,

1. MBBS, FCPS (Plastic Surgery), Assistant Professor, Burns and Plastic Surgery Center, Peshawar.
2. MBBS, FCPS (Plastic Surgery), Assistant Professor, Burns and Plastic Surgery Center, Peshawar.
3. MBBS, FCPS (Plastic Surgery), Assistant Professor, Burns and Plastic Surgery Center, Peshawar.

Correspondence Address:
Dr. Waqas Hayat
Burns and Plastic Surgery Center, Peshawar.
waqashayat218@yahoo.com

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Peshawar. The sampling technique adopted was Convenient non-probability sampling.

After approval from the Institutional review and ethical board (IREB) (21/REB/B&PSC/22), data was collected from patient records from the hospital records. Data regarding etiology, defect size, and reconstruction was collected in the excel sheet. Flaps used to reconstruct the defects were also documented. Data was pruned in SPSS and descriptive statistics were done. Mean and standard deviations were calculated for patient age and defect sizes. Percentages were calculated for different flaps sued in the reconstruction. Cases were further divided region wise and according to the size of the defect. Cases were classified into the small (<3cm), medium (4-8cm) and large (>8cm) defects. The region and size of the defect were cross tabulated with the flap used for reconstruction in order to make the algorithm for reconstructive options in the head and neck area. Complications were classified into insignificant and significant complications. Insignificant complications are those that were managed conservatively. Significant complications are those that require take back to the operating room or a secondary procedure.

RESULTS

Over the study period, 112 (70%) male and 48 (30%) female patients were operated for head and neck reconstruction. The age of the patients ranged from one month to 90 years with a mean of 44.36 + 21.35 SD. The main cause of head and neck defects, presented for reconstruction were malignant lesions, accounting for 60% (n=96) cases. The most common site of surgical defects was nose, either alone or in combination with surrounding structures (Table-I).

In 54 (33.4%) cases, the reconstructed defects were of medium size, followed by large defects (n=52, 32.5%). In 6 (3.8 %) cases, the reconstruction was performed for functional improvement of the face. Seventy one (44.4%) cases presented with right side of the head and neck defects. In 79 (49.4%) cases, the defects were reconstructed with local flaps, followed by pedicled flaps in 70 (43.8%) cases (Figure-1). Free microvascular flap reconstruction was performed in 11 (6.9%) cases. The most common flap performed was forehead flap (n=28) (Figure-1 & 2), followed by scalp flap in 16 cases (Figure-4). The most common free flap was fibula based (n=4) followed by RFF (n=3). Most of the cases (n=128) were performed in single stage, while in 31 cases the reconstructive procedure was completed in 31 cases.

Complications were observed in 4.4% cases. The most common complication was flap congestion (1.9%) followed by flap necrosis in 1.3% cases. All the cases of flap necrosis were insignificant partial flap necrosis which did not require any secondary reconstructive procedure.

Site of Surgical Defects	Frequency (%)
Nose	31 (19.4%)
Ear Lobe	10 (6.3%)
Upper Lid	3 (1.9%)
Lower Lid	8 (5.0%)
Medial Canthal	4 (2.5%)
Lateral Canthal	1 (0.6%)
Orbital Defect	1 (0.6%)
Palate	1 (0.6%)
Medial Cheek	4 (2.5%)
Lateral cheek	6 (3.8%)
Centeral cheek	5 (3.1%)
Ear	9 (5.6%)
Mandible	4 2.5%)
Lids/Temporal	1 (0.6%)
Oral Cavity	4 (2.5%)
Neck	3 (1.9%)
Lower Face	2 (1.3%)
Nose/Upper Lip/Cheek	2 (1.3%)
Middle/Lateral Cheek	4 (2.5%)
Nose/Medial Cheek	2 (1.3%)
Scalp	13 (8.1%)
Scalp/Neck	2 (1.3%)
Lower Lid/ Cheek	2 (1.3%)
Orbit/Cheek	2 (1.3%)
Temple/cheek	1 (0.6%)
Nose/Upper lip	2 (1.3%)
Postauricular	1 (0.6%)
Nose/Upper Lip/ Palate/Maxilla	1 (0.6%)
Upper & Lower Lip	1 (0.6%)
Lateral Cheek / Forehead	1 (0.6%)
Orbit / Cheek / Nose	1 (0.6%)
Upper Lip	4 (2.5)
Lids/Periorbital	1 (0.6%)
Oral cavity/ Cheek	1 (0.6%)
Scalp/Forehead	1 (0.6%)
Lower Lip	7 (4.4%)
Oral Commissure	4 (2.5%)
Forehead	7 (4.4%)
Temple	3 (1.9%)
Total	160 (100.0%)

Table-I. Surgical defect site in the study population

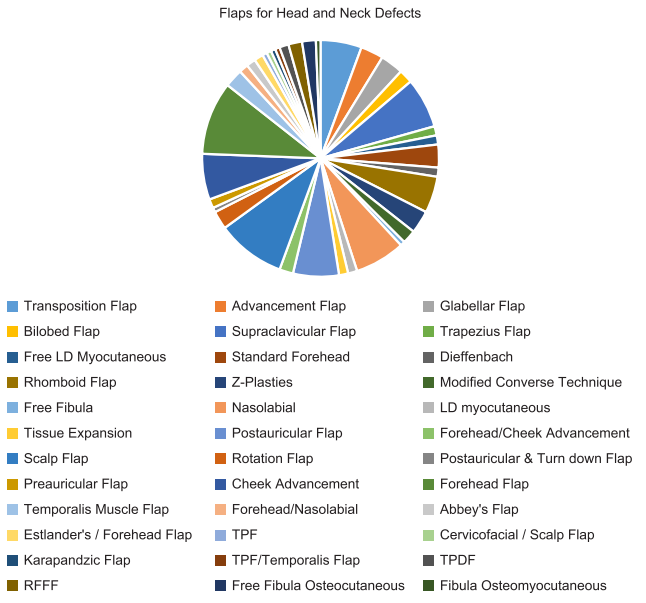

Figure-1. Types of flaps performed in the study population

Figure-2. Patient had history of firearm injury. Scar was released. Forehead flap done for nasal reconstruction.

Figure-3. Basal cell carcinoma excision done involving both eyelids and temple area. Image shows defect created after excision of the lesion. Reconstruction done with standard forehead flap.

Figure-4. Squamous cell carcinoma in occipital area. Scalp rotation flap done to cover the defect. Donor area was covered with a split thickness skin graft.

DISCUSSION

Head and neck reconstruction is a problem which involve people of all age groups. In younger patients, the patients require reconstruction mostly due to trauma. In the older age group, malignancies are more prevalent and are the main cause of head and neck reconstruction.[4,11] Average age in our study is 44.36 years. Age has a bimodal distribution, the younger peak for mostly trauma cases and the older pea for patients who undergo reconstruction due to malignancy.

Defects involving nose were the most common defects. Forehead flap was done for reconstruction of nasal defects. Brodland et al. used forehead flap for nasal reconstruction.[12] As it is a very old flap, its anatomy is well described and is easy to raise.[13] Rib cartilage can be harvested for nasal reconstruction for patients with loss of cartilage or saddling of the nose.[14] Good aesthetic outcomes can be achieved by carefully designing and debulking the flap.[15,16] Another option for alar defects is the nasolabial flap. If done properly, the scar hides in the nasolabial fold. The ideal reconstruction entails that the reconstruction should follow anatomical subunits to be aesthetically pleasing.[17,18] If a partial sub-unit is reconstructed, then the scar will be visible to the naked eye.[19]

Scalp defects can occur due to trauma, benign lesions and malignant lesions.[20] Defects due to benign lesions are usually closed primarily and do not require any further treatment.[21] Defects due to trauma or malignant lesions usually require a scalp flap. If the defect is too large, a free tissue transfer like latissimus dorsi flap is done to cover the defect.[22,23]

Other common defects in head and neck areas include reconstruction of the eyelids and ear reconstruction. Eyelids serve important function of protecting the globe. Upper eyelid reconstruction is more challenging as compared to the lower eyelid reconstruction as it should not only protect the globe but also maintain a good field of vision by not producing ptosis. Small defects are covered by local tissue advancement. Forehead flap along with tarsoconjunctival flap is sued to cover larger defects. If tarsoconjuctival flap is not available, periosteum can be harvested along with the forehead flap for providing the inner lining. Lower eyelid is reconstructed b cheek advancement in case of large defects.

As this study presents all head and neck reconstruction cases, a detailed discussion on any single defect is out of scope of this paper. Data was obtained from patient records. Due to retrospective nature of this study, some variables could not be retrieved reliably for all cases and could not be analyzed.

Head and neck area reconstruction encompasses large number of defects. Although the etiology can vary but the reconstruction options remain the same. Further work needs to be done on compiling head and neck reconstruction for didactic purposes and for standardization of treatment options.

CONCLUSION

The most common defects in head and neck region are on nose. In most cases the etiology is lesion excision. Other common defects encountered are scalp, eyelids and ear. Most of the defects can be covered with local flaps with very low complication rate.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Mansoor Khan	Conception, design, Data collection, Writing analysis, Responsibility for content of this article.	
2	Waqas Hayat	Conception, design, writing analysis, responsibility for content of this article.	
3	Hidayat Ullah	Conception, design, data collection.