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ORIGINAL ARTICLE

LOCAL AND LOCOREGIONAL FLAPS IN HEAD AND NECK DEFECTS

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ABSTRACT: BACKGROUND: Local and locoregional flaps are very useful in reconstruction of head and neck defects. Each case should be judged on its merits and selection of flap (local or locoregional) should be done by considering various factors. **AIM:** To study the etiological factors, type, distribution, management of head and neck defects (post traumatic, post malignancy & congenital) by using local and locoregional flaps and the overall cosmetic effect and function of both donor as well as recipient sites. **MATERIAL AND METHODS:** 40 patients were studied in a multispecialty hospital admitted in the trauma unit or as OPD patients. After stabilization, especially in trauma patients, patients were fully investigated and treatment protocol was made and reconstruction was done as per protocol. **RESULTS:** In this study, the mean age of patients was 29.8 years. The main cause of head and neck defects was post traumatic (58%) followed by malignancy (23%), infections (10%) and others (9 %). The mean age for post traumatic defects was 26.42 years. In post malignant defects, Basal cell carcinoma was the major cause of defect (50%) followed by oral malignancy (54%). All the patients with oral carcinoma were tobacco chewers and 50 % were alcoholic. Middle third of face (67%) was most common site for defect followed by scalp (14%), upper third (7%) and lower third face (6%). In the middle third of face, nose (38%) was commonest site of defects followed by cheek (34%) and ears (28%). Local flaps were used in 38% of defects as compared to locoregional flaps (62%). Advancement flaps were mainly done for cheek defects (70%). Rotation and transposition flaps were done mainly for scalp defects. Most common locoregional flap done was median forehead flap (27%) followed by deltopectoral flap. **CONCLUSION:** Local and locoregional flaps are still very useful in reconstruction of head and neck defects. This is in accordance with Gille's rules of reconstruction i.e." like replaces like". Treatment of the head and neck defects should be individualized. Each case should be judged on its merits and selection of flaps (local or locoregional) should be done by considering various factors like type of defect, site of defect, amount of associated injuries, and the condition of adjacent skin.

KEYWORDS: Flap, defects, reconstruction.

INTRODUCTION: Extensive tissue defects in head and neck are a challenge for reconstructive surgery. The goals and principles for reconstruction of these tissue defects, created by various etiologies, remains the same.(1) The management of the defect depends upon the size of the defect, location of the defect, comorbid conditions of the patient and the type of defect i.e. whether traumatic or post malignancy. Today, the goal of modern head and neck reconstruction is a cosmetically appealing outcome that results in normal motor and facial function and patient satisfaction.(2)

A flap is a tissue transferred from one part of body to another with its blood supply intact. Skin grafts transplant the epidermis, but flaps are more complex and contain epithelial tissue, dermal elements, subcutaneous tissues, and accompanying blood supply. Flaps are categorized based on the vascular system unique to that flap, and whether the vessels are intact or are transacted and re

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anastomosed with microsurgical techniques.[3] Flaps were first categorized as random or axial by McGregor and Morgan in 1973. Random flaps derive their blood supply from the dermal-sub dermal plexus of skin. Axial flaps have an arterial and venous blood supply along the long axis of the flap.

The reconstructive pyramid has been touted as the best approach to these kind of defects. In this pyramid, the reconstruction options begins with local tissue and progress to regional tissue reconstructions, and finally to free tissue transfer. Local tissues are mainly used for smaller defects.

The use of local tissue can be increased with the utilization of tissue expanders. This skin is typically of the ideal character, thickness, and color for the associated defect. The free tissue transfer has allowed the surgeon the options of tissue of different size, character, components and function. Appropriate tissue can be transferred without the limitations of flap size, geometry, or pedicle length. It is often advantageous to use a subunit approach to this complex reconstruction.

AIM: The present study was done to find out the etiological factors, type and distribution, management of head and neck defects (post traumatic, post malignancy & congenital) by using local and locoregional flaps and the overall cosmetic effect and function of both donor as well as recipient sites.

MATERIAL AND METHODS: 40 patients (n=40) were studied in a multispeciality hospital admitted in the trauma unit or as OPD patients. After stabilization especially in trauma patients, patients were fully investigated and treatment protocol was made and reconstruction was done as per protocol. Sometimes, multiple surgeries were required. Patients were followed up regularly after discharge to monitor the outcome of treatment modality, to assess complications emanating in the process of care.

RESULTS: In this study, the mean age of patients was 29.8 years and 79% of the subjects belonged to age group of 10- 40 years. The main cause of head and neck defects was post traumatic (58%) followed by malignancy (23%), infective (10%) and others (9%). The mean age for post traumatic defects was 26.42 years. In post malignant defects, Basal cell carcinoma was the major cause of defect (50%) followed by oral malignancy (54%), others were neurofibroma (8%) and hairy nevus (8%) etc. All the patients with oral carcinoma were tobacco chewers and 50 % were alcoholic. Middle third of face (67%) was most common site for defect followed by scalp (14%), upper third (7%) and lower third face (6%). In the middle third of face, nose (38%) was commonest site of defects followed by cheek (34%) and ears (28%). Nasal defects were present mainly in subunit 2 & 3 of nose. Cheek defects were present in zone 1 & 2 (aesthetical units by Gonzalez-Ulloa et al). In the scalp, temporoparietal region (67%) was most commonly involved.

In the study, various types of flaps ranging from fasciocutaneous flaps, fascial flaps, muscle flaps and musculocutaneous flaps. Local flaps were used in 38% of defects as compared to locoregional flaps (62%). Local flap ranged from transposition flap, rotation flap and advancement flap. Advancement flaps were mainly done for cheek defects (70%). Rotation and transposition flaps were done mainly for scalp defects. Various locoregional flaps like deltopectoral flap, PMMC flap, median forehead flap, nasolabial flap, forehead flap, temporalis muscle flap, TP fascial flap etc were used for reconstruction of defects. Most common locoregioonal flap done was median forehead flap (27%) followed by deltopectoral flap.

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DISCUSSION: In the present study, posttraumatic head and neck defects accounts for 79% of cases in age group of 10-40 years. Mean age in posttraumatic head and neck defects was 26.42 years. This is in accordance with results observed by Patrick Cole et al,[4] Murray dJ et al[5] and Turvey TA.[6] This age group is more exposed to risks like accidents while driving, working outdoor, drinking brawls, tobacco, gutka etc. Children are at less risk due to parental protection and anatomically also, children are less prone to developing fractures as they have low ratio of facial mass to cranium.

In the study, 75% of the patients in post malignant head and neck defects were more than 30 years of age. According to WHO, carcinoma of oral cavity in males in developing countries, is the sixth commonest cancer, while in females, it is the tenth commonest site of cancer. Mean age in oral malignancy head and neck defects was 48 years. The mean age of oral malignancy was 58 years in the study by Bianchi b[7] and 57 years in the study by Austin IM. All the patients with oral carcinoma were tobacco chewers and 50% were alcoholics. Studies by Mehrotra R[8] has shown that tobacco and alcohol are the two most important risk factors for the development of oral carcinoma. 47 % of the patients had associated injuries. Head injuries were seen in 16%, chest and abdomen injuries alone seen in 5%, limb injuries in 11% and multiple injuries in 16%. Steidler N E et al[9] noted head (51%), chest (12%), and abdominal injury(5%) concomitant with facial injuries.

In the study, 67% of the defects were present in the middle third of face followed by 14% of scalp defects. Most of the nasal defects were posttraumatic and post malignancy. They were present mainly in the subunit 2 & 3 of nose. Cheek defects were present mainly in the zone 1 & 2(aesthetical unit by Gonzalea – Ulloa et al). Rashid M et al[10] has shown in his study that zone 1 in cheek is a common site of post traumatic and post tumor resection defects.

Local flaps were done in 38% of cases and locoregional flaps were done in 62% of cases. Local flaps ranged from transposition flap, rotation flaps and advancement flap. All the flaps were fasciocutaneous flaps. Transposition flaps and rotation flaps were done mainly for scalp defects. In transposition flaps, the donor site was grafted and in rotation flaps, donor site was closed primarily. Tamas et al[11] have shown that the size and shape of a scalp defects decides the type of reconstruction flap. In this study, advancement flap were done in mainly cheek defects (71%). Rashid M et al[10] has shown that cheek flaps are reliable, quick to execute, and capable of covering large defects. It provide skin of excellent colour and texture, and most of the scars are hidden in natural skin folds.

Various locoregional flaps like deltopectoral flap, PMMC flap, median forehead flap, nasolabial flap, forehead flap, temporalis muscle flap, TP fascial flap etc were used for reconstruction of defects. Most common locoregioonal flap done was median forehead flap (27%) followed by deltopectoral flap. Median forehead flap is an axial pattern flap and is very useful for repair of nasal defects. Near normal functional and cosmetic results can be achieved. Boyd et al[12] concluded in their study that median forehead flap are one of the best methods for repair of extensive nasal defects. Rotunda AM et al[13] in their study also concluded that nose is one of the most challenging anatomical facial areas for the reconstructive surgeon to achieve an optimal, esthetic, and functional results. Deltopectoral flap is very suitable for covering of head and neck defects due to similar colour and texture of skin. Also, deltopectoral flap on the anterior surface of shoulder do not interfere with function of shoulder and also hidden donor site do not cause any serious cosmetic problem. Bakamjian V Y et al[14] compared deltopectoral flap with cervical, forehead, temporal and other flaps and concluded that deltopectoral flap is very suitable for covering head and neck defects. Eric Bey et al[15] also showed that

deltopectoral flap provides a suitable coverage for head and neck skin defects, especially for the treatment of burn complications of the neck. Nasolabial flap are the ideal source was nasal reconstruction. Donor site can be placed along nasolabial fold and the flap can be used for outer or inner lining of nasal defects. Hagerty et al[16] showed that nasolabial and cheek flaps are ideal sources for partial nasal reconstruction. PMMF is a reliable and versatile flap for reconstruction of head and neck defects because it can be used for both mucosal and skin lining of defect and low incidence of donor site complications. Advantage of PMMF flap is one stage reconstruction, no change of patient's position and dual lining. Disadvantage of PMMF is breast asymmetry in females. Milenovic A et al[17] showed in his study that pectoralis major flap is reliable and versatile for reconstruction in the head and neck area. Incidence of donor site complications in their study was 4%. Temporalis muscle flap is very useful for reconstruction of head and neck defects. Only disadvantage of the flap is that it produces hollowness at donor site. Hanasono M M et al[18] showed that compared with other regional flaps, the muscle flap is associated with low donor site aesthetic and functional morbidity and offer great flexibility in reconstruction. Cervical tube flap can be used for reconstruction of helical rim of ear both functionally and cosmetically without any donor site complication. White K S et al[19] showed in his study that before the advent of axial pattern flaps and free tissue transfer, tube pedicle flaps were the workhorses of the reconstructive surgeons.

CONCLUSION: Local and locoregional flaps are still very useful in reconstruction of head and neck defects. This is in accordance with Gille's rules of reconstruction i.e. like replaces like. Treatment of the head and neck defects should br individualized. Each case should be judged on its merits and selection of flaps (local or locoregional) should be done by considering various factors like type of defect, site of defect, amount of associated injuries, and the condition of adjacent skin.

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