Original Article

Use of Supraclavicular Artery Flap in Head and Neck Reconstruction

Ijaz Hussain Shah, Muhammad Bilal Saeed, Naheed Ahmed

ABSTRACT

Objective: To evaluate the use of supraclavicular artery flap in head and neck reconstruction in terms of its reliability, clinical applications, and functional & aesthetic outcome.

Study Design: Descriptive study

Place and Duration of Study: This study was conducted at the PIBC, Nishtar Medical University, Multan.It was completed in 18 months from June 2016 to Dec 2017.

Materials and Methods: This study included 30 patients requiring soft tissue reconstruction in the head and neck region. Survival of supraclavicular artery flap, functional & aesthetic outcome, and donor site appearance were studied.

Results: All flaps survived except for a distal 10 % necrosis seen in two cases. The functional and aesthetic outcomes were excellent with an acceptable donor site appearance. The areas reconstructed included neck, chin, cheek, jawline.

Conclusion: The ideal flap to resurface head and neck defects has yet to be found. In our experience, the supraclavicular artery flap is one of the reconstructive techniques of choice for medium to large defects of the head and neck region. It is a reliable, thin and pliant fasciocutaneous flap, and expands significantly postoperatively.

Key Words: Supraclavicular artery flap, Head and neck reconstruction, Fasciocutaneous flap, thin and pliable flap, close match.

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INTRODUCTION

Restoration of both form and function in the head and neck region remains a challenge for the plastic and reconstructive surgeons. This challenge comes from the visibility of the head and neck during social contact. A soft tissue defect in this region can lead to loss of both structure as well as function and can render the appearance of an individual socially unacceptable.

Defects in this region arise mainly from trauma, tumours, congenital anomalies, burns[1]and infections.

The ideal flap for the head and neck reconstruction should be thin and pliable with a good colour and texture match. Moreover, the donor-site morbidity should be minimal with no resulting functional or aesthetic impairment.[2]

A number of reconstructive options are available depending on the size and complexity of the defect. These includeskin grafts,[3] local flaps,[4]pedicled fasciocutaneous,[5] and musle[6] or myocutaneous flaps,[7]tissue expansion techniques[8] and free tissue transfer.[9]

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Vacuum-assisted closure (VAC) has also been reported as a safe and useful reconstructive tool for complex defects of the head and neck region.[10] Each option has got its own merits and demerits. The skin graft has the obvious disadvantages of colour mismatch and postoperative graft contracture.[11] Tissue expansion methods[8]produce enough like tissue with good color and texture match but they require multiple operations, have high rate of complications and are more expensive. Free tissue transfer is an attractive option and when used as a super thin flap does provide excellent texture match. However the colour match is suboptimal and it also requires long operating time and is equipment and skill dependant.[2]

As a basic concept, first formulated by Gillies in 1920, the more adjacent the donor site is, the better the skin will match the recipient.[12] The head and neck region itself suffers from a lack of local tissues available for reconstruction. The areas which are adjacent to the head and neck are chest and shoulder.

The supraclavicular and shoulder areas can provide skin which fulfils most of the criteria of an 'ideal flap' for this region. The flap raised from this area, known as supraclavicular artery flap, is an extremely reliable, local, pedicledfasciocutaneous flap. It is based on the supraclavicular artery, which is a branch of the transverse cervical artery, or, less frequently, of the suprascapular artery.Its skin paddle consists of a defined region around the shoulder cap. It offers thin and pliable skin with good colour and texture match and minimal donor site morbidity. The purpose of this

study was to evaluate the role of supraclavicular artery flap in head and neck reconstruction in terms of its reliability, clinical applications, and functional and aesthetic outcome.

MATERIALS AND METHODS

It was a Descriptive study. A total number of thirty patients with lesions in head & neck region and requiring flap reconstruction were included in this study. It was convenience sampling. The collected data was analyzed by SPSS statistical package version 20. Following variables were studied:

1. Flap survival (percentage)
2. Functional restoration at one, three and six months follow-up
3. Aesthetic restoration at one, three and six months follow-up

RESULTS

A total number of 30 patients were included in this study. All of them were studied during the one and half year of this study. There were 13 (43.3%) male and 17 (56.7%) female patients, as shown in table 1. In 28 (93.3%) patients, flap survival was noted to be 100 percent. In only 2 (6.7%) patients, it was found to be 90 percent, as the distal 10% of the flap underwent necrosis as shown in Table 2.

At one month follow-up, the functional restoration was noted to be excellent in 6 (20%) patients, good in 21 (70%) patients, and satisfactory in 3 (10%) patients. None of the patients (0%) at one month follow-up was found to have a poor functional restoration.The functional restoration kept on improving with the passage of time. At three months follow-up, it became excellent in 16 (53.3%) patients, good in 12 (40%) patients and remained satisfactory in 2 (6.6%) patients. Not a single patient (0%) was found to have a poor functional restoration at this stage.At six months follow-up, still further improvement was seen in the functional restoration. It became excellent in 22 (73.3%) patients, good in 6 (20%) patients, and remained satisfactory in 2 (6.7%) patients. Again none of the patients (0%) was found to have a poor functional restoration at this stage of follow-up, as shown in table 3.

Table No.1: Distribution of Cases by Sex

Sex	Frequency (%)
Male	13 (43.3)
Female	17 (56.7)
Total	30 (100.0)

n=30

Table No. 2. Distribution of Cases by Flap Survival

Flap Survival (%)	Frequency (%)
100	28 (93.3)
90	2 (6.7)
Total	30

n=30

Table No.3: Distribution of Cases by Functional Restoration at 1, 3 and 6 Months Follow-up

Functional Restoration	Frequency (%)		
	At 1 month follow-up	At 3 months follow-up	At 6 months follow-up
Excellent	6 (20.0)	16 (53.0)	22 (73.3)
Good	21 (70.0)	12 (40.0)	6 (20.0)
Satisfactory	3 (10.0)	2 (6.7)	2 (6.7)
Poor	0 (00.0)	0 (00.0)	0 (00.0)
Total	30 (100.0)	30 (100.0)	30 (100.0)

n=30

Table No.4: Distribution of Cases by Aesthetic Restoration at 1, 3 and 6 Months Follow-up

Aesthetic Restoration	Frequency (%)		
	At 1 month follow-up	At 3 months follow-up	At 6 months follow-up
Excellent	11 (36.7)	17 (56.7)	21 (70.0)
Good	13 (43.3)	9 (30.0)	5 (16.7)
Satisfactory	6 (20.0)	4 (13.3)	4 (13.3)
Poor	0 (00.0)	0 (00.0)	0 (00.0)
Total	30 (100.0)	30 (100.0)	30 (100.0)

Figure No.1: Postburn neck contracture (front view)

Figure No.2: Postburn neck contracture (lateral view)

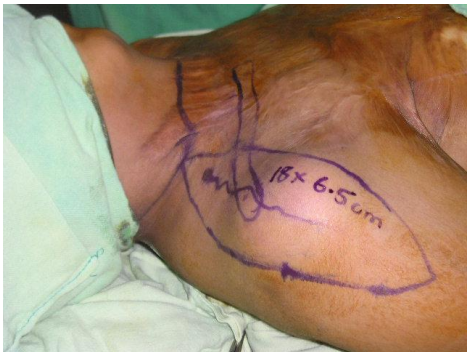

Figure No.3: Flap markings for right supraclavicular artery flap.

Figure No.4: Flap transferred to the defect.

Figure No.5: Early Post operative view

At one month follow-up, the aesthetic restoration was noted to be excellent in 11 (36.7%) patients, good in 13 (43.3%) and satisfactory in 6 (20%) patients. No patient (0%) had a poor aesthetic outcome.Like the functional restoration, the aesthetic restoration was also seen to be improving with the passage of time. At 3 months, it became excellent in 17 (46.7%) patients, good in 9 (30%) patients and remained satisfactory in 4 (13.3%) patients. None of the patients (0%) had a poor aesthetic outcome at this follow-up.At 6 months follow-up, still further improvement was noted in the aesthetic restoration. It became excellent in 21 (70%) patients, good in 5 (16.7%) patients and remained satisfactory in 4 (13.3%) patients. Again none of the patients (0%) was seen to have a poor aesthetic outcome at this stage of follow up, as shown in table 4.

Figure No.6: Tumour of cheeck

Figure No.7: Supraclavicular artery flap attached.

Figure No.8: After flap division.

DISCUSSION

Reconstructive procedures in the head and neck region have to take account of anatomic, aesthetic and functional aspects. First, normal contours have to be achieved; in the neck, the cervico-mandibular angle has to be reformed. Second, the aesthetic units have to be taken into account. Third, the functional outcome has to ensure full range of movements, both of the lower face and neck. Finally, additional scarring of the upper chest should be avoided. To achieve these goals, a thin reliable flap, harvested close to the face/neck region with good colour and texture match, and a smooth hairless skin surface is needed. Everyday clothing should conceal the donor site.

So for thin, flexible and smooth hairless resurfacing with acceptable donor site camouflage, supraclavicular artery flap which is raised from region of shoulder seems to be the best choice. It can provide skin which fulfils most of the criteria of an ideal flap for this region.

Lamberty was the first to describe a supraclavicular artery based flap in 1979.[16]Pallua modified it as an island flap to increase its versatility and to minimise dog ears and scars in the supraclavicular region.[13]

In our series of 30 patients, the most common site requiring reconstruction was the neck region (n=21). The next most common site was the cheek (n=5). The other sites reconstructed included chin (n=1), oral cavity (n=1), jawline (n=1), and hypopharnx and cervical oesopahus (n=1). Pallua and Noah,[13] and Di Benedetto et al.[14] have used this flap for almost similar type of defect locations. In addition, the latter group has reported the use of this flap for chest wall reconstruction as well.

All flaps used in our study survived. In 28 (93.3%) patients, the flap survival was complete (without any necrosis). In only 2 (6.7%) patients, tip necrosis (distal 10% loss) was seen. In one of them, the cause of this tip necrosis was found to be haematoma formation under the distal area of the flap despite the placement of a suction drain which probably blocked by clotted blood. The haematoma was drained, necrosed part was debrided and the resulting raw area was covered by advancement of the flap. In the other patient, it was probably too much tension across the distal edges of the flap which led to tip necrosis. The necrosed area was debrided and the resulting defect was closed primarily by advancing the flap. Pallua and Noah,[13] Di Benedetto et al.,[14] Rashid et al.[2] have reported almost similar results about the supraclavicular artery flap survival in their series of 28, 27, 25 and 30 patients respectively.

Each patient was followed up for a period of at least six months. Chaudhry et al.[15] have also presented their results after a follow-up of six months.

Functional and aesthetic restorations were recorded at one, three and six months follow up. With the passage of time, a progressive improvement in the range of motion in reconstructed areas like neck, cheek, chin and oral cavity was observed. At one month follow-up, the functional restoration was noted to be excellent in 6 (20%) patients, good in 21 (70%) patients, and satisfactory in 3 (10%) patients. None of the patients (0%) at one month follow-up was found to have a poor functional restoration. At three months follow-up, it became excellent in 16 (53.3%) patients, good in 12 (40 %) patients and remained satisfactory in 2 (6.6%) patients. Not a single patient (0%) was found to have a poor functional restoration at this stage. At six months follow up, 22 (73.3%) patients had excellent, 6 (20%) patients had good while 2 (6.7%) patients had satisfactory functional restoration. None of the patients (0%) had poor functional outcome. This significant improvement in function was mainly due to postoperative expansion of the flap These results are comparable to those reported by Rashid et al.[2] They used Watusi splint in all of their cases for postoperative stretching of the flap. They followed-up their patients at 3, 6 and 12 months, measured the width of the flap at each follow-up and found an average of 63% increase in width at one year.

Just like the gradual improvement seen in function, the aesthetic appearance also kept on improving with the passage of time. At one month follow-up, the aesthetic restoration was noted to be excellent in 11 (36.7%) patients, good in 13 (43.3%) and satisfactory in 6 (20%) patients. No patient (0%) had a poor aesthetic outcome. At three months follow-up, it became excellent in 17 (46.7%) patients, good in 9 (30%) patients and remained satisfactory in 4 (13.3%) patients. None of the patients (0%) had a poor aesthetic outcome at this follow-up. At six months follow-up, excellent aesthetic restoration was seen in 21 (70%) patients, good in 5 (16.7%) patients and remained satisfactory in the remaining 4 (13.3%) patients. None of the patients (0%) had a poor aesthetic outcome. These results are comparable to those reported by Di Benedetto et al.[14] and Chaudhry et al.[15]

CONCLUSION

The ideal flap to resurface head and neck defects has yet to be found. In our experience, the supraclavicular artery flap is one of the reconstructive techniques of choice for medium to large defects of the head and neck region. It is a reliable, thin and pliant fasciocutaneous flap, and expands significantly postoperatively.

Author's Contribution:

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

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Original Article

Eosinophilia in COPD

Frequency of Blood Eosinophilia in Patients of COPD Exacerbations

Huma Batool[1], Noor ul-Arfeen[2] and Muhammad Hussain[3]

ABSTRACT

Objective: To determine frequency of blood eosinophilia in patients with COPD exacerbation

Study Design: *Cross-sectional Study*

Place and Duration of Study: This study was conducted at the Department of Pulmonology, Services Hospital Lahore from 01-02-2017 to 31-07-2017.

Material and Methods: 150 patients fulfilling inclusion criteria for all types of COPD with acute exacerbations before treatment were included in study from outdoor and indoor of pulmonology department of Services Hospital, Lahore. Informed consent was taken. The data was collected through a predesigned proforma. Bias effect was controlled by having eosinophil count measured from single laboratory of Services hospital by digital method followed by manual verification for those having >2% eosinophilia. All the information was written in pre-designed proforma.

Results: Out of 150 cases 90 % (n=135) were males and only 10% (n=15) were females. Mean age of presentation was 60.27±9.7.42% (n=63) patients were found to be having raised peripheral blood eosinophilia while 58% (n=87) patients had normal eosinophil count.Male to female ratio was 9:1

Conclusion: Peripheral blood eosinophilia is a significant biomarker in patients with acute exacerbation of COPD for our population.

Key Words: COPD,Acute exacerbation of COPD, Peripheral blood eosinophilia, airway eosinophilia.

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INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a preventable and treatable disease with some significant extrapulmonary effects that may contribute to the severity in individual patients. Its pulmonary component is characterized by airflow limitation that is not fully reversible. The airflow limitation is usually progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases.[1]

Chronic obstructive pulmonary disease (COPD) has an extensive, adverse effect on both patients and the healthcare system. It is the fourth-ranked cause of death in the United States, killing more than 120,000 individuals each year.[2]

The diagnosis of COPD required pulmonary function tests (PFTs) in symptomatic patients with history of exposure to tobacco smoke, occupational dust, or occupational chemicals[3]. COPD is confirmed when a patient who has symptoms that are compatible with COPD is found to have airflow obstruction (ie, a forced expiratory volume in one second [FEV1]/forced vital capacity [FVC] ratio less than 0.70) and there is no alternative explanation for the symptoms and airflow obstruction.Any exacerbation of COPD is an acute event which is characterized by worsening of the patient's respiratory symptoms (shortness of breath, increase in sputum productionand change in sputum colour) that is beyond normal day to day variation and leads to a change in medications[4].

Current guidelines advocate use of systemic steroids in acute exacerbation of COPD but the treatment responses are heterogeneous, efficacy is marginal and treatment is not without side effects[8]. Airway eosinophilia is associated with corticosteroids responsiveness in COPD and peripheral blood eosinophil count is a sensitive and specific biomarker for airway eosinophilia during exacerbation of COPD[9.]

Empirical antibiotics and systemic steroids for 7-10 days are usually prescribed for the treatment of exacerbation according to GOLD guideline for COPD. A biomarker directed treatment strategy using the peripheral blood eosinophil count to guide corticosteroid prescription can be used to treat exacerbation of COPD. Peripheral blood eosinophils are a highly sensitive and specific marker of sputum eosinophilia during exacerbation of COPD[11] as COPD patients with eosinophilia respond better to

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