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Original Research Article

Supraclavicular Artery Flap for Resurfacing of Neck, Head, and Upper-Thoracic Defects

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Abstract:

Background: The region of head and neck is a delicately challenging part to resurface because it is a highly visible area of our body. Hence, in order to achieve best results distant flaps or free flaps are used in the defects of the tissue area. As of the study using supraclavicular artery flap for resurfacing the head, neck and upper torso constitute an adaptable choice.

Materials and Methods: In this study, flaps have been used in neck injuries which were a result of after burn hardening of muscles. Although its application may be alike in other conditions also. A total of 18 supraclavicular flaps were reported on 14 patients for many defects in the head and neck area.

Results: All the flaps sustained entirely and the post- operative morbidity was considerably low excepting the one flap.

Conclusion: "The supraclavicular artery flap" supplies a natural colour and texture matching and also it supports the multi-dimensional movement of the neck.

Keywords: Pectoralis Major Flaps, Sterna Dehiscence, Surgical Flaps.

Introduction

It is considered a challenge to reconstruct the region of head and neck when there's a defect [1]. This may be due to high complexity of the position and function of the two regions and also the level of visibility plays an important role in giving a best result by the surgeon [2].

Muscle contractures are the result of deep thermal injury which can endure the victim socially and psychologically [3]. In early times radiation was the means to treat such thermal injuries which gradually paved the path of reconstruction [4, 5]. "Free tissue transfer" was the initial tool for reconstruction for most of the head and neck defects [6]. Though many patients did not yield better results for this technique due to their multiple chronic conditions [7, 8].

And also, cultural regional flaps do not heal any particular defects. "The Supraclavicular artery flap" gives a dependable and flexible choice of reconstruction to bring under control of these disadvantages [9].

The Supraclavicular artery flap provides excellent flexibility, natural color and texture, and also requires a very short period of operation for reconstruction [10]. The chance of habituation of hardening of the muscle similar to split skin grafts was absent [11].

This flap was first used in grafting burn injuries after which it has shown increased success rates in a variety of complications mostly in plastic surgery, reconstruction of oncologic neck region and also as a lineage for oral cavity [12, 13].

In this study the circulatory of the flap and the tissue expansion to yield huge flaps with dependable circularity were studied. To our knowledge, using the surgically portable Doppler [14] to analyze the period of the supraclavicular vessels and intraoperative transillumination to protect the vessels are more important measures for texturing the accuracy of the supraclavicular artery flap.

Material and Methods

From a particular period of two years, 18 supraclavicular flaps were reported on 14 patients for many defects in the head and neck area. Among the patients 4 were males and 10 were females. The condition was mentosternal muscle hardening due to burns in 10 individuals, scar in cheek due to burns in 2 individuals, and connective tissue sarcoma in 2 individuals.

Totally 18 flaps were used for reconstruction. 2 were used for cheek defects, 14 flaps were used on the neck region, and 2 flaps were used on upper torso region. Out of the total flaps, 12 were expanded flaps and 6 were unexpanded flaps. The measurements of

the expended flap were 25 cm × 15 cm and the measurements of the unexpended flap were 9 cm × 7 cm [Table 1].

Fascial pedicle was the site of attachment in all the cases where in the flap was cushioned and the donor region will be closed essentially. All the individuals were informed about the post-surgery scar on the operating site and the chances of stretching of the scar. General anaesthesia was used in the surgery.

Flap design

A portable doppler was used to mark the supraclavicular vessels across the clavicle. In necks without burn injury the exit points were marked at the long muscle which connects the clavicle, mastoid and sternum, clavicle and superficial jugular vein.

Once the flaw was created the final measurements and outline was made. After locating the venules in an expanded flap, the flap was made to be in the central circulatory axis. The abscission started with the delivery of hardening of muscle, The flaw was then generated after the launch of hardened muscles and the flap measurement was made correspondingly.

Flap elevation

The elevation for the flap was made consistent by beginning the elevation from the sideward position and moving forward centrally to the subfascial region. The transmitting envelope of the targeted tissue from the trilateral branch of the thoraco- acromial region and dorsal circumflex humeral artery were surrendered. If feasible, central surgical cuts to the clavicle is

evaded in order to avert the visual scars. Just about the exit point a breakdown was made to protect the fascial pedicle. The breakdown was about 4 cm and this is considered as the central shaft for the flap. The lifted flaps were noticed for haemorrhage from the midline end to make sure of the flap's potentiality.

Flap inset

An active drain was involved to drain the flap and the graft region which was detached after three days of surgery. All the graft site is secured with loosening. An usual transparent dressing was given to the patients with some sticky tapes for holding the gauze in place.

The total period of surgery took a maximum of 3-4 hours as same as mentioned by Rashid et al [9]. Extension of the neck was maintained by the patients by placing a cushion beneath the shoulder and they were sent home after three days of surgery. The first checkup was on the fifth day after surgery mainly to change the gauze and to investigate the transplanted flap. The second checkup was on the 11 th day after surgery in order to discard the stitches.

Results

Excluding one flap, all other flaps showed a positive result (Table 1). The reason for this might be the expander moved farther from the explained patch of the flap besides all other individuals were fascinated with the final outcome. For upcoming individuals this will remain an useful method to undergo as the visual scar on the graft site was closed permanently.

Cervical collar and bigger gauze were not suggested and the time needed for complete recovery to undergo the patient's routine life was about 10 days and no longer. The patients were advised to come for checkups at 2 months intervals.

Table 1: Patient information

Age	Sex	Donor site (RIGHT/LEFT)	Flap (expanded/Natural)
38	F	L	E
18	F	R	N
18	F	L	E
45	M	L	N
20	F	R + L	E × 2
36	F	R	N
35	M	R + L	E × 2
TOTAL	M:4,F:10	R:8,L:10	E:12,N:6

Discussion

Since head and neck is the first and foremost visible region of the body it makes a huge challenge for the concept of resurfacing. Although hardening of muscles and split skin grafting are easily available techniques the outcome of the procedures does not satisfy the patients. The reason behind was dismatching of the color and appearance of the graft and possibility of deformity. On the other hand, methods like free flap require advanced technical instructions and elongated surgery periods.

The supraclavicular artery flap has a very long ancient history. Cormack and Lamberty explained this flap as an "obliquely expanded cervico-humeral flap" and performed research about its circulatory anatomy in the year 1983. [15, 16]

The Cervicohumeral flap was studied anatomically

in 1977 by the authors Mathes and Vasconez [17, 18]. The supraclavicular artery flap was first established by Lamberty in 1979 [19]. He explains the supraclavicular artery as a vessel envelope that targets a transferring tissue that starts from the parallel cervical vessels in 94% cases or from the suprascapular vessels in 6% cases [20].

To our knowledge, the use of supraclavicular artery flap for resurfacing head, neck and upper dorso effects stands as an outstanding choice. All the flaps gave an excellent outcome in the above study such as colour and texture match, solidity and the reconstruction quality. The patient's opinion on the reconstruction was also satisfactory. However anatomical divergences in the concept of the artery must be considered in terms of reaping and cushioning the flap.

Using a surgically portable doppler to analyse the period of the supraclavicular vessels and intraoperative transillumination to protect the vessels are more important measures for texturing the accuracy of the supraclavicular artery flap.

In cases of extreme burn injuries in the head and neck region, where the supraclavicular part is also included there can be no possibility for using it as a flap for reconstruction.

Conclusion

Hence, we hereby conclude that “The subclavicular artery flap” acts as an excellent and safe option for resurfacing including the color and texture match and also low chances of recontractures when compared to other grafting techniques. So, we do not have any opposition in suggesting the method for cosmetology treatment for using this flap and also for futuristic possibilities.

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