



VERSATILITY OF SUPRACLAVICULAR FLAP: OUR EXPERIENCE

Plastic Surgery

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ABSTRACT

Patients with burn deformity are unique in term of requirement of multiple surgeries, deficiency of acceptable donor areas. Supraclaviular flap is good surgical options in patients with large flap requirement which gives acceptable donor scar. In this study total seven patients were included who are managed with either unilateral or bilateral supraclavicular flap over period of eighteen months. The flap viability, mobility, functional, aesthetic outcome and complications were studied. It is a versatile flap, easy to harvest with excellent skin and color match and good flap reliability.

KEYWORDS

Supraclavicular flap, Head and neck reconstruction, Post burn neck contracture, regional flap

INTRODUCTION

Post burn scar contracture incidence is decreased after the common practice of early burn wound excision. In patients with neck contracture it adds to misery of burn survivor due to limited neck extension and impaired forward gauze. Many a times shoulder area is partially or completely spared in neck contracture patients which makes supraclavicular flap as acceptable donor area in terms of thin flap with good color, texture match with minimal donor site defect.

Supraclavicular flap is equally good for release of mild contracture to severe mentocervical contracture or even for unsightly scar in visible neck area with easy reach beyond the contralateral sternocleidomastoid muscle. In some cases, bilateral flaps are required to achieve adequate cover. Utility of this versatile flap is well beyond post burn neck contracture extending to unsightly scar, malignancy of auricular, cheek, floor of mouth area etc.

MATERIALS AND METHODS

For the present study we included six patients with post burn neck contracture with functional problem in whom supraclavicular area was spared. Patients with burnt or scared supraclavicular area were excluded from study and managed with split thickness skin graft only. Another patient with squamous cell carcinoma of pinna was managed using this flap. Out of seven patients two patients were managed with bilateral flap cover with split thickness skin graft.

In all cases supraclavicular flap was marked after doppler confirmation of transverse cervical artery. All flaps were marked with width ranging from 4cm to 8cm as much as can be primarily closed based on patient to patient basis. Length was raging from 10 cm to 24cm (without delay) depending on recipient defect. After contracture release under general anesthesia defect is estimated. Release incision is placed such that the skin graft is placed in shadow area of neck and skin flaps cover the visible area either with single flap or two flaps crossing each other forming Z plasty in place of straight line. Flaps are intentionally marked so as to cross midline with ease. One or two flaps are marked depending on defect size and availability of donor.

Intraoperatively flap was raised in subfascial plane after infiltration with 1 in 2,00000 adrenalin. Care was taken to raise flap with periosteum over medial third of clavicle. In some cases, pedicle was seen whereas in others it was raised with surrounding soft tissue. In two patients' flap was islanded where as in rest it was peninsular. Flaps were sutured to each other in z plasty manner. Remaining defect was covered with split thickness skin graft which was secured using tie over dressing on either side of flap. Donor area were closed primarily over drain.

RESULT

Flap viability: All flaps showed good viability without any necrosis or infection. Flaps even with length to breadth ratio of 3:1 survived

without any evidence of congestion or necrosis. Largest flap was extending over lateral arm short of deltoid insertion with dimensions of 8 x 24 cm. Fig. (1)



Fig. 1 – Eighty two year lady with recurrent BCC. Excision defect managed with right supraclavicular flap

Mobility of Flaps: Flaps are conveniently tailored to defect with rotation of 180 degree as island or peninsular flap. The dog ear in peninsular flap is minimal which settles over few months Fig. (2). In two cases flap readjustment was done so as to cover unsightly scar beyond flap and it has given excellent result. Thin skin of flap is excellent color and texture match with acceptable aesthetic outcome. In one pediatric case flap skin had post burn scar but flap showed good vascularity in post-operative period without any compromise Fig. (4). In one case two flaps were done in two consecutive settings. Initially flap was used to cover central neck scarring which gave aesthetically good result but during follow up same patient developed contracture band beyond flap for which contralateral flap cover was used.



Fig. (2) Left supraclavicular flap used to break post skin graft residual neck contracture. Photo showing well healed flap which expanded over period of one year with minimal dog ear deformity

Flap readjustment: In two cases the same flap was reelevated and used to cover additional defect in stage two in safe manner. The second surgery was planned at least a year after Fig (3).



Fig. (3) Operated case of post burn contracture with left supraclavicular flap – Flap thinning and advancement well beyond midline to remove retained pilosebaceous units.

Complications: Though in all cases flap had no problem but in 20% of the cases patient complained of donor site tension and stretching sensation. Following suture removal it healed with hypertrophic scarring. But none required graft for donor site closure.

Functional outcome: All cases had good neck extension in postoperative period. None of these patients with skin graft with flap or flap alone needed hard collar in post operative period to prevent recurrence Fig. (4) In one patient who developed scar contracture beyond flap was managed by contralateral flap. One patient had retained pilosebaceous unit and unstable scar was managed by existing flap advancement Fig. (3).



Fig. (4) – 8 year boy with 65% TBSA burns with recurrent neck contracture (post skin grafting) managed by bilateral supraclavicular flap with split skin graft

Aesthetic Outcome: This flap gives remarkably excellent contour and color match making it preferable option than free flap. It rarely needed debulking even in obese patients. When used as interposition with skin graft it gives aesthetically acceptable result in visible area of neck adding to patient's confidence.



Fig. (5) Case of recurrent post burn neck contracture managed with left supraclavicular flap with aesthetically excellent result

DISCUSSION

Post burn contracture neck leads to unique set of problems. Functionally there is restriction of neck extension, forward gaze is impaired, restricting the movement in social and professional areas. Ugly scar over most visible part, recurrent breakdown of scar, retained pilosebaceous units causing repeated infection, extrinsic contraction when extensive may lead to ectropion of lower lip and lower eyelid, breast distortion etc. Supraclavicular flap was first described in literature by Lamberty and Cormack. It was described as fasciocutaneous flap from cervico humeral area (1). Though its use is suggested for neck reconstruction since long time but simpler technique like contracture release and split thickness graft cover for post burn neck contracture is preferred at many centers. Our team wants to emphasize the versatility of this flap and a simple solution with more aesthetically pleasing stable cover decreasing the need for prolonged post-operative splinting. The chances of recurrence are less than skin graft. The same flap may be readjusted safely to give more acceptable results.

Various modifications and reviews of flap were suggested by many authors. Pallua et al studied the flap and suggested that it's a reliable flap (2). Following his foot steps other authors like Vinh et al, DiBenedetto et al studied and confirmed the same findings as Pallua (3) (4) (5) (6). DiBenedetto used supraclavicular flap for hemifacial atrophy with good results. Pallua in his various articles described flap being used as islanded and later as perforator flap. Sheriff et al studied relation between length of flap and distal end necrosis. In a series of 25 flaps length varied between 12 to 35 cm with mean of 20.76 cm. Only 12% of flaps had partial necrosis at distal end. These three flaps had length more than 23 cm (7). This study has used maximum flap length of 24cm without any complication.

Various anatomical studies have been performed from time to time explaining versatility and reliability. Flaps have been raised as pre expanded flap by Margulis et al and Pallua et al (8) (9).

CONCLUSION

Supraclavicular flaps are versatile flaps with simple and safe alternative for neck and face reconstruction. Technique is simple does not require specialized skill or microvascular expertise. This regional flap is easy to harvest in limited time avoiding patient morbidity due to free flap. More ever color and texture match by this flap is much superior to any free flap or simple split thickness skin graft making it preferred option in neck reconstruction.

REFERENCES

- Lamberty BGH, Cormack GC: Misconceptions regarding the cervico- humeral flap; British Journal of Plastic Surgery, 36: 220, 1983.
- Pallua N, Machens HG, Rennekampff O, Becker M, Berger A: The fas- ciocutaneous supraclavicular artery island flap for releasing post burn mentosternal contractures. *Plast Reconstr Surg*, 99:1878-1884, 1997.
- Vinh VQ, Ogawa R, Iwakiri I, Hyakusoku H, Tanuma K: Clinical and anatomical study of cervicopectoral superthin flaps. *Plast Reconstr Surg*, 119: 1464-1471, 2007.
- DiBenedetto G, Aquanati A, Balercia P, Forlini W, Bertani A: Supra- clavicular island fascial flap in the treatment of progressive hemifacial atrophy. *Plast and Reconstr Surg*, 121: 247-250, 2008.
- Pallua N, Demir E: Postburn head and neck reconstruction in children with the fasciocutaneous supraclavicular artery island flap. *Annals of Plastic Surg*, 60: 276-282, 2008.
- Pallua N, Wolter TP: Moving forwards: The anterior supraclavicular artery perforator (a-SAP) flap. A new pedicled or free perforator flap based on the anterior supraclavicular vessels. *Journal of Plast Reconstr and Aesthetic Surg*, 66: 489-496, 2013.
- Sheriff H, Garcia CV, Jaber S, et al. Supraclavicular Artery Island Flap: Relation Between Length and Distal End Necrosis. *Int Microsurg J*. 2018;2(1). doi:10.24983/scitemed.imj.2018.00089
- Margulis A, Agam K, Icekson M, Dotan L, Yanko-Arzi R, Neuman R. The expanded supraclavicular flap, prefabricated with thoracoacromial vessels, for reconstruction of postburn anterior cervical contractures. *Plast Reconstr Surg* 2007;119(7):2072-2077.
- Pallua N, Von Heimburg D. Pre-expanded ultra-thin supraclavicular flaps for (full-) face reconstruction with reduced donor-site morbidity and without the need for microsurgery. *Plast Reconstr Surg* 2005;115(7):1837-1844.