



Plastic Surgery

A STUDY ON FASCIAL FLAP AS A VIABLE ALTERNATIVE TO CONVENTIONAL FLAPS IN DIFFICULT WOUNDS

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ABSTRACT A durable coverage of a wound necessitates a reconstruction to look for a conventional flap like skin or a fasciocutaneous flap. Other flaps in use are musculocutaneous flap when it comes cover a defect which needs bulk or infected wound. However these flaps are not without accompanying complications. Donor site unsightly look is one of them, the classical example of which is radial artery forearm flap. A muscle or musculocutaneous flap may cause functional deficit of the muscle concerned. As such a viable alternative is always sought for to mitigate this problem. A fascial flap is one such viable option. This study is aimed at evaluating feasibility and efficiency of use of fascial flap in those situations requiring a stable flap cover.

KEYWORDS : Full thickness wound, Fasciocutaneous flap, Fascial flap

Introduction

Vascularised fascial flap has emerged as an answer to the problems associated with traditional fasciocutaneous and musculocutaneous flaps. Temporoparietal fascial flap has been mostly used among these. Other recently described fascial flaps are radial artery forearm, lateral arm, serratus anterior, groin, lateral supramalleolar fascial flaps. Devoid of skin islands, they are associated with minimum donor site morbidity. As a one stage procedure, these fascial flaps have decreased hospital stay, decreased health care cost and increased patient compliance. It has some associated donor site morbidities like alopecia (TPFF flap), wound dehiscence, hematoma formation. It also has its limitation in applying over wounds where tissue bulk is necessary. Hence, evaluating these vascularized free fascial flaps for resurfacing exposed tendons, bones & cartilages (where primary skin grafting cannot be done) & also as an adjunct of various reconstructive surgery of head, neck & extremities with identifying potential complications may provide us a powerful workhorse in the field of reconstructive surgery. Considering the potential of this procedure along with the cost-Benefit ratio, we decided to undertake this study to evaluate their role in resurfacing various defects of head, neck & extremities by evaluating complications as also aesthetic outcome.

Methods:

The present work was conducted in the Department of Plastic & Reconstructive Surgery, IPGME&R, Kolkata. Study was conducted from 1st January 2016 to 30th September 2017, a 20 month period. Patients in the age group of 10-60yrs. presenting with tissue with exposed tendon or bone or cartilage in extremities or head - neck region & undergoing reconstruction with vascularized fascial flap in the department of Plastic & Reconstructive Surgery, IPGME&R, Kolkata.

The study was carried out on cases chosen by simple random sampling from all the patients of age group of 10-60yrs. presenting with exposed tendon or bone or cartilage in extremities or head & neck where primary skin grafting cannot be done.

Result & Analysis

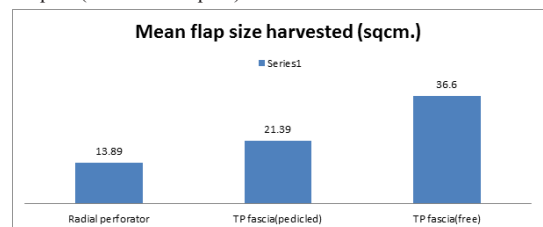
Out of the total 32 cases studied these are the observation analysed below. All patients were followed up for a minimum period of 3 month, and no patient was lost in follow up.

Out of the total 32 cases, maximum were in 10-20 yr. Age group (14 i.e. 44%), followed by 31-40 yr. (7 i.e. 22%), 21-30 yr. (6, 19%), 41-50 yr. (4, 12%), & > 50 yr. (1, 3%). Fascial flaps were used to cover defects located in hand (16), foot (3), ear (9) & other areas of head neck (4).

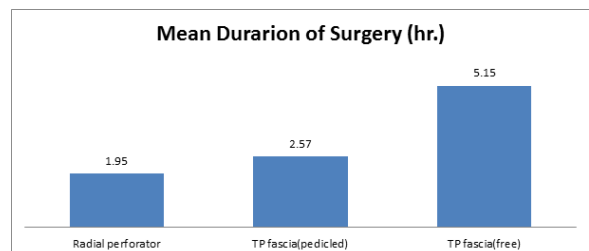
Out of total 32 cases, radial perforator based fascial flap (RPF) was done in 9 cases, pedicled temporoparietal fascial flap (TPFF) was done

in 13 cases, and free temporoparietal fascial flap (TPFF) was done in 10 cases.

Among the harvested flaps, mean flap size was highest in free TPFF flaps (36.6 sqcm.) with a standard deviation of 8.34 sqcm., while pedicled TPFF flaps had mean flap size of 21.39 sqcm. (S.D. = 9.99 sqcm.) & radial perforator fascial flap (RPF) had a mean flap size of 13.88 sqcm. (S.D. = 3.91 sqcm.)



Duration of the operative procedure was lowest in RPF (mean 1.95 hr., S.D. 0.39 hr.) & highest for free TPFF (mean 5.15 hr., S.D. 0.53 hr.), while pedicled TPFF had mean duration of 2.57 hr with S.D. 0.57 hr.



Among the cases where microvascular procedure involved, (free TPFF) 60% patients needed ITU.

No flap loss was encountered in pedicled TPFF, whereas RPF & free TPFF had flap loss of 22.2% & 20% respectively. All fascial flaps had a flap loss of 12.5%. Out of 9 RPF cases, 5 had graft loss. Pedicled TPFF cases had 1 case of graft loss out of 13 cases. Whereas in case of free TPFF, it was 5 out of 10. In total 11 cases of fascial flaps had some amount of graft loss out of total 32 cases.

Mean hospital stay was 12.4 day (S.D.=7.9) for all flaps. It was 18.1 days for free TPFF (S.D.=5.3), 11.6 days for pedicled TPFF (S.D.=3.4) & 7.1 days for RPF (S.D.=11).

Discussion

Among the 32 patients most (44%) of the patients were young and

majority were male being accounted for with traumatic etiology in this age group and sex. Among total 32 cases, 9 cases were operated with radial perforator based fascial flap(RPFF), 13 cases with pedicled temporoparietal fascial flap(TPFF), whereas 10 cases with free microvascular TPFF.

We used fascial flap in majority of cases to cover hand defects which resulted from trauma, burn, or post burn contracture release. Ignatiadis et al.¹, Pujó et al.² also used TP fascial flap(TPFF) & radial artery perforator based fascial flap(RPFF) respectively for resurfacing hand defects. In 10 cases we used pedicled TPFF flap for ear reconstruction. In 7 cases, it was used primarily for post burn ear reconstruction (where retroauricular skin was not available). In 2 cases, it was used secondarily as a salvage procedure to cover exposed cartilage framework after skin necrosis after Brent stage I ear reconstruction. In 1 case, it was used in Brent stage IV ear reconstruction to cover cartilage block used to achieve elevation of pinna & to create auriculocephalic sulcus. Park et al.³, Brent et al.⁴ also used this flap for ear reconstruction & presented very encouraging results. In 3 cases we have used pedicled TPFF flap to resurface defects in various areas of head neck except ear (2 in oral cavity after excision of CA cheek, 1 in forehead with exposed frontal bone). Similar uses of this was already described by Raffini et al.⁵, Matsuba et al.⁶, and Cheney et al.⁷ in their respective studies. We have used 2 free TPFF flaps for coverage of exposed tendons after contracture release in dorsum of foot. Lee et al.⁸ have used lateral supramalleolar adipofascial flap for such defects, but free TPFF was not used by them.

Among the harvested flaps, mean flap size was highest in free TPFF flaps (36.6 sqcm.) with a standard deviation of 8.34 sqcm., while pedicled TPFF flaps had mean flap size of 21.39 sqcm. (S.D. = 9.99 sqcm.) & radial perforator fascial flap(RPFF) had a mean flap size of 13.88 sqcm. (S.D. = 3.91 sqcm.). TPFF flap dimensions are maximally 14 X 12 cm⁹ (i.e. nearly 140 sqcm.) whereas RPFF flap dimensions are maximally 8 X 5 cm (i.e. 40 sq cm.)¹⁰ So, RPFF has been useful to cover small wounds of hand, wrist & forearm and pedicled TPFF has been useful to cover small to moderate wounds locally, whereas free TPFF has been useful to cover moderate size wounds provided thin coverage is required. However, extensive soft tissue defects cannot be covered with these flaps.

Regarding flap survival, no flap loss was encountered in pedicled TPFF, whereas RPFF & free TPFF had flap loss of 22.2% & 20% respectively. All fascial flaps had a flap loss of 12.5% in our study. In their study in 2000, Lai et al.¹¹ also found 100% survival rate of pedicled temporoparietal fascial flap in 9 cases of orbit reconstruction. Adam J. Hansen et al.¹² noted flap survival in all of 5 radial perforator based fascial flap. Taghinia et al.¹³ also noticed similar flap survival rates in their study regarding use of radial fascial flap for hand reconstruction. So, our study revealed almost similar flap survival rates in pedicled & free TPFF cases whereas slightly lower flap survival rate in radial perforator fascial flap (RPFF) cases.

Conclusion

Fascial flaps is being increasingly used various fields of head, neck, hand & foot reconstruction. In our study also two types of fascial flaps have been used temporoparietal fascial flap radial perforator based fascial flap. Results were mostly comparable as far as the basic requirement of resurfacing with added advantage of less donor site morbidity. Overall flap survival rate was 87.5 % (pedicled TPFF 100%, free TPFF 80% & RPFF 78%) which proves vascularised fascial flaps to be a prudent option for above mentioned indications. Though graft loss rate was a bit higher than previous literature, it was mainly in cases of traumatic contaminated wounds. So, we recommend for more stringent case Aesthetically also it scores over the bulky traditional flaps. So it can be recommended as a first line coverage option for suitable small to moderate size defects in head, neck & extremity reconstruction.

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