ORIGINAL RESEARCH PAPER

Volume-8 | Issue-5 | May-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PEARLS AND PITFALLS IN CROSS LEG FLAP COVER

Plastic Surgery

Dr. Sridharan Murugesan M.S., M.Ch., Associate Professor, Dept. of Plastic, Reconstructive & Faciomaxillary Surgery, Madras Medical College, Chennai - 600 003.

ABSTRACT

INTRODUCTION : Cross leg flap is considered as an important tool in the armamentarium of a Plastic Surgeon for covering the bones of the lower limb. This study is an analysis of 12 cases treated in our hospital from January 2018 to December 2018.

MATERIALS AND METHODS : Cases of road traffic accident with fracture of bones in the leg requiring cross leg flap cover was taken up for the study.

RESULTS : Out of the 12 patients, 1 patient had complete necrosis after one month; 2 patients had necrosis of the advancing edge for 5mm; rest of them settled well.

CONCLUSION : Cross leg flap can be used to provide coverage for bone, tendon even in cases not fit for free flap and also in patients with failed free flaps as a lifesaving option. It is also useful when the microvascular expertise is not available.

KEYWORDS

Cross leg flap, Viability, Necrosis

INTRODUCTION :

Cross leg flap has evolved through various stages after it was first described by Hamilton in 1854. It was Ponten who popularised the fasciocutaneous flaps with a safety margin of 1:3.[1] Cross leg flaps have been used in coverage of leg defects in lower limbs as a last resort, previously because of the demanding nature of surgery. Patients of older age, decreased mobility of knee joint were excluded but now the contraindications are really less in number.[2]

Increasing number of road traffic accidents present a huge burden on the part of Reconstructive surgeon, Orthopedician and Physiotherapist. Though free flap can offer early and quick management, adequate number of microvascular surgeons are still not available everywhere. Moreover any failures of such flaps takes more of a defensive approach and only pedicled flaps are used in that scenario to avert further crisis.[5]

Even in well established centres Cross leg flap offers a possibility that more surgeons are willing to perform given the nature of results. In the determined patients, results are excellent.

METHOD :

This study included 12 patients of lower limb defects requiring flap cover from January 2018 - December 2018. All the patients were Male with a mean age of 40 years. Five patients had defect in mid one-third of leg and seven had defects in lower one-third of leg. 11 patients had fracture site with bone exposed. One patient had extensors of leg exposed for the entire mid one-third leg distal half to proximal half of lower one-third leg with bone already covered by Soleus muscle with split skin grafting in the previous surgery. Defect size ranged from 8x5cm to 13x8cm (smallest to largest). Patients with gross medical illness, severe Osteoarthritis knee were not included.

WORKUP :

The patients were thoroughly examined for

1) site & size of the defect.
2) exposed bones,tendons,neurovascular structures.
3) wound contamination
4) condition of nearby skin
5) condition of contralateral leg.
6) vascular & neurological examination
7) surgical fitness-cbc,bt,ct,x ray,doppler studies.
8) skeletal stability & adequate circulation in the limbs are prerequisites to proceed with this flap.[3]

Use of external fixator has dramatically helped these patients with better ease of mobility in the bed,better cleaning of the surgical site and thus free from foul smell and discharges associated with plaster of paris casts.

VASCULAR ANATOMY :

Cross leg flap classically used the perforators of posterior tibial on the medial side of upper one-third and mid one-third leg, it was a medially based flap with horizontal direction or obliquely placed extending from upper one-third to mid one-third leg. We used the entire two-thirds circumference of the leg for elevating the flap.Each flap had nearly 3 to 4 perforators supplying the flap.[4]

SURGICAL TECHNIQUE :

Cross leg flap consists of transferring the required size of the flap to the opposite leg with adequate bridge segment to cover the defect followed by fixation of both legs in position with plaster of paris moulding or external fixator application.

DONOR LEG :

Flap is marked in the widest area of the leg not exceeding two-thirds of circumference in length, width is based on the vertical length of the defect which may contain bone, fracture site, tendons etc. Horizontal length of flap includes defect width with bridge segment which allows placement of the flap. It is essential that flap crosses to the opposite leg, crossing of leg is immaterial, endpoint of the flap raising stops 2.5cm from the tibial margin anteriorly in order to protect the perforators. Versatility of the flap is due to the inclusion of fascia.

All patients were operated under spinal anesthesia in the supine position. Ten patients had external fixator already in the injured leg. First, defect edges freshened. Doubtfully viable tissues including bone excised. Wound washed with saline after securing complete hemostasis.

In the donor leg, flap marking already completed in the pre-anesthetic time was confirmed with Lint pattern and elevation started including the deep fascia in the flaps with sutures to prevent shearing. Flap inset given with non-absorbable suture materials with Segmuller drain after covering raw areas with SSG including the bridge segment. With the help of Orthopedic colleagues 2-3 pins passed in the donor leg and external fixator connected with the rods providing stable attachment to the flap. All the dressings completed.

POST OP CARE :

It is surprising to note inspite of the fixed position our patients cooperate very well and adjust to the need well. In the predetermined patients complications of flap are relatively few. First look done after 48 hours, drain removal done after 5-7 days, suture removal after 3 weeks, flap division planned at 3 weeks after inset.

RESULTS :

Surgery time ranges from 2 to 2.30 hours. Patients are on follow-up from 3 to 14 months. Complications include infection, edge necrosis, wound dehiscence. One patient had total flap loss after 45 days. Two patients had edge necrosis with retraction of flap which was managed by extending the flap division by one more week.

Fig.1., Edge necrosis

Fig.2., Total loss of flap. Healed donor leg seen.

DISCUSSION :

Cross leg flap has seen many modifications from the beginning and knowledge of flap anatomy is able to make it a better tool in the armamentarium of Plastic Surgeon. Ever since Ponten's modification, the length and survival of the flap has achieved greater dimensions. Victims who are in an important role of breadwinner of the family are put down and as a result, family feels double impact - one is loss of earning and other the expenditure beyond their capabilities.[6]

Free tissue transfer was favored over cross leg flap in the last two decades. However this flap has its place in the armamentarium because there are situations and lack of facility for free flap.

There are cases beyond the scope of Reconstructive ladder with huge defects, exposed bones, tendons, neurovascular structures. Coverage by free flap requires good recipient vessels which may not be available always forcing for other choices. Inability to raise local flaps, poor recipient vessels makes cross leg flap the Automatic choice. Failures are more common in trauma situations because of incorrect assessment of deeper injuries. As per Gillie's principle, it is necessary to have a life boat for emergency. Cross leg flap helps to tide over the crisis when all others fail.

Fig.3(left), Mangled limb covered with flap
Fig.4(right), Flap cover for heel

INDICATIONS :

Thus contraindications for free flap are indications for cross leg flap.
They are :
1) major lower limb trauma
2) Axial vessel damage
3) previous trauma,thrombosis of vessels
4) locally diseased arterial tree
5) No recipient vessel
6) prolonged surgery not possible.
7) electrical burns
8) single vessel limb
9) delayed referral

Advantages of cross leg flap :

1) easy dissection
2) Versatility, short operating time
3) minimal donor site morbidity
4) replacement with like tissue.
5) revision/exploration surgeries not necessary.

Fig.5., Cross leg flap - comfortable at rest.

CONCLUSION :

We concur with the view of limb salvage by other papers.[7] When marginal necrosis/flap dehiscence occurs, extension of flap division by one week helps. All plastic surgeons need to learn this technique for use as Lifeboat.

REFERENCES :

1. Ponten B. The fasciocutaneous flap : its use in soft tissue defects of the lower leg. Br J Plast Surg. 1981;34:215-20.
2. HAYES, H. (1962). Cross-leg flaps after the age of fifty. Plastic and Reconstructive Surgery, 30,649.
3. STARK, R. B. (1952). The cross-leg flap procedure. Plastic and Reconstructive Surgery, 9, 173.
4. Reisler T. Buziashvili D, Liu FC, Datiashvili RO. Revisiting the fasciocutaneous perforator cross-leg flap. Eplasty. 2016;16;ic16
5. Long CD, Granick MS, Solomon MP. The cross-leg flap revisited. Ann Plast Surg. 1993;30:560-3.
6. Agarwal P, Raza H. Cross-leg flap: Its role in limb salvage. Indian J Orthop. 2008;42:439-43.
7. Shoeib M. Cross-leg flap : its reliability and outcome. Modern Plastic Surgery. 2013:3:9-14.