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Case Report

Standard cross leg flap, still a work horse for compound fracture leg bones with extensive soft tissue damage: a case report

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ABSTRACT

This case report presents a 32 year old male patient with h/o road traffic accident resulting in compound fracture of the right tibia and fibula with extensive soft tissue injury and exposed tibia of 12×5 cm. The fractures were stabilized with ext. fixator and exposed tibia was covered by a medially based standard Cross Leg flap of dimensions 16×12 cm, though the largest dimensions described for standard cross leg is 22×10 cm.

Keywords: Leg defect, Standard cross leg flap, STSG

INTRODUCTION

Cross leg fascio-cutaneous flaps are now considered as life boat in current surgical practice and are not used frequently due to availability of other local flaps e.g. fascio cutaneous, muscle, myocutaneus and free flaps.[1,2] The free flaps are 1st choice for soft tissue coverage in distal leg defect.[3] There are however some clinical situations in which local fasciocutaneous, muscle or myocutaneus flaps are not available and occasional free flap may have failed because of the technical error or damaged recipient vessel. In such situation cross leg flap is the flap of choice.[4] Most of the time retrograde cross leg fasciocutaneous flap based on the perforator of PTA and PA is used but we are presenting a case of standard cross leg flap of size 16×12 cm for covering the defect of 12×5 cm over the leg and ankle region.[5]

CASE REPORT

A 32 year old male patient presented to us with the compound fracture of the right tibia and fibula with extensive soft injury. Primarily skeletal stabilization in form of external fixator was achieved by orthopaedics colleague. The wound was initially prepared with Normal saline dressing and subsequently patient had defect of dimension 12×5 cm. Since patient had compromised vascularity of the leg with adjacent muscles being traumatized and skin grafted area all around, no loco regional or free flap was feasible. Hence, medially based standard cross leg flap was planned for covering the exposed tibia.

Surgical technique

Planning in reverse and marking of the flap was done with upper limit of the flap was 8 cm from popliteal crease and lower 5 cm from axis of the ankle joint, lateral extent of the flap was up to the fibula contrary to mid-calf. Surgery was performed under epidural anaesthesia and tourniquet control, flap was harvested in sub facial plane and donor site was grafted with STSG. After harvesting of the flap both legs were fixed together in cross leg flap position using external fixator and flap inset was done to recipient area. Patient was able to move both leg simultaneously at knee joint level so to avoid pressure sore at the heel region. Since flap inset was 70%, no surgical delay was applied and complete flap division

was done at three week intervals and bridge segment was returned to the donor site. No donor site morbidity detected and post-operative period was uneventful as shown in Figure 1a and 1b.

Figure 1a and 1b: Surgical technique

DISCUSSION

An injury to lower limb can be a complex problem often involving fractured bones, exposed tendons and soft tissue defects. This is further complicated by poor vascularity due to damage to axial vessel, thrombosis of vessels and de vascularization of skin and soft tissue in adjacent zone of trauma. The management of such complex lower limb defects has evolved from adjacent skin flaps to regional fasciocutaneus, muscle and myocutaneus flaps to various free flaps. In this era of rapidly advancing microsurgery free flap is the procedure of the choice in reconstruction of the damaged lower limb. But in certain circumstances like-damage to adjacent vessels causing vascular thrombosis or perivascular fibrosis, single vessel limb free flap is practically not possible. Also there are situations where free flap has been failed and limited options are available. Cross leg flap has stood the test of time as a highly reliable source for such complex lower limb wound reconstruction.

The era of cross leg flaps can be divided into three periods.

- Before Ponten (<1981)
- Ponten (1981) and
- After Ponten (1985/90).

Before Ponten the cross leg flaps were mere skin flaps without inclusion of deep fascia which limited their usefulness to equal length-breadth ratio (1:1). To enhance the length, 'delay' was necessary, which increased the number of procedures and thereby hospitalization for several weeks. The bridge segment was kept as minimum as possible and to avoid tension, limbs were crossed maximally.

The incidence of development of joint stiffness and sores were high. The flaps were detached in stages. Later, Ponten (1981) described 'super flaps' with inclusion of deep fascia augmenting the circulation.[6] These fasciocutaneous flaps then had the liberty of 3:1 ratio. This provided more room for movement between limbs avoiding cross legging with minimal discomfort and inconvenience to the patient. Delay and division of the flap in stages became optional. Traditional concerns about use of cross leg flaps like difficulty in immobilizing both limbs for 2-3 weeks, joint stiffness have largely been tackled with use of external fixator.[7] The external fixator is quick and easy to apply, light in weight less awkward to both patient and nursing personal, and easy to adjust in ward. External fixator by itself doesn't complicate the flap and donor site. Once the external fixator is removed the lower limb range of motion is regained rapidly with patient getting normal gait and activity. Also the external fixator aids greatly in wound care as well as patient mobility and positioning.

The incorporation of fascia or muscle has reduced the chances of necrosis of flap and extended its dimension to 3:1 in length to breadth ratio. Though other complications like increased chances of thrombo embolism and donor site cosmetic deformity are still around, the advantages of the cross leg flap like ease of the dissection, versatility, minimal donor site morbidity, replacement of like with like tissue and lastly of robust blood supply make it an option worth considering especially in limbs where there are no option left. The maximum dimension of cross leg flap depends upon the built of the patient. The largest dimension of standard cross leg flap mentioned in literature is 22×10 cm^2.

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