

ÇAPRAZ BACAK FLEBİ UYGULAMALARIMIZ VE LİTERATÜRÜN GÖZDEN GEÇİRİLMESİ

Cross Leg Flap; Report of a Small Series and Literature Review

Emre YURDAKUL¹, Fatih KARAASLAN², Mahmut MUTLU³

ÖZET

Bu çalışmada alt ekstremitte tip 3c açık kırıklarda çapraz bacak flebi ile yapılan rekonstruksiyon uygulanan 4 hasta sunulmaktadır. Çapraz bacak flebi özellikle verici saha damar yapılarının ağır hasara uğradığı kemiğin açıkta olduğu yaralanmalarda çapraz bacak flebi, taşıdığı ek avantajlar ile güvenilir ve uygun bir seçenektir. Serbest fleplerin uygun olmadığı hastalarda iyi bir seçenektir.

Anahtar kelimeler: *Serbest doku flepleri; Yumuşak doku travmaları; Çapraz bacak flebi*

ABSTRACT

This article reports 4 cross-leg free composite tissue flaps for repairing the severe composite tissue defects in lower leg without suitable adjacent recipient vasculature for microvascular anastomosis. These flaps are safe and effective alternative in lower extremity reconstruction. In the absence of appropriate recipient vessels cross-leg free flaps may provide successful repair. Cross-leg flaps are a good choice for reconstructing traumatized lower extremities, especially when free flaps cannot be used. The objective of this study was to introduce a method for repairing large soft-tissue defects on the lower extremity.

Key words: *Free tissue flaps; Soft tissue injuries; Cross-leg free flaps*

¹Osmaniye Devlet Hastanesi,
Ortopedi ve Travmatoloji
Anabilim Dalı, Osmaniye

²Bozok Üniversitesi Tıp Fakültesi,
Ortopedi ve Travmatoloji Anabilim
Dalı, Yozgat

³Erciyes Üniversitesi Tıp Fakültesi,
Ortopedi ve Travmatoloji Anabilim
Dalı, Kayseri

Emre YURDAKUL, Uzm. Dr.
Fatih KARAASLAN, Yrd. Doç. Dr
Mahmut MUTLU, Prof. Dr.

İletişim:

Uzman Doktor Emre YURDAKUL
Osmaniye Devlet Hastanesi,
Ortopedi ve Travmatoloji Anabilim
Dalı,Osmaniye

Tel: +90 328 826 12 00

e-mail:

dr.yurdakul@hotmail.com

Geliş tarihi/Received: 26.05.2015

Kabul tarihi/Accepted: 02.07.2015

Bozok Tıp Derg 2015;5(3):58-61
Bozok Med J 2015;5(3):58-61

INTRODUCTION

The cross-leg flap dates back to 1854, when it was described by Hamilton to cure a chronic ulcer and after that it was successfully used for soft tissue coverage in the distal leg (1). The use of cross leg flap is accepted as the standard reconstruction method in severe defects of the lower extremity. The main indication for a cross-leg flap is the need for flap coverage over a defect on the knee, shin, ankle, or foot with exposed bone (2). Since the 1990s microvascular surgery has been regarded by many centers as the gold standard for salvaging severely traumatized lower extremities. However, free flap operations, which are technically highly demanding, expensive, and are not applicable for all the patients. Free flaps cannot be used in patients who suffer extensive lower extremity injury with axial vessel damage. On the other hand cross leg flaps are safe and viable option in primary and secondary care centers for the reconstructive surgery of the lower limb in situations such as larger distal defects in the leg and foot where distally based flaps from the ipsilateral leg calf are not feasible (1). In addition, electrical injury, single vessel extremities receiving radiotherapy after

tumor resection are relative contraindications for free flap. Occasionally, a free flap may also have failed because of these results. In these situations, a cross-leg flap is the best choice.

CASE REPORT

Four patients who suffered from traumatic soft tissue injuries of lower extremities were treated in our surgery department (Table 1). Patients presented Gustilo grade 3b open fractures were treated with cross-leg flaps. All four defects were covered with a medially based narrow pedicled cross leg flap based on 2-3 adjacent posterior tibial perforators about 1-2 cm from the medial border of the tibia. The perforators are identified preoperatively by a hand held Doppler. We planned a three stage operation for reconstruction of the leg. In the first stage all of the devitalized tissue, including skin, soft tissue, and tibial bone fragments in the left leg were debrided. After serial debridements, a soft tissue defect that constituted % 70 of tibial surface were produced (Fig 1 a, b).

Table 1: Demographics and treatment data of four patients

Case	Sex/Age	Size of defect (cms)	Division done after (Days)	Complications	Duration of follow up (weeks)
1	Female (28)	18,21	21	None	32
2	Male (45)	20,28,	20	None	24
3	Male(24)	16,24	21	None	48
4	Male(40)	22,24	21	None	54



Figure 1a,1b: Patient 1 preoperative and postoperative fourth day

On the second stage the flap was planned using a cloth pattern of the defect with generous margin and to include the length of bridge as short as possible. The calf was the principle donor site for cross-leg flap. After proper preoperative marking, the flap was raised including the fascia. The donor site of the flap was split skin grafted, and the flap was sutured over the defect. Both

the limbs were kept in position using the external fixator. Division of the flap was performed in patients after mean 21 days. At follow-up, the patients were evaluated for functional as well as for cosmetic outcome (Fig 2). All of the flaps survived and the soft tissues healed uneventfully (Fig 3a, b).



Figure 2: Patient 1 results at 4 months of follow up



Figure 3a,3b: Patient 4 last follow up

DISCUSSION

Soft tissues post traumatic defects of the lower leg are a challenge for reconstruction, especially when bone or eventually a fracture is exposed. Microsurgical free flap is now a well-established procedure in the reconstruction of severely damaged lower extremities. However,

successful result depends on the availability of suitable vessel with healthy vascular wall and adequate size for microvascular anastomosis. Recipient vessels for free flaps transfer can be absent or severely damaged representing a contraindication to free flaps.

The cross-leg neuro-fasciocutaneous flap is a traditional way of repairing a large-sized area of soft-tissue defects on the foot and lower limbs. This method involves 2 procedures. The first depends on a fascial flap and a random flap, with the pedicles located proximally. This procedure has the advantages of easily forming the flaps, generating reliable post-surgical outcomes, relying on low technology, having a short-operation time, and being used in clinical practice. Nevertheless, several disadvantages of the first flap procedure exist, such as insufficient incised flap area, limited physical positioning, and postural difficulties. The second flap procedure for cross-leg transfer mainly involves the use of reverse island flaps, which are supplied by a main artery of the contralateral leg (3-5).

In 1981, Potén (6) pointed out the significance of the fasciocutaneous circulation. Subsequently, the vascular anatomy of the skin was closely detailed and fasciocutaneous flaps were designed with predictable circulation (7,8). In 1992, Masquelet et al (8) described skin island flaps supplied by the vascular axis of the sensitive superficial nerves of the leg. The distally based lower-leg fasciocutaneous and adipofascial local flaps, described by Masquelet et al [8] offer an easy and reliable surgical option, to free flaps in presence of distal third soft tissues defects of the leg and foot of small and medium extension.

The use of cross-leg flap has previously been limited by the incidence of complication such as necrosis, joint stiffness, thromboembolism (9). In our patients, extremity range of motion is regained rapidly and there were no complications related to the donor site or flap itself or by the fixation.

It is our opinion that the fasciocutaneous cross-leg flap may still be required to obtain adequate coverage in very specific cases. By incorporating fascia or muscle and the use of external fixator, the versatility of the flap can be enhanced. This flap is easy to perform and does not require the sophisticated equipment or expertise of microanastomosis

REFERENCES

1. Lixuan Lu, Antang Liu, Lie Zhu. Cross-Leg Flaps: Our preferred alternative to free flaps in the treatment of complex traumatic lower extremity wounds. *J American collage of surgeons*. 2013; 217(3):461-471.
2. Contedini, L. Negosanti, E. Cross-Leg as Salvage Procedure after Free Flaps Transfer Failure: A Case Report. *Case Reports in Orthopedics*. 2012; doi:10.1155/2012/205029.
3. Agarwal P, Raza H. Cross-leg flap: its role in limb salvage. *Indian Journal of Orthopaedics*. 2008; 42(4): 439-443.
4. A. V. Georgescu, C. Irina, and M. Ileana, "Cross-leg tibial posterior perforator flap," *Microsurgery*. 2007; 27(5):379-383.
5. Dong ZG, Liu LH and Zheng L. Reconstruction of foot and ankle defect with reversed sural neurofasciocutaneous flaps in children. *Za Zhi*. 2008; 24(1): 20-22.
6. B. Potén. The fasciocutaneous flap: its use in soft tissue defects of the lower leg. *Br J Plast Surg*. 1981;34(2):215-220.
7. A.C. Masquelet, M.C. Romana, G. Wolf. Skin island flaps supplied by the vascular axis of the sensitive superficial nerves: anatomic study and clinical experience in the leg. *Plast Reconstr Surg*. 1992;89(6):1115-1121.
8. R.J. Fix, L.O. Vasconez. Fasciocutaneous flaps in reconstruction of the lower extremity. *Clin Plast Surg*. 1991;18(3):571-582.
9. Momeni A, Buntic RF, Buncke GM. Cross-leg flaps: preferred alternative to free flaps? *J Am Coll Surg*. 2014;218(2):308-9.