JMSCR Vol||05||Issue||11||Page 30556-30559||November 2017

www.jmscr.igmpublication.org
Impact Factor 5.84
Index Copernicus Value: 71.58
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v5i11.126

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Case Report and Surgical Technique: Closure with a Filleted Hallux Flap after Transphalengeal Amputation of the Big Toe for Osteomyelitis in the Diabetic Foot

Authors
Dr Krishna Prasad K[1], Dr Sundeep Vogu[2], Dr Deepak H[3], Dr Amal Abraham[4], Dr Sandeep Reddy[5]
[1]Prof. Dept. of General Surgery Sridevarajurs Medical College, Kolar
[2]Post Graduate Dept. Dept. of General Surgery Sridevarajurs Medical College, Kolar
[3]Asst. Prof., Dept. of Plastic Surgery Sridevarajurs Medical College
[4]Prof. Dept. of General Surgery Sridevarajurs Medical College, Kolar
[5]Post Graduate Dept. Dept. of General Surgery Sridevarajurs Medical College, Kolar

Abstract
Wound closure for the tissue defect caused by amputation of digit, for a diabetic foot is challenging. We describe a surgical technique and a case report of filleted hallux flap in the management of post amputation defect aosteomyelitic diabetic foot wound. This reproducible technique needs comparatively minimal technical complexity and is a good option in the management of diabetic foot wounds where soft tissue coverage is required.

Introduction

Alpert and Buncke were the first surgeons who described the concept of fillet flaps in 1978, while treating mutilated hand injuries. they used a microvascular free flap from a non-replantable part for reconstruction. Fillet flaps are axial pattern flaps that are harvested from non-functioning or unsalvageable osseous and soft tissue structures. These can then be used as a pedicle is land, or microvascular free flaps for reconstruction and are commonly used in the settings like trauma [1].

Kuntscher et al. have described the concept of fillet flaps in their series of 50 finger and toe fillets[2].

This concept has been extended to non-traumatic conditions, such as defects caused by large pressure sores or by extensive tumor resection. Here the flaps are raised from anatomically intact limbs [3-5].

Routinely the open wounds caused by diabetic foot infections are left to heal by secondary intention or by negative pressure wound therapy. This is due to poor vascularity of the foot [6].

Fillet flap is one of the options for soft tissue closure in the diabetic foot, can be a primary closure or a staged reconstruction and this depends on the patients vascular status.

Advantages of this fillet flap include absence of donor site morbidity, good durability, and leg length preservation, and thus preventing the need

for more proximal amputation for adequate soft tissue coverage. The clinical outcomes of this technique for pressure wounds or selected amputations (forefoot or transmetatarsal) in diabetic patients were proven to be reliable [7-8].

The purpose of this article is to describe the surgical technique of a filleted hallux flap in the management of closure of soft tissue defect caused by inter phalyngeal amputation in the osteomyelitic diabetic foot.

Case Report

A 56 -year-old female home maker with a history of poorly controlled diabetes mellitus (preopera-tive hemoglobin A1c of 9.6%) was admitted to the hospital with a 4-week history of non healing ulcer left foot with prior history of trauma to the left foot. On examination of the ulcer, there is slough, with foul smelling discharge.

Erythema and edema were noted over the dorsal and lateral aspect of the left great toe. Dorsalis pedis and posterior tibial pulses were palpable. Debridement of the ulcer with regular dressing done, but the ulcer showed hyper granulation tissue with foul smelling discharge (fig. 1). Chemical cauterization with copper sulphate has been tried ,but without much success.

Left foot plain radiographs (fig. 2) showed signs of osteomyelitis, with disruption of inter phalyngeal joint.

Patient has been scheduled for A partial ray (toe and metatarsal) amputation of great toe, under ankle block using 2% xylocaine solution.

The fillets flap was raised before performing amputating and has been used to close the defect with primary suturing.

Operative Technique

The surgical procedure was performed under ankle block with patient in supine position. A tourniquet was used for hemostasis. A sterile pillow was placed under the ipsilateral popliteal region to allow for better positioning during the procedure via external rotation of the leg. An incision was made over the medial aspect of the great toe from the tip to the metatarsal joint, thus exposing the bone. The unhealthy bone is then removed. The plantar flap is carefully preserved (fig. 3& 4), and filleted neurovascular bundles are preserved to ensure flap survival. The filletedskin flapwas then approximated dorsally to the wound using a non-absorbable ethilon3-0 suture, covering the exposed bone .(fig.5)

Haemostasis was achieved and a sterile dressing done. The patient was kept non-weight bearing on the left foot for 2 weeks. Analgesia was achieved using oral NSAIDs &paracetamol.Intravenous antibiotics were used for 1 week due topriorinfection and immunocompromised state due to uncontrolled diabetes mellitus. Post operatively the wound was inspected for the presence of anydehiscence, flap necrosis, or infection.(fig. 6) Sutures were removed 10 days postoperatively.

Results

The diabetic foot wound healing was uneventful. There was no flap necrosis, secondary infections, or wound dehiscence at 10 days post operation. The patient returned to normal house hold chores 3 weeks postoperatively. At 5 weeks follow up, the flap was viable and patient was able to walk independently without pain. There was no flap necrosis, recurrent infection, scar complications and ulceration under the remaining stump of hallux.

Discussion

Wound Healing by Secondary intention or negative pressure wound therapy is commonly the preferred method, but it carries a significant amount of time and cost to patients. Primary closure for diabetic foot infections is rarely performed due to the increased risk of postoperative skin necrosis and poor wound healing secondary to poor vascularity[9].

Hemoglobin levels of more than 10 g/dL and serum albumin of more than 25 g/L are important to ensure good post operative wound healing [10].

Wound coverage is feasible, if the foot has moderately wellperfused vascularity. Nather and Wong suggested essential criteria for distal amputations of the foot, includes the presence of one or two palpable pedal pulses, ABI of at least 0.8, and TBI of at least 0.7. This criteria should be Applied before performing surgical reconstruction, which. This is to ensure good wound healing for the flap reconstruction[11].

In this case report, wound coverage over the exposed bone following a partial ray amputation great toe was quite challenging. Traditionally, surgical treatment would have been either healing by secondary intention or further amputation proximally. Both these methods leads to increased cost, treatment time, and patient morbidity. local or distant flap coverage is a viable alternative.

The surgical technique described in this case report preserves the phalangeal length and accelerates wound healing, which is important for normal walking and foot pressure distribution. The same method can be applied to other digits. Harvesting the fillets flap, with partial amputation is justified as the next surgical option would have involved amputation of the great toe in a more proximal site.

Aerden et al. have described in their case series a primary closure with a fillet flap for the big toe for osteomyelitis of diabetic foot this showed a delayed mean healing time of 44 days with disappointing longterm results, with recurrent ulcers under the remaining metatarsal head [12].

Our case report did not show any similar complications of ulceration under the remaining metatarsal head.

To conclude, this case report describes the surgical technique of the hallux fillet flap for diabetic foot closure Advantages include good soft tissue durability and preventing the need for more proximal amputation for adequate soft tissue coverage.

As this is a case report, more patients will be needed to support the concept of filleted hallux flaps in terms of patient selection and clinical outcomes for soft tissue closure of the diabetic foot.

Randomized controlled trials comparing patient selection criteria and different methods of flap coverage for partial ray amputations in diabetic patients are needed.

Conclusion

The filleted hallux flap reconstruction is a reproducible technique which incurs comparatively minimal technical complexity and thus provides a good option in the management of diabetic foot wounds where soft tissue coverage is required.

References

1. Alpert BS, Buncke HJ. Multi lating multi digital injuries: use of a free microvascular flap from a nonreplantable part. J Hand SurgAm 1978; 3: 196_8.
2. Ku¨ntscher MV, Erdmann D, Homann HH, Steinau HU, Levin SL, Germann G. The concept of fillet flaps: classification, indications, and analysis of their clinical value. Plast Reconstr Surg 2001; 108: 885_96.
3. Talbot SG, Mehrara BJ, Disa JJ, Wong AK, Pusic A, Cordeiro PG, et al. Soft-tissue coverage of the hand following sarcoma resection. Plast Reconstr Surg 2008; 121: 534_43.
4. Ghali S, Harris PA, Khan U, Pearse M, Nanchahal J. Leg length preservation with pedicled fillet of foot flaps after traumatic amputations. Plast Reconstr Surg 2005; 115: 498_505.
5. Shaw WW, Ko CY. Salvage of a below-the-knee amputation with a fillet of foot free flap: a 15-year follow-up. Ann PlastSurg1996; 37: 433_8.
6. Noble-Bell G, Forbes A. A systematic review of the effectiveness of negative pressure wound therapy in the management of diabetes foot ulcers. Int Wound J 2008; 5: 233_42.
7. Kalbermatten DF, Kalbermatten NT, Haug M, Scha¨fer D, Pierer G. Use of a combined pedicled toe fillet flap. Scand J Plast ReconstrSurg Hand Surg 2004; 38: 301_5.
8. Lin CH,Wei FC, Chen HC. Filleted toe flap for chronic forefoot ulcer reconstruction. Ann PlastSurg 2000; 44: 412_16.
9. Nather A, Hong NY, Lin WK, Sakharam JA. Effectiveness of bridge V.A.C. dressings in the treatment of diabetic foot ulcers. Diabet Foot Ankle 2011; 2: 5893, doi: http://dx.doi.org/10.3402/dfa.v2i0.5893
10. Pinzur MS, Stuck RM, Sage R, Hunt N, Rabinovich Z. Syme ankle disarticulation in patients with diabetes. J Bone Joint Surg Am 2003; 85-A: 1667_72.
11. Nather A, Wong KL. Distal amputations for the diabetic foot. Diabet Foot Ankle 2013; 4: 21288, doi: http://dx.doi.org/10.3402/dfa.v4i0.21288
12. Aerden D, Vanmierlo B, Denecker N, Brasseur L, Keymeulen B, Van den Brande P. Primary closure with a filleted hallux flap after transmetatarsal amputation of the big toe for osteomyelitis in the diabetic foot: a short series of four cases. Int J Low Extrem Wounds 2012; 11: 80_4.