

Vascularized Fibular Graft for Non-Union of Tibial Long Bone with Acute Exacerbation Osteomyelitis in Pediatric Patient: A Case Report

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DOI: <https://doi.org/10.52403/ijhsr.20240429>

ABSTRACT

Introduction: Osteomyelitis has more consolidated data in the medical literature, and is considered a predominantly pediatric disease, with 85% of patients aged below 17 years. Debridement is necessary for treatment, sometimes causes a bone defect. Vascularized bone grafts, like the vascularized fibular graft as surgical management for long bone osteomyelitis, that may maintain their intrinsic blood supply, speed up bone healing, and promote bone hypertrophy. This case report aims to evaluate about osteomyelitis on the right tibial bone with treated by vascularized fibular graft.

Case of presentation: A 4 years old female Balinese complained of swelling in the right leg from 8 months ago. The physical examination of right leg region revealed swelling over middle part of leg, scar post-operative and redness over middle part and tenderness around swollen soft tissue. On laboratories examination revealed an elevated CRP (26) and an elevated WBC (15,420). Meanwhile, On X-ray examination revealed suggestive osteomyelitis on the right tibial bone. We decided to performed surgical approach by using vascularized fibular graft to tibial bone infected. The patient was not complaint after surgery, and she undergo to follow rehabilitation protocol.

Discussion: VFF seems to be a valuable reconstructive technique for the treatment of osteomyelitis in tibial bone. The indication for VFF is skeletal defect greater than 6 cm in length. Fibular osteocutaneous is the most commonly used as vascularized bone graft clinically.

Conclusion: In conclusion, this case describes a rare presentation of spontaneous osteomyelitis of the tibial bone. A vascularised bony reconstruction with a VFF graft was performed. There was no complications following surgery in this patient.

Keywords: Osteomyelitis, vascularized fibular graft, tibial bone, long bone, graft.

INTRODUCTION

Osteomyelitis has more consolidated data in the medical literature, and is considered a predominantly pediatric disease, with 85% of patients aged below 17 years. Debridement is necessary for treatment, which causes a bone defect. The goal is to transform a septic

environment into an aseptic one, after which the missing bone will be rebuilt. Bone transport, Masquelet, and VFF graft are options for defect reconstruction.¹

Moreover, Vascularized bone grafts, like the vascularized fibular graft as surgical management for long bone osteomyelitis,

that may maintain their intrinsic blood supply, speed up bone healing, and promote bone hypertrophy. They are frequently used for the reconstruction of significant skeletal defects caused by trauma, tumor resection, or congenital diseases. Only a few studies have examined the use of the free vascularized bone graft for the treatment of infected bone defects, despite the fact that they are a particularly difficult and significant subtype of bone defects.²

Herein, we report on a case of tibial osteomyelitis which was treated originally with a vascularized fibular graft (VFF) but required subsequent application of the Masquelet technique to achieve bone restoration and limb function.

CASE PRESENTATION

A 4 years old Balinese female complained of swelling in the right leg from 8 months ago. Swelling at the leg is also accompanied by pain. Patient denied any gait disturbances. Patient referred from Gianyar Hospital by Orthopaedic Surgeon with diagnosis Osteomyelitis Right Leg. History of trauma and other pain history were denied. Family history of the same disorder (-). Patient is said to have no systemic or congenital disease

The physical examination of right leg region revealed swelling over middle part of leg, scar post-operative and redness over middle part and tenderness around swollen soft tissue. The dorsalis pedis artery palpable, CRT <2", the oxygen saturation was 99%, on movement examination revealed active ROM knee 0/130, active ROM ankle 20/50, active ROM MTP/IP 0/90 (figure 1)



Figure 1. Anterior and Lateral View Right Leg at first time arrival

On laboratories examination revealed an elevated CRP (26) and an elevated WBC (15,420). Meanwhile, On X-ray examination revealed suggestive osteomyelitis on the right tibial bone (figure 2) We decided to performed surgery in this patient, with vascularized fibular graft and ORIF PS ec Post Re-debridement, removed external fixation, immobilization with backslab ec acute exacerbation osteomyelitis right

distal tibia post debridement, sequestrectomy and external fixation and bone graft, culture and biopsy and Immobilization with backslab ec pathological fracture right tibia middle third ec chronic osteomyelitis right tibia Cierny Mader grade 3A, Post debridement, sequestrectomy and guttering. Remove external fixation and immobilization with backslab backup ORIF-PS



Figure 2. Anterior and Lateral View Xray of Right Leg.



Figure 3. Post Debridement and Sequestrectomy + Guttering



Figure 4. (A) Intraoperative, after plate was inserted anatomically (B) clinical picture after closed wound surgery.



Figure 5. Post operative X-ray evaluation revealed internal fixation was fixed on the right tibial bone.

DISCUSSION

In theoretically, The indications for vascularized bone transfers such as (1) immediate reconstruction for acute traumatic bone loss and osseous infection after severe open IIIB and IIIC fractures, (2) delayed free bone graft for posttraumatic osteomyelitis with long segmental bone loss and (3) repair of segmental bone defect after debridement and resection of infected bony tissue for treatment of chronic osteomyelitis.¹

VFF seems to be a valuable reconstructive technique for the treatment of osteomyelitis in tibial bone.² The indication for VFF is skeletal defect greater than 6 cm in length. Fibular osteocutaneous is the most commonly used as vascularized bone graft clinically. Vascularized bone can obliterate dead space, bridge large bone defects, enhance bone healing, resist infection by ensuring blood supply, allow early rehabilitation, and ensure better clinical outcomes in the treatment of lower extremity osteomyelitis.³ It reported success rates for microsurgical flap transfers for treatment of osteomyelitis range from 80% to 95%. Complications of surgery, including anastomosis failure, donor site problems, and fracture of the grafted bone, should be carefully avoided.⁴

CONCLUSION

In conclusion, this case describes a rare presentation of spontaneous osteomyelitis of the tibial bone. A vascularised bony

reconstruction with a VFF graft was performed. We have successfully reconstructed this patient (6 cm). The osseous unions occurred, and all of the grafted fibular bones eventually obtained good union. The donor site morbidity was negligible. After few months of follow-up, we conclude that this treatment protocol provides rapid recovery from osteomyelitis and that free vascularised fibular transfer is a good method for the management of infected long-bone defects.

Declaration by Authors

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

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How to cite this article: Agus Suarjaya Putra, Made Bramantya Karna, AA Gde Yuda Asmara. Vascularized fibular graft for non-union of tibial long bone with acute exacerbation osteomyelitis in pediatric patient: a case report. *Int J Health Sci Res.* 2024; 14(4):197-201. DOI: <https://doi.org/10.52403/ijhsr.20240429>
