



Open Dislocation of the High Ankle Joint After Fibular Graft Harvesting



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ARTICLE INFO

Level of Clinical Evidence: 4

Keywords:
ankle dislocation
carcinoma
complication
free bone graft
talus

ABSTRACT

The free microvascular fibula and soft tissue transfer has become a widely used method for reconstruction of different regions. Donor site morbidity for free fibula microvascular flaps has generally been reported to be low, or at least acceptable. We describe the case of a patient who underwent vascularized free fibula graft harvest for mandibular reconstruction. After 21 months, he had sustained an open dislocation of the left high ankle joint during recreational sports activity. We did not find such case in the published data.

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The fibula has been used as a free graft and as an autogenous vascularized transplant for the treatment of various conditions. These include reconstruction and bridging a large bony defect for conditions such as nonunion, congenital pseudoarthrosis of the tibia, bone loss after tumor resection and osteomyelitis, spinal surgery fusions, avascular necrosis of the femoral head, and many other indications (1–4).

The fibula free graft affords many advantages, including consistent vascular anatomy, the relative ease of harvest, and significant bone stock with excellent strength owing to the cortical bone present, and it has the potential for remodeling with loading. Compared with other microvascular flaps, the fibula offers the greatest bone length, a single vascular pedicle of sufficient length with large diameter vessels, and a rich periosteal blood supply (1,5–7).

The fibula free flap based on the peroneal artery and its veins lies medial to the fibula and posterior to the interosseous membrane. A skin flap can be included in the dissection. Approximately 25 cm of the diaphyseal portion of the fibula can be resected with a long peroneal artery and vein, leaving remnants of bone proximally and distally for joint stability (1,6,7).

The donor site morbidity for free fibula microvascular flaps has generally been reported to be low for most patients (4,8–11). However, several studies have found significant functional changes after partial fibulectomy. The immediate and long-term complications of

the free fibula graft donor site have included donor site wound healing complications, wound dehiscence and infection, tendon exposure, split-thickness skin graft loss, osteomyelitis, donor site pain, edema, hematoma, numbness of the foot, transient peroneal nerve palsy, compartment syndrome, hammertoe, ankle valgus deformity in children, limited maximum ambulatory distance, difficulties with fast walking, running, and walking stairs, gait change, tibial stress fracture, instability, and secondary ankle osteoarthritis (3,7,10,12–18).

We present the case of a patient who underwent vascularized free fibula graft harvest for mandible reconstruction. After 21 months, this patient experienced an open dislocation of the left high ankle joint. The patient's physical, intraoperative, and radiographic findings and treatment course are presented.

Case Report

A 41-year-old male was diagnosed with stage T4aN2b planocellular carcinoma of the left trigonum retromolare with mandible infiltration. He underwent surgical resection. The mandible was reconstructed using a vascularized fibular free flap without a skin paddle that was harvested from the left leg. The graft taken measured approximately 15 cm in length on the radiograph of the donor leg taken postoperatively. The length of the remaining distal part of the fibula bone was 8 cm. In the postoperative course, the patient was treated with radiotherapy and chemotherapy. He wore a protective brace and was without weightbearing for 2 weeks. The brace was removed after another 2 weeks. A few months later, he resumed his recreational sports activities.

Financial Disclosure: This study was supported by the Ministry of Education and Science of the Republic of Serbia (grant 175–095).

Conflict of Interest: None reported.

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Fig. 1. Open dislocation of talocrural joint.

At 21 months postoperatively, during a recreational soccer match, he stopped, tried to run, and then everted his left ankle, which led to open dislocation of the talocrural joint. No physical contact had occurred between the patient and other players, and it was not high-energy trauma. During the clinical examination, we found a large amount of swelling, apparent deformity, and a large transversal wound of the medial side of the ankle, with exposure of the articular surface of the distal tibia and medial malleolus (Fig. 1). Radiographs of the involved leg showed a disturbance of the ankle mortise and dislocation between the distal ends of the tibia and fibula (Fig. 2).

The wound was debrided, irrigated, and closed primarily using sutures. A broad-spectrum antibiotic was administered immediately before surgical treatment and continued for the next 10 days. Intraoperatively, we found an osteochondral fracture of the distal tibia, talus, and both malleoli that were not seen on radiographs. Closed reduction was performed, but the joint was unstable, and

trans-syndesmotic fixation and deltoid ligament repair were necessary (Fig. 3). We removed all detached pieces of bone and cartilage from the joint. A below-the-knee posterior molded splint was applied, which was removed daily for wound inspection. The culture for microbes was negative. After suture removal, a below-the-knee cast was applied. Immobilization was after 2 months (Fig. 4). This was then changed to a protective brace for another month. He was kept non-weightbearing for 3 months, when we removed the transfixation screw, and he was allowed full weightbearing (Fig. 5). One year after the injury, the patient was free of pain, with a full range of motion, and he returned to his daily and professional activities.

Discussion

Fibular grafting is not a common procedure in orthopedic practice; however, it has been used very often in plastic reconstructive surgery and microsurgery. It is important to examine the consequences of fibula resection for the donor site. Numerous studies have specifically considered the resultant donor site morbidity after free fibular grafting (3,4,6,9–11,16,17,19). However, according to Zimmermann et al (5), the follow-up intervals were often short, the study groups were small, or the study populations were very heterogeneous.

In general, the patient perception of donor site morbidity was low. The complications included pain (60%), dysesthesia (50%), a feeling of ankle instability (30%), and an inability to run (20%) (6).

In their study, Lee et al (20) included 10 adults after resection of a fibula. Of the 10 adults, 6 of them had no symptoms and 4 had some aching, weakness, or paresthesia. All knees and ankles were clinically and radiologically stable; however, but the distal fibular remnant was osteoporotic (20). Similar studies have supported a low morbidity rate at the donor site after free fibula graft harvest (4,9–11).

The question is how much the fibula graft harvest will influence the ankle stability and gait. The fibula has been shown to carry approximately 6% to 16% of the load applied to the leg during weightbearing (21–23). The weight on the fibula increased with dorsiflexion and eversion of the ankle joint (21). Skraba and Greenwald (23) tested 3 legs in vitro and founded that an intact



Fig. 2. (A) Preoperative anteroposterior radiograph. (B) Preoperative lateral radiograph.

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