A modification of the tibial bone-graft-harvesting technique


Abstract. A modified method of tibial bone-graft harvesting is presented. A hollow, cylindric, hand-driven instrument is used to harvest the graft at the medial slope of the tibial tuberosity. Satisfactory amounts of autogenous cancellous bone graft are available to bridge osteotomy gaps and facial fractures, fill smaller defects, and even obliterate a frontal sinus. There is minimal donor-site morbidity, and complications have not been seen in a series of nine consecutive patients.

In oral and craniomaxillofacial surgery, bone-grafting procedures are common. Various indications, donor sites, and techniques have been reported. The tibial plateau has seldom been recommended as a harvest site despite good accessibility and availability.

The reasons for this may be fear of epiphyseal and potential growth disturbances in growing patients; the expected quantity, quality, and fatty bone-marrow content of the graft; and, possibly, unawareness of the simplicity and low morbidity of the technique.

We would therefore like to report our experience with a modification of the tibial bone-graft-harvesting technique.

Fig. 1. Location of incision at medial slope of tibial tuberosity.

Fig. 2. Placement of Wagner instrument perpendicular to bony surface.

Fig. 3. Cancellous tibial bone rod of 5 cm (patient 5, Table 1).
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The table shows patients with anatomic ideal bone gaps.

**Discussion**

Signs of reaction, infection, necrosis, or signs of reaction, infection, necrosis, or loss of function are noted. The immediate postoperative period is noted for 24 hours. A 0- to 0° restoration in normal movement is noted. The patient is instructed to use a small masticatory muscle to avoid overloading the implant. This instruction is repeated periodically.

The patient is then placed on a diet plan (Fig. 2). The patient is instructed to refrain from smoking, which could cause complications.

The overlying soft tissues are reviewed (Fig. 3). Skin complications are discussed, and postoperative skin complications and issues are addressed.
When this instrument is used through the cancellous bone, easy insertion through the cancellous bone is achieved (Fig. 3). This can be felt quite easily and is marked by an increased resistance to insertion. Several roods of the opposite side is well"
acce\nt site, the type and amount of bone needed, and the characteristics of potential donor sites. When cancellous bone can be used, e.g., for bridging gaps in orthognathic surgery (patients 2, 6, 8, and 9), trauma (patients 3 and 5), or post-traumatic and oncologic reconstructive surgery (patients 1, 4, and 7), tibial grafts may be very suitable (Table 1). Particulate cancellous bone grafts do not have the mechanical strength desired for reconstruction of large defects without additional support. On the other hand, because of the large open areas in these grafts, (re)vascularization usually takes place rapidly, thereby bringing cellular regeneration, remodeling, and gradual substitution with new bone formation where old bone has disappeared 7,8,9,11,13.

The complication rates of tibial graft harvesting are reported to range from 1.3% to 3.8%, which compares favorably with the complication rate of iliac crest harvesting of 8.6%-9.2% 7,9. The nine patients of this series do not allow us to give a meaningful complication rate, although a complication rate of 0% is encouraging. The fact that the bone grafts tend to be oily did not cause any morbidity in the early follow-up period.

Because of possible growth-center interference, the use of the tibia as donor site is contraindicated in children and adolescents. In questionable situations (e.g., an 18-year-old man), preoperative radiographs should be made to verify closure of the epiphysial plates and cessation of growth.

This modified graft harvesting technique is simple, is not time-consuming, and produces reasonable amounts of cancellous bone with a simple, hand-driven instrument. Other techniques need drilling equipment, tourniquets, and osteotomes 4,8,13, and may cause weight-bearing limitations.

This modification allows weight bearing immediately postoperatively, needs neither a bloodless field nor drainage, and does not appear to cause complications or morbidly. The tibial plateau can be considered a suitable donor site for defined indications in bone-grafting procedures in oral and craniomaxillofacial surgery.

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References