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 epiphysial 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.
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<tr>
<th>Indication</th>
<th>Diagnosis</th>
<th>Sex</th>
<th>Age</th>
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<td>bridge nonunion fracture and bite contour</td>
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Table 1: Concomitants and additional mandible defects

The patient, the characteristics of the case, and the condition of the maxilla are the key factors in choosing the best site for removing the bone.

Discussion

Signs of infection, intracranial necrosis, or sepsis of the lesion, intracranial necrosis, or

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Results

We compared the number of patients who experienced complications to the number of patients who did not experience complications. The number of complications was lower for the technique described in this study.

Patients

Table 1: After harvesting of graft. (A) (lateral view; B)
The acceptor 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 onologic 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.2,3,10,11,12

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 epiphyseal 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 osteotomes4,9,13, 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 morbidity. The tibial plateau can be considered a suitable donor site for defined indications in bone-grafting procedures in oral and cranio-maxillofacial surgery.

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References