

## Technical note

# Proximal tibia—extensor mechanism composite allograft for revision TKA with chronic patellar tendon rupture

Robert L Barrack and Thomas Lyons

Tulane University School of Medicine, Department of Orthopaedic Surgery, 1430 Tulane Avenue, SL32, New Orleans, Louisiana, USA. Tel + 1 504 584 3514. E-mail: rbarrack@switchboard.net  
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**ABSTRACT** – Rupture of the patellar tendon following TKA is fortunately an uncommon complication with an incidence of 0.2–4% (Abril et al. 1995). Numerous options have been reported for treating this complication, including primary suture into a bone trough (Abril et al. 1995), autogenous tendon transfer (Cadambi and Engh 1992), and use of an artificial ligament (Fujikawa et al. 1994). Allograft patellar tendon has also been utilized either retaining the host patella and using a bone-tendon-bone graft or excising the host patella and using a quadriceps tendon-patella-patellar tendon-tibial tubercle graft (Emerson et al. 1990, Emerson et al. 1994, Zanotti et al. 1995, Booth et al. 1999). All of these techniques require structural integrity of the proximal tibia in the area of the tibial tubercle in order to attach the repair or graft to restore continuity of the extensor mechanism. When there is massive osteolysis and bone loss involving the proximal tibia, the situation becomes more complex and the previously described techniques are not advisable. In such cases, function can be obtained with a composite allograft of proximal tibia-patellar tendon-patella-quadriceps tendon. We describe a technique for dealing with this difficult clinical situation.

(Figure 2), a composite graft involving proximal tibia-patellar tendon-patella quadriceps tendon can be used. The composite graft can be prepared on the back table (Figure 3). We prefer cementing into the allograft bone with secure press-fit into the host tibial diaphysis. A rotating hinge is utilized, since all collateral ligament attachments are sacrificed. A cemented all-polyethylene patellar component is placed and the patient's patella is shelled out preserving the remaining retinaculum and extensor mechanism. Other authors have reported leaving the allograft patella unresurfaced (Leopold et al. 1999). Complications from resurfacing the allograft patella, however, have not been described, to our knowledge. The allograft quadriceps tendon is firmly sutured to the host



Figure 1. Chronic patellar tendon rupture, confirmed at surgery (see tip of instrument).

## Surgical technique

When a patient has a patellar tendon rupture following TKA, the bone in the proximal tibia should be carefully assessed (Figure 1). If osteolysis and bone loss involve most or all of the tibial tubercle

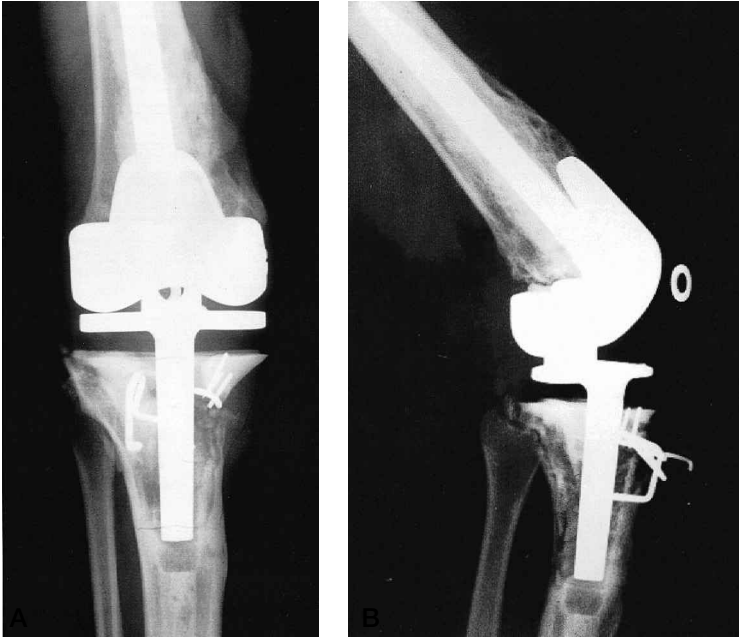


Figure 2. Preoperative anteroposterior (A) and lateral (B) radiographs show tibial component loosening, accompanied by extensive proximal tibial bone loss.

quadriceps tendon utilizing heavy nonabsorbable sutures (Figure 4). The repair is performed at 45° of flexion and should be under considerable ten-

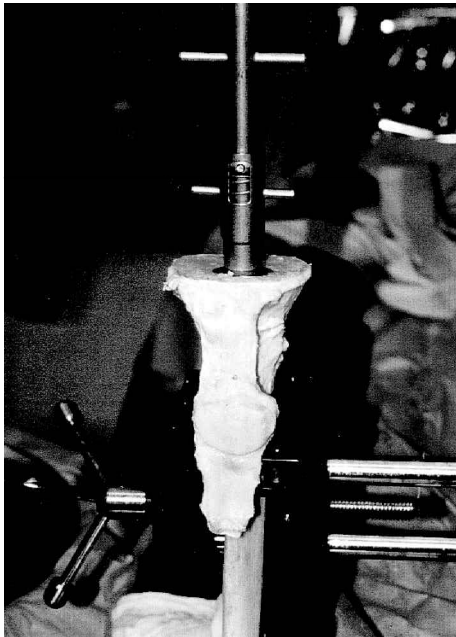


Figure 3. Proximal tibia-extensor mechanism composite allograft during tibial preparation.

sion at 60–70°, in order to avoid an extension lag. The remaining host extensor mechanism is then repaired over the top of the allograft to improve soft-tissue coverage.

Postoperatively, partial weight bearing with active flexion from 0 to 30 degrees is allowed initially, with active extension delayed for 6 weeks. Flexion is slowly increased and at 6 weeks postoperatively, active extension is initiated. A substantial extension-lag can be expected for 3–6 months, but this often resolves. Full weight-bearing is allowed after functional quadriceps control is attained,

which is normally at 4–6 months post-operatively. Union of the junction between the graft and the host tibia occurs slowly, probably taking 1 year or more (Figure 5). Full extension and functional range of flexion can be achieved with this technique (Figure 6) which we have performed successfully in 2 salvage revision TKA cases.

Abril J C, Alvarez L, Vallejo J C. Patellar tendon avulsion after total knee arthroplasty. A new technique. *J Arthroplasty* 1995; 10 (3): 275-8.

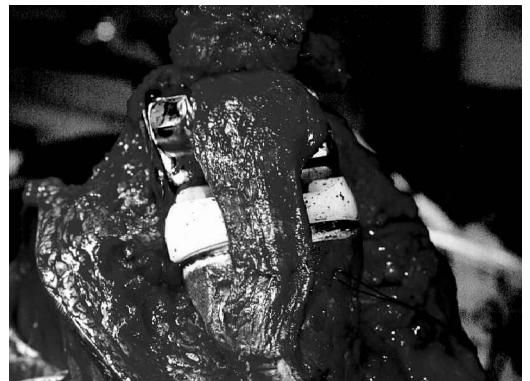


Figure 4. Rotating hinge components and composite allograft in place.



Figure 5. Anteroposterior (A) and lateral (B) radiographs showing a composite graft at the 3-year follow-up. Patient is ambulatory, without a cane, minimal symptoms and 0-90° arc of motion.

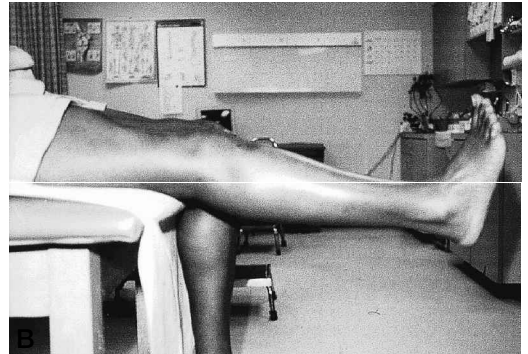


Figure 6. At the 3-year follow-up, clinical evaluation showed active extension (A) and flexion (B).

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