Anteromedial Tibial Tubercle Transfer

20

John P. Fulkerson

Contents

20.1 **Technique** 152
20.2 **Rehabilitation** 153
20.3 **Expectations** 153
References 153

Anteromedial tibial tubercle transfer (also called anteriorization of the tibial tubercle or AMZ) is most useful for unloading symptomatic patellofemoral articular lesions on the lateral and distal aspect of the patella while centering patella tracking [1]. The classic patient who benefits from anteromedial tibial tubercle transfer has Ficat's "excessive lateral pressure syndrome (ELPS) [2]." A patient who has had long-standing lateral tracking of the patella with overload of the lateral facet [2–7] generally breaks down the articular cartilage of the lateral patella and trochlear facets (Fig. 20.1), sometimes resulting in chronic pain. The typical pattern also breaks down distal patella articular damage as the patella courses from an abnormally lateral position in extension across the proximal lateral trochlea in early flexion, breaking down distal as well as lateral articular cartilage. Fortunately, the vast majority of patients with this aberration also are left with intact medial patella articular cartilage, particularly on the more proximal aspect of the medial patella.

Anteromedial tibial tubercle transfer may also be useful in patients with lateral patellar tracking who have damaged the distal patella medially as a result of relocation following patellar dislocation. An important prerequisite for success with anteromedial tibial tubercle transfer, however, is *intact* proximal medial patella articular cartilage. Anteromedial tibial tubercle transfer has also been useful in conjunction with patellofemoral resurfacing procedures.

J.P. Fulkerson, MD
Department of Othopedic Surgery,
Orthopedic Associates of Hartford, P.C.,
Clinical Professor of Orthopedic Surgery,
University of Connecticut Medical School,
499 Farmington Avenue, Suite 300,
Farmington, CT 06032, USA
e-mail: patelladoc@aol.com

A. Gobbi et al. (eds.), *The Patellofemoral Joint*,
DOI 10.1007/978-3-642-54965-6_20, © ISAKOS 2014

Fig. 20.1 Ideal patient for AMZ

20.1 Technique

Anteromedial tibial tubercle transfer requires an incision of 6–10 cm along the tibial crest, extending from 2 cm proximal to the tibial tubercle to a point 4–7 cm distal to the tibial tubercle. After identifying the patella tendon insertion into the tibial tuberosity, the tibialis anterior muscle is reflected laterally. Using retractors to expose the entire lateral tibia, an oblique osteotomy is created from the medial patellar tendon insertion, extending to a point at the anterior tibial crest about 5–7 cm distally, such that the osteotomy is tapered anteriorly to exit at the anterior tibial crest distally. The osteotomy is designed to be oblique such that when the tibial tuberosity is moved, it will slide across the osteotomy plane both anteriorly and medially. The average osteotomy moves approximately 1 cm medially and 1 cm anteriorly. The tubercle may be moved slightly distally also to correct patella alta as needed (8) but this is usually not necessary or advised. To do this, some distal bone pedicle must be removed. *Most important in creating this oblique osteotomy is to watch the cutting blade laterally at the lateral tibia from distal to proximal.* The cut should be made through the distal aspect of the osteotomy first and then saw blade observed continuously as the blade moves proximally and posteriorly. The blade should never be out of the surgeon's direct vision, as the deep peroneal nerve and the anterior tibial artery are just behind the posterolateral tibia at this level.

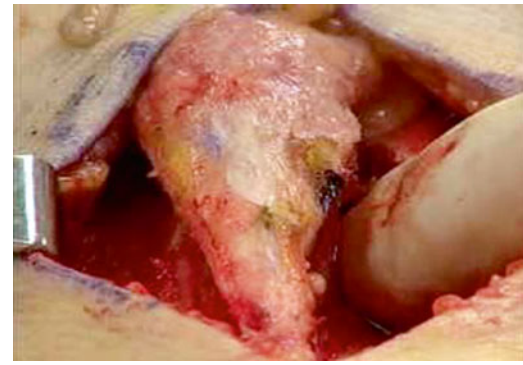

Fig. 20.2 Anteromedial tibial tubercle transfer before screw fixation. Note anterior taper at distal end and full exposure of lateral tibia

To complete the osteotomy, an oblique cut is made on the lateral tibia from the most proximal lateral aspect of the osteotomy just above the patellar tendon. A third cut is then required to cut across the top of the osteotomy above the patellar tendon insertion to connect it to the starting point at the proximal medial tibial cortex just medial. After breaking loose the osteotomy shingle that has been created, it is shifted anteromedially (Fig. 20.2) and secured in its new location with two cortical screws into the posterior tibial cortex. After this is completed, lateral infrapatella releasing is done as needed to mobilize the patella, or the lateral release may be done preliminarily when necessary to relieve tilt, excessive tightness, or infrapatellar scarring. (Anteromedial tibial tubercle transfer is very helpful in many patients with infrapatellar contracture associated

with excessive lateral pressure syndrome, as this osteotomy distracts any released infrapatellar contracture).

20.2 Rehabilitation

Following anteromedial tibial tubercle transfer, the patient should begin range of motion exercises as soon as the immediate surgical pain has abated. The patient should bend the knee once a day for the first 2–3 weeks, achieving 90° of knee flexion by 2 weeks following surgery. The patient should use crutches and protected weight bearing for 6 weeks following which the patient goes to physical therapy for further motion and strength exercises as well as weight bearing and progression off of crutches, usually by 8 weeks post-op.

20.3 Expectations

For properly selected patients, this procedure yields good and excellent results [1–9]. It is the best alternative to patellofemoral replacement particularly in younger patients with ELPS and for patients with lateral patella instability when the surgeon documents lateral patella tracking/overload and a need for patella medialization with unloading of the distal and lateral aspects of the patellofemoral joint.

References

1. Fulkerson JP, Becker GJ, Meaney JA, Miranda M, Folcik MA. Anteromedial tibial tubercle transfer without bone graft. Am J Sports Med. 1990;18(5):490–6.
2. Ficat P. The syndrome of lateral hyperpressure of the patella. Acta Orthop Belg. 1978;44(1):65–76.
3. Karamehmetoğlu M, Oztürkmen Y, Azboy I, Caniklioğlu M. Fulkerson osteotomy for the treatment of chronic patellofemoral malalignment. Acta Orthop Traumatol Turc. 2007;41(1):21–30.
4. Lin ZJ, Wu ZQ, Gao DW, Wu YF. Micro-modified Fulkerson osteotomy for the treatment of habituation patellar dislocation. Zhongguo Gu Shang. 2009;22(7):513–4.
5. Post WR, Fulkerson JP. Distal realignment of the patellofemoral joint. Indications, effects, results, and recommendations. Orthop Clin North Am. 1992;23(4):631–43. Review.
6. Farr J, Schepsis A, Cole B, Fulkerson J, Lewis P. Anteromedialization: review and technique. J Knee Surg. 2007;20(2):120–8. Review.
7. Cameron HU, Huffer B, Cameron GM. Anteromedial displacement of the tibial tubercle for patellofemoral arthralgia. Can J Surg. 1986;29(6):456–8.
8. Tjoumakaris FP, Forsythe B, Bradley JP. Patellofemoral instability in athletes: treatment via modified Fulkerson osteotomy and lateral release. Am J Sports Med. 2010;38(5):992–9.
9. Akgun U, Naran R, Karahan. Modified Fulkerzon osteotomy in recurrent patellofemoral dislocations. Acta Orthop Traumatol Turc. 2010;44(1):27–35.