



Deepening Trochleoplasty in Patellar Dislocation: Thick-Flap Technique

Simon Donell, BSc, FRCS (Orth), MD, and Iain McNamara, MRCP, FRCS (T&O), MD

Deepening trochleoplasty is a technically demanding operation that is rarely required for most of the patients presenting with recurrent dislocation of the patella. However, in the presence of significant trochlear dysplasia, standard extensor mechanism realignment techniques can fail. A deepening trochleoplasty using a thick osteochondral flap technique is a logical solution for severe dysplasia and does not rely on the presence of normal articular cartilage in the trochlea. Satisfactory outcomes, including returning to sports for those who actively participate is usual. Theoretical complications such as chondrolysis and progression of patellofemoral osteoarthritis have not been found. This article describes the step-by-step operative technique with illustrations. *Oper Tech Sports Med* 23:129-135 © 2015 Elsevier Inc. All rights reserved.

KEYWORDS trochleoplasty, surgical technique, patellar dislocation

Introduction

Trochlear dysplasia, where the distal femur has failed to develop a groove to act as a pulley for the extensor mechanism, is now recognized as an important anatomical abnormality in patients with dislocation of the patella. Over the last 2 decades, the operation of trochleoplasty to correct this abnormality has been developed. Trochleoplasty was first described by Albee¹ in 1915 where the lateral trochlear facet was elevated. This operation has value in those patients with lateral condylar hypoplasia, but results in pain and progression to osteoarthritis where the abnormality is secondary to hyperplasia of the distal femur. In the late 1980s, Dejour from Lyon in France developed a deepening trochleoplasty where the subchondral bone is removed using a burr mounted on a feeler gauge.^{2,3} The osteochondral flap is then divided with an osteotome, depressed and held with staples. A flexible thin flap technique has also been developed by Bereiter,^{4,5} but this requires normal articular cartilage. In the operation reported here, a modification of the Dejour operation⁶; 2 thick triangular osteochondral flaps are formed, subsequently depressed and held by sutures.

Classification of the dysplasia has been reported by Dejour et al⁷ based on the lateral x-ray, and by his son, David, on computed tomography and magnetic resonance imaging (MRI) scan.⁸ The simplest method is the lateral x-ray. Dejour defined 3 types (I-III), but these have a poor interobserver correlation.⁹ It is easier to define a mild and severe type, where mild is subtle and severe obvious. Although Dejour defined severe dysplasia as a boss height (Fig. 1) of 6 mm (using his method of calculation), a girl of 152 cm (5 ft) with a boss height of 3 mm has a more severe dysplasia than a young man of 198 cm (6 ft 6 in) with a boss height of 6 mm. If a patient presents with a failed patellar stabilization procedure that has been performed correctly, then a boss height of 3 mm may be worth correcting (Fig. 2).

Indications and Contraindications

Problems with the extensor mechanism of the knee present on a spectrum from patellar dislocation through subluxation to anterior knee pain. The more pain a patient has, the less likely a good operative result will occur. The ideal patient is the one who has just reached postpuberty age, has a normal body mass index, has no hypermobility, normal lower limb rotational profile, plays regular sports, only has intermittent dislocations with an otherwise normal functioning knee, and lives locally. The farther an individual patient moves from the ideal, the more caution is needed about the benefits of an operation. Improved outcomes can be achieved in an overweight patient

Department of Orthopaedics, Norfolk and Norwich University Hospital, Norwich, Norfolk, UK.

Address reprint requests to Simon Donell, BSc, FRCS (Orth), MD, Department of Orthopaedics, Norfolk and Norwich University Hospital, Colney Lane, Colney, Norwich, Norfolk NR4 7UY, UK. E-mail: simon.donell@nnuh.nhs.uk

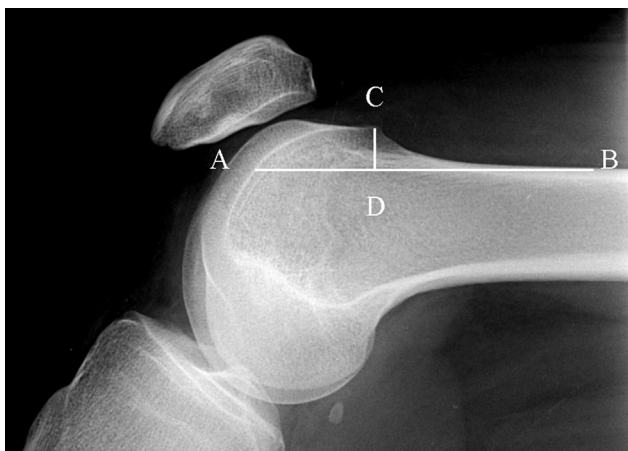


Figure 1 Lateral x-ray of the knee showing the extension of the anterior femoral cortical line (AB), the boss height (CD), and the trochlear groove line (AC).

with continuous knee pain who is wheelchair bound, and has had multiple previous unsuccessful stabilizations, but such patients must be highly motivated through recovery. Patients can expect to gain ability to walk unaided and manage stairs without a hand rail, although it is unlikely that they will squat, kneel, or play sports.

In general, trochleoplasty works best when performed as the first stabilization procedure. The decision to undergo a trochleoplasty depends on the circumstances of the patient, and not just on a measurement from an image. A trochleoplasty requires an inpatient stay of 2-days, with prolonged rehabilitation typically of 3-6 months.

Patients with hypermobility syndrome and a mild dysplasia can be managed with a medial patellofemoral ligament reconstruction, as the elastic ligaments lead to a lower patellofemoral joint reaction force than normal ligaments. In hypermobile patients it is essential to avoid a lateral release as part of the patellar stabilization procedure.

Preoperative Planning

Most of the patients with patellar instability, including those with significant trochlear dysplasia, are satisfactorily managed with conservative therapy. Should the patella remain unstable after a course of appropriate physiotherapy, then an operative intervention should be considered. In the research sphere, MRI or computed tomography scans including dynamic MRI scans are advocated.¹⁰ For ordinary clinical practice, plain x-rays are adequate to define the dysplasia, but should prompt referral to an expert in the technique. The history, examination, and plain x-rays confirm the diagnosis and define the management. Apart from the standard general preoperative checks and work-up, no specific tests or image planning is needed.

Technique

The operation is usually performed with the patient supine after administering prophylactic antibiotics and under a

combined general and epidural anesthetic, with the epidural catheter left in situ for postoperative analgesia. The knee is held at 90° flexion using appropriate supports. The knee is examined under general anesthetic to demonstrate patellar dislocation and the ease with which the patella can be placed in the proposed new groove. Difficulty in achieving this suggests extensor mechanism procedures in addition to the trochleoplasty will be needed. The limb is exsanguinated after a padded tourniquet is applied.

A standard medial parapatellar approach is used with the skin incision started proximally in the midline over the quadriceps tendon and taken straight distally to the tibiofemoral joint line just medial to the tibial tubercle. The incision can be extended distally if a tibial tubercle osteotomy is required. By avoiding an incision over the tubercle there is a greater chance that the patient can subsequently kneel. The incision is deepened through the medial retinaculum and the patella everted. The knee should be inspected for loose bodies, and the notch inspected and expanded if osteophytes are present, to avoid impingement on the anterior cruciate ligament.

Deepening Trochleoplasty

The distal femur is exposed and the proposed fold lines marked with a pen. A new groove will be formed by removing the excess subchondral bone proximally in a rhomboid-shaped trench (Fig. 3). The distal corner (A) is the roof of the notch. The lateral fold line is AB and is defined by locating the highest lateral point on the anterior surface of the distal femoral articular cartilage. The line AB is drawn as the extension from A through the highest lateral point to B (junction of articular cartilage and periosteum). The medial fold line (AC) is drawn as transversely as possible. The new groove will run along a line AD. The medial triangular flap (ACD) will be depressed and the more transverse the fold line AC (the greater the angle β), the greater the posterior displacement. This is important as it avoids incongruity between the patella and the new groove. The lateral triangular flap (ABD)

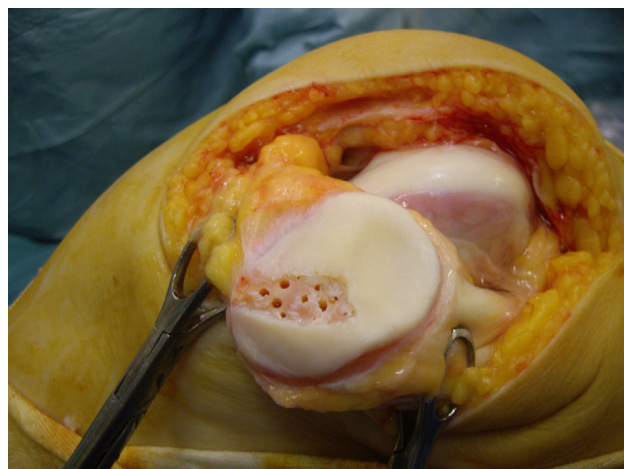


Figure 2 Intraoperative photograph showing patellar after excision of damaged articular cartilage and microfracture. (Color version of figure is available online.)

Download English Version:

<https://daneshyari.com/en/article/4079482>

Download Persian Version:

<https://daneshyari.com/article/4079482>

[Daneshyari.com](https://daneshyari.com)