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Medial dislocation of the patella

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Abstract. Medial dislocation of the patella is a previously unreported entity. This disorder can be disabling to the patient and may require a hospital visit for reduction. Three cases are presented in this article in which computed tomography demonstrated the dislocation. All three patients had undergone a lateral retinacular release to the involved knee for treatment of chronic knee pain or recurrent lateral patellar subluxation.

Key words: Knee – Abnormalities, knee – Computed tomography

Introduction

Lateral subluxation and lateral dislocation of the patella are well-recognized orthopedic disorders of the knee joint that frequently cause disability [3, 4]. Both open and arthroscopic lateral retinacular release are popular surgical procedures used in the treatment of these and other conditions producing patellofemoral pain. Hughston and Deese have described medial subluxation of the patella as a late complication of arthroscopic lateral release [5]. A literature search revealed no previous reports of medial dislocation of the patella. This report presents three cases in which computed tomography (CT) or double contrast arthrography with computed tomography (DCCT) document frank medial dislocation of the patella.

Patients

Case 1

A 26-year-old woman (Fig. 1) sustained an acute lateral dislocation of the left patella 1 year before presentation. She had no prior history of patellofemoral compartment difficulty. After reduction of the dislocation she was treated by immobilization, but lateral dislocation recurred. Arthroscopy was performed followed by patellar realignment, including medial plication and transfer of the tibial tubercle. The patient subsequently dislocated the patella laterally while in a cast. Thereafter, she repeatedly dislocated the patella laterally. She underwent another surgical procedure in which more of the lateral half of the patellar tendon was attached to the medial tibial plateau with a metallic cancellous screw. A lateral retinacular release 5 cm above the patella was also performed at that time. The patella began spontaneously to dislocate medially after cast removal. At presentation the left patella dislocated or subluxated medially almost hourly. Two or three times daily the patient had to reduce the patella manually. Because of this instability she used crutches more than 50% of each day. The left thigh was atrophied as compared with the right with a girth of 41 cm (16.5 in.) as compared with 45 cm (18 in.).

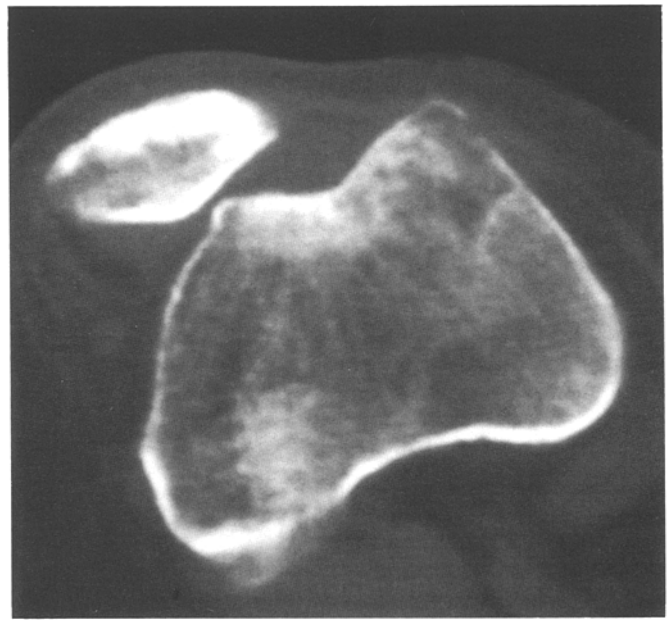

Fig. 1. Computed tomography (CT) scan of this 26-year-old patient demonstrates frank medial dislocation of patella

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Fig. 2. Double contrast arthrography with CT of a 21-year-old man with previous lateral retinacular release demonstrates frank medial dislocation of the patella. Note that the patellar articular cartilage is normal

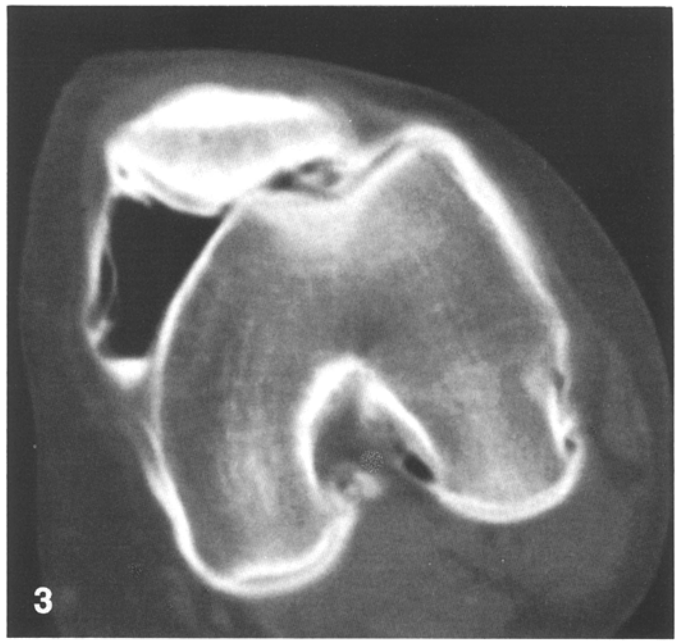

Fig. 3. A 26-year-old woman with frank medial dislocation of the patella seen with DCCT. Note the complete loss of articular cartilage from the lateral facet of the patella and the shallow trochlear groove

Case 2

This patient was a 21-year-old man (Fig. 2) seen 2 years after a motor vehicle accident in which he injured his left knee. He has undergone nine surgical procedures for anterior knee pain; the knee deteriorated dramatically after lateral retinacular release. After this procedure the patient could medially dislocate the patella. At presentation he was unable to walk up stairs or participate in sports activities. Left thigh atrophy was present. The left thigh measured 50 cm (20 in.), the right 55 cm (22 in.).

Case 3

A 26-year-old woman (Fig. 3) was in good condition until 1983 when she sustained a left knee injury. She received injections of unknown nature during a period of several months. In 1985, she underwent diagnostic arthroscopy with subcutaneous lateral retinacular release and shaving of the patellar articular cartilage due to persistent pain. Within 3 months she underwent a second diagnostic arthroscopy with additional shaving of articular cartilage from the medial facet of the patella, and a lateral retinacular release was again performed. After this operation she remained disabled and developed recurring medial dislocation of the patella, which occurred at least four times. On two occasions hospital visits were required for reduction. Left thigh girth measured 40 cm (16 in.) as compared with 45 cm (18 in.) for the right. Also noted was the presence of patella alta and a shallow trochlear groove of the patella.

Discussion

Hughston and Deese [5] reported on 30 patients with medial subluxation of the patella. We have evaluated approximately 25 patients for medial subluxation of the patella either with CT or DCCT. Three patients were able to dislocate the affected patella medially at the time of imaging and to reduce these dislocations before leaving the Radiology Department. Hughston and Deese [5] reported that early movement of the knee joint after lateral release may result in retraction and atrophy of the vastus lateralis tendon and muscle. These authors published a CT image of thigh atrophy. The three patients in the present report all demonstrated clinical atrophy of the distal thigh. No images of medial displacement or dislocation of the patella have been published in the medical literature.

According to Hughston and Deese the loss of the extensor mechanism provided by the vastus lateralis may produce unbalanced muscle forces on the patella and subsequent medial subluxation [5]. The same hypothesis of altered biomechanics can explain medial dislocation of the patella. Case 3 also presented with patella alta and a shallow trochlear groove in the distal femur. These may be additional predisposing factors. There are surgical measures which can be expected to decrease the incidence of medial dislocation and subluxation, namely incomplete incision of the vastus lateralis muscle and the suturing of the vastus lateralis to the quadriceps tendon more proximally. These measures may avert total loss of lateral stabilization resulting from complete vastus lateralis incision as well as maintain biomechanical balance of muscular forces on the patella.

Medial dislocation of the patella was demonstrated by CT or DCCT performed on the three patients in this report. Both of these techniques can accurately evaluate the patellofemoral compartment [1, 6]. DCCT is

utilized in the diagnosis of chondromalacia patellae and osteochondral lesions. Both methods can detect dysplasia of the trochlear groove and/or patella, as well as post-traumatic and degenerative osseous abnormalities. Figure 3 demonstrates the efficacy of DCCT. There is marked loss of lateral patellar articular cartilage as a result of recurrent medial dislocation and subluxation. A hypoplastic, shallow trochlear groove is also demonstrated.

After lateral retinacular release and anteromedial transfer of the anterior tibial tubercle, comparison of Merchant's congruence angle and Laurin's patella angle measured from CT scans can determine whether surgery improved abnormal patellar subluxation or tilt [2]. Our in-department protocol also utilizes axial CT for rotational analysis of the lower extremity to measure femoral anteversion, tibial torsion, external rotation of the knee, and external torsion of the leg. These CT measurements are useful when rotational osteotomy is contemplated as part of the surgical correction of medial patellar subluxation or dislocation.

DCCT with or without rotational analysis has become our standard imaging examination for patients with either medial or lateral displacement of the patella. The points we want to make to skeletal radiologists are:

1. Medial dislocation of the patella is a potential complication to lateral retinacular release, and
2. CT and double contrast arthrography with CT are valuable in assessing the patellofemoral compartment of the knee joint.

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