18 Fractures of the Patella

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18.1 Introduction

The patella is a sesamoid bone that develops within the tendon of the quadriceps muscle. Any fracture that results in displacement of the fragments in the longitudinal axis represents a disruption of the quadriceps mechanism.

18.2 Methods of Evaluation and Guides to Treatment

Just as one cannot expect a return of function in the hand without repair of a ruptured flexor tendon, one cannot expect a return of function of the quadriceps mechanism if the displaced fracture of the patella is left unreduced. Loss of quadriceps function means loss of active extension of the knee and loss of the ability to lock the knee in extension. Individuals with such lesions can neither walk on the level without the knee being unstable and buckling, nor can they walk upstairs or downstairs or on inclined planes. The disability is profound. Thus, the indication for open reduction and internal fixation of the patella is any fracture that leaves the quadriceps mechanism disrupted. The patella is intimately bound to the quadriceps tendon proximally, to the infrapatellar tendon distally, and on either side to the retinacular expansions that are adherent to the capsule. We have come to differentiate three groups of fractures of the patella, each requiring different treatment.

18.3 Classification

18.3.1 Osteochondral Fractures

Osteochondral fractures of the patella (Fig. 18.1), which usually involve varying portions of the medial facet and subjacent bone, are the result of patellar dislocation. Surgery is required to remove the intra-articular loose body and repair the quadriceps mechanism to prevent recurrences of the dislocation. In this injury, the extensor mechanism as such is not interfered with. This fracture may only be visualized in the «skyline» radiographic projection of the knee as on CT and therefore is frequently missed in routine radiographs of the knee. One must therefore remember that if a dislocation of the patella is suspected, one must obtain a skyline view of the patella in addition to the routine views of the knee.

Fig. 18.1. Osteochondral fracture of the medial facet sustained in a lateral dislocation of the patella. This fracture is usually not visible on an anteroposterior or lateral radiograph of the knee, and must be looked for on a "skyline" view of the patella.

18.3.2 Stellate Fractures

A stellate, undisplaced fracture of the patella (Fig. 18.2), or a vertical fracture, is usually the result of a direct blow to the patella. The continuity of the quadriceps mechanism is undisturbed and the retinacula are not torn. The fracture is stable and will not displace under the normal physiologic stresses of active motion. Surgery is unnecessary.
18.3 Classification

18.3.3 Transverse Fractures

A sudden, violent contraction of the quadriceps muscle, such as might occur when an individual stumbles and tries to stop the fall, may disrupt the quadriceps mechanism. Thus, there may be an avulsion of the quadriceps tendon, or of the infrapatellar tendon, or there may be a transverse fracture of the patella, together with a tear into the retinacular expansion (Fig. 18.3).

18.3.4 Multifragmentary Displaced Fractures

These are usually the result of a high-energy force, frequently seen in victims of motor vehicle accidents, and are not infrequently associated with fractures of the femur. They are the result of a combination of forces such as direct blows to the patella combined with displacing forces that rip the patella apart. Because of the compressive force across the patellofemoral articulation, as in the complex olecranon fractures, we frequently find in the patella separate fragments of the articulation that are displaced and may be impacted into the underlying bone. These must be recognized and reduced in addition to the reduction and fixation of the major fragments. To leave them displaced is to accept an incongruous articular surface that will predispose the knee to posttraumatic arthritis.

18.4 Surgical Treatment

We shall concern ourselves here only with disruptions of the extensor mechanism.

18.4.1 Undisplaced Fractures

A transverse, undisplaced fracture of the patella is an avulsion fracture. The function of the quadriceps mechanism is not disrupted, and the patient is able to maintain the knee extended because the retinacula on either side of the patella are not torn. However, the fracture is potentially hazardous because, with further sudden strong contractions of the quadriceps, the retinacular expansions might tear. The fracture will displace and the quadriceps function will be disrupted. The knee requires simple protection. Excellent results have been achieved by allowing motion, but keeping the patient on crutches, and also by immobilizing the knee in a cylinder cast and allowing weight bearing.

18.4.2 Displaced Fractures

A transverse fracture, either simple or comminuted, has, as an integral part, an associated disruption of