CASE REPORT

Horizontal intra-articular dislocation of patella with ipsilateral closed diaphyseal fracture of femur—a case report

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Accepted 19 April 2004

Case report

A 28-year-old female was brought to the Accident and Emergency Department following a fall off a Quad motorbike. She was thrown to the ground with the vehicle pinning her down. On initial evaluation, she was conscious, haemodynamically stable and found to have no life threatening injuries. A 5 cm laceration was seen over the anterior aspect of the knee. The thigh and knee were swollen and no deformity over the knee to suggest a patella dislocation. Secondary survey and radiological examination showed a mid-shaft fracture of the left femur and a horizontal intra-articular dislocation of the left patella. The patella lay horizontally, wedged within the knee joint, the articular surface facing distally. The knee X-ray showed evidence of air in the subcutaneous plane but not within the joint space (Fig. 1).

Treatment

Under general anaesthesia the femoral shaft fracture was first stabilised with a locked intra-medullary nail. Exploration of the knee wound showed avulsion of the quadriceps tendon as an intact sleeve from the superior pole and up to the middle third of the anterior surface of the patella. Attempts at closed reduction of the patella proved unsuccessful. This necessitated extending the knee wound and soft tissue release of the patella to allow reduction. The quadriceps tendon was reattached with sutures through drill holes in the patella. A cylinder cast was applied to immobilise the knee in extension. Post-operative mobilisation was allowed with weight bearing as tolerated. The cast was removed after 6 weeks and mobilisation commenced.

Discussion

Dislocation of the patella is not an uncommon injury, lateral dislocation being the commonest variety. Medial displacement is uncommon and intra-articular dislocation being a rare occurrence. The earliest reports of intra-articular type of patella dislocations have been attributed to Cooper and Midelfart. Since then a number of reports have sporadically been published in literature, indicating the uncommon nature of this type of patella dislocation.

Two types of intra-articular dislocation have been described. A horizontal type where the patella has rotated on its horizontal axis with the articular surfaces either facing proximally or distally. In the second type, the patella rotates on its vertical axis and the articular surface either faces medially or laterally. An unusual occurrence reported by Garrison and McCabe showed...
the patella simultaneously rotated on its horizontal and vertical axes. These injuries have been described mostly in adolescent boys or young males sustaining blunt trauma in a fall or during sports. Occurrences in older age groups and dislocations without any clear mechanism of injury have been reported. Garner et al. reported one case on intra-articular dislocation seen in an elderly arthritic knee. Presentation of these injuries is commonly with the knee in flexion or in extension. Closed reduction with sedation is never successful and general anaesthesia is required. There have been reports of successful closed reduction under general anaesthesia, but the majority of these injuries require open reduction. Brady and Russell, in their report and review of cases have recommended open reduction for such cases as the primary procedure.

The mechanism causing this type of dislocation has been described as a combination of forces acting on the patella. The initial blow on a flexed knee causes the patella to displace into the intercondylar notch of femur, since the upper pole of patella lies at this level when the knee is in flexion, and probably locking it in this position. But it is the recoil contraction of the quadriceps muscle that initiates the stripping of the quadriceps tendon from the upper pole of patella. The continuing contraction of the quadriceps muscle causes further tendon stripping from the anterior surface of patella and rotation on the transverse axis, thus coming to its final horizontal position, locked within the intercondylar notch of femur.

Quadriceps tendon avulsion is the more common finding, but patella tendon tears have also been reported. Post-operative immobilisation is in a cylinder cast or soft bandage for 4–6 weeks with weight bearing allowed as tolerated. Subsequent mobilisation and strengthening exercises is started after cast removal. In the previous case reports, subsequent follow-up of these injuries showed full recovery.

The case that we report is unusual, in that, the injury occurred in a young adult female and the mechanism involved a vehicular accident rather than blunt trauma or sporting injury as previously reported. A concomitant injury in the ipsilateral femur, as in this case, may at first deflect the attention away from the patella dislocation. Treatment of this rare injury requires open reduction under general anaesthesia, rather than on-site or emergency room reduction with sedation.

References