

Traumatic bilateral patellar fractures: A rare occurrence

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Abstract

Patellar fractures are of uncommon occurrence in the setting of trauma, accounting for only about 1% of fractures. Patellar fractures are most commonly encountered in the presence of underlying co-morbidities such as hyperparathyroidism, chronic renal failure and osteoporosis etc. Spontaneous isolated traumatic patellar fractures are very rare. This is one such case report of a 52-year-old female with no known co-morbidities presented with painful restriction of bilateral knees following head on collision by a car. On evaluation she was diagnosed with bilateral isolated patellar fractures. She underwent Open reduction and Internal Fixation + Tension band wiring for bilateral patellar fractures, which is considered the procedure of choice for such injuries, unless it is a comminuted fracture. Post-operatively she was mobilized and discharged. Hence we conclude with this case report - isolated bilateral patellar fractures secondary to trauma are a very rare entity and the surgical planning depends primarily on the fracture pattern. With adequate correction, post-operative morbidity and deformity is expected to be minimal.

Keywords: Bilateral patellar fractures, Isolated, Traumatic.

Introduction

Patellar fractures are a rare entity, accounting for 1% of all fractures, with bilateral fractures found in 2.9% of all patellar lesions. This is predominantly because of the location of the patella; anteriorly placed. Hence, this makes the patella vulnerable to direct impact injuries; very rarely indirect due to fall from a distance or fall from height. Usually patellar fractures, especially resulting from direct injuries, often have associated hip dislocation, fractures of the same side shaft/neck of femur or tibia. Patellar fractures are often seen in individuals between the ages of 20-50 years.¹⁻³ Isolated patellar fractures secondary to trauma are rare and underlying co-morbidities such as hyperparathyroidism, chronic renal failure and osteoporosis etc.

Very few cases have been reported where there is spontaneous bilateral traumatic patellar fractures.^{4,5} Here we describe a case of a middle aged female with no associated co-morbidities presenting with isolated bilateral patellar fractures.

Case Report

A 52 year old woman presented to orthopaedic emergency department following road traffic accident where she allegedly sustained a head on collision by a car. She presented with painful restriction of movements of both knee joints. There was associated history of pain and swelling of the left ankle joint, and associated history of head injury with no loss of consciousness, altered sensorium, seizures or vomiting. Patient had no associated co morbidities or no past history of fractures following trivial trauma. On evaluation, patient was found to have tenderness and crepitus over left knee joint associated with restriction of bilateral knee joint movements. There was also associated tenderness of the left ankle joint. Patient also had associated head injury with a 2 x 4 cm laceration of the forehead, 2 cm above the left supra-orbital ridge. Rest of the

systemic examination was found to be normal, with no trauma related injury to abdomen, thorax of any other part of the musculoskeletal system. X-ray of bilateral knee joints showed transverse undisplaced fractures of bilateral patella (Fig. 1).



Fig. 1

X-rays of the pelvis, femur, ankle and spine was ordered to rule out any possible associated fractures, and was found to be within normal limits. Patient was hence taken up for surgery for the isolated bilateral patellar fractures.

The patient was made to lie in supine position, following which a tourniquet was secured on the proximal thigh after administration of spinal anaesthesia. Ventral

midline incision was made over the right patellar surface anteriorly. The quadriceps and patellar tendon was then exposed. Fracture site identified and reduced using patella reduction clamps. The articular reduction was assessed by checking the posterior surface of the patella for any slip off. Once the reduction was deemed adequate, 2 Kirschner wires were drilled through the proximal and distal fragments of the patella fracture. Stainless Steel wires were then looped around the Kirschner wire to achieve a figure of 8 patterns. The two ends of the wires were brought out through the patellar surface anteriorly, ends twisted to tighten. Once the reduction was adequate (checked intra-operatively with the help of the C-arm) and fracture fragments approximated, the incision over the patella was closed in layers after carefully securing a drain. Similar approach was followed on the left side, making sure that any clots and debris that might be present was cleared prior to reduction of the fracture fragments. For both lower limbs, flexion and extension of the knee joint was evaluated prior to closing the incision. Cylindrical cast was applied with both knees maintained in complete extension. Post-operative period was uneventful, except for minimal pain at the operative site.

Post op check X-rays were ordered, which showed adequate reduction of the fracture (Fig. 2). Patient was then mobilised on post-operative day 2 with partial weight bearing on the knees with the assistance of crutches. On post-operative day 5, she was discharged with knee brace support in place. Prior to discharge, she was taught gentle knee flexion exercises (active and gravity aided).

Patient came for follow up on POD 10, during which time sutures were removed and at 3 weeks, patient was instructed to initiate hamstrings and quadriceps exercises for strengthening. At the end of 3 months, patient was found to have full range of flexion and extension of bilateral knees without any pain or stiffness.



Fig. 2

Discussion

Patella is a triangular structure, the largest sesamoid bone in the body, formed within the quadriceps femoris tendon and tensor fascia lata fibres. Patellar fractures, especially isolated, are fairly uncommon injuries, with the mode of injury being direct or indirect trauma.^{1,2} The patella is placed anteriorly in the subcutaneous plane, making it liable to injury through direct trauma following road traffic accidents involving fall or dashboard injuries. Indirect patellar fractures occur as a result of violent Quadriceps Femoris muscles contraction, especially with the knee is in flexion. With patellar fractures, the extensor movements of the knee are impaired, and the articular surface approximation of the femoral condyles with the patella is disrupted. In most of the cases of reported patellar fractures, it is seen secondary to underlying hyperparathyroidism, chronic renal failure or osteoporosis, where the bones are liable to fractures following trivial trauma.

In our case report, we present a case of a middle aged woman with no underlying co-morbidities, with a diagnosis of bilateral patellar fracture following direct trauma. Bilateral isolated patellar fractures are very rare in occurrence, with an incidence of less than 2.9% of all patellar lesions. Research indicates that patellar fractures are more common in men, with a 2:1 male to female ratio. Most of the patella fractures are closed injuries, with less than 7% of fractures representing open fractures.⁶

Fractures of the patella are classified based on the type fracture line as vertical, transverse, marginal comminuted, or osteochondral. Transverse fractures occur as a result indirect injury to the patella (i.e. falls). Vertical fractures are often stable fractures; conservative line of management can be attempted in such cases. Patellar fracture is considered non-displaced if the fragment displacement is less than 3 mm.⁷ Other classification is by the AO group, where it is divided as extra-articular, partial articular and complete articular.^{8,9}

The aim of surgery for patellar fractures would be to retain or restore the articulating surface, preserve the extensor movements of the knee joint while preventing joint stiffness and contractures. Because of its location and its function in the knee extensor mechanism, fixation of patellar fractures often poses a surgical challenge. There are few instances where conservative management can be attempted for patella fractures such as fragment displacement less than 2 mm, intact articular surfaces and extensor mechanism; however the associated complication of impaired knee extensor mechanism and stiffness is much higher. Operative management is recommended for cases with more than 2 mm displacement of articular segments or 3 mm fragment separation, osteochondral and comminuted fractures with or without articular displacement.

As in our case, patient had undisplaced transverse fractures, for which open reduction and internal fixation with tension band wiring is preferred, which was the surgical approach used. Unless it is a comminuted fracture, patella is salvaged in order to maintain the extensor action of the knee joint. Post operatively, physiotherapy and partial

weight bearing is encouraged, as we did in our case, to prevent traumatic arthritis and intra-articular adhesions. Apart from the early weight bearing, Quadriceps strengthening exercises are also encouraged.

Conclusion

Isolated bilateral patellar fractures secondary to trauma are a very rare entity in the absence of other contributory factors. The surgical planning depends primarily on the fracture pattern. With adequate correction, post-operative morbidity and deformity is expected to be minimal.

Conflict of interest

None.

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