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BILATERAL TRAUMATIC PATELLAR FRACTURE :A CASE REPORT

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ABSTRACT Simultaneous isolated bilateral patellar fractures are very rare injuries and most often associated with systemic disorders such as hyper parathyroidism, osteoporosis stress fracture and kidney failure. Isolated bilateraI traumatic fracture of patella following an usual mode of injury is seldomly reported in the literature. We reported such a case following a injury over the both knee following the history of fall down without any associated injuries or comorbid condition. The patella on the right side had transverse close fracture which was fixed with two Kirschner wires following tension band principle and that on the left side had also close transverse fracture and which was fixed with two Kirschner wires following tension band principle. The patient achieved good outcome, at 6 months he was able to squat and sit cross legged, at one year he obtained nearly normal muscle strength and full range of motion. We discussed the injury mechanism , management and rehabilitation in such a case.

KEYWORDS : Fractures, bone, Patella

Patellar fractures account for approximately 1 % of all skeletal fracture and are seen frequently in the age group of 20 to 50 year[1-3]. The incidence in men is almost twice that in women. Patellar fractures can result from direct or Indirect forces[2-5]. The majority of them occur from direct injuries such as a blow to the patella from a fall , a motor vehicle crash or combination of these .In high-energy injuries the patient with a patellar fracture should be evaluated for potentiaI hip dislocations as weII as ftactures of the ipsi-IateraI femoraI neck or shaft distal femur and proximal tibia. indirect injuries occur from a near fall , a faII from height or as a combined injury.

Patellar fractures are relatively infrequent and bilateral patellar fractures are even rarer, occurring primariIy in skeletons with pathological fragibility. Few cases of bilateral patellar fractures in association with high energy polytrauma or comorbidities like hypothyroidism osteoporosis ,stress fracture and kidney failure (non-traumatic cases)can be found in the Iiterature[6-10] .There have been only two reports of simul·taneous occurrence of isolated bilateraI patellar fractures after trauma[11-12].The present article portrays an unusual injury pattern in a healthy male with bilateraI patellar fracture and with no other associated injury after fall from height. Informed consent has been taken from the patient before being included in to the study.

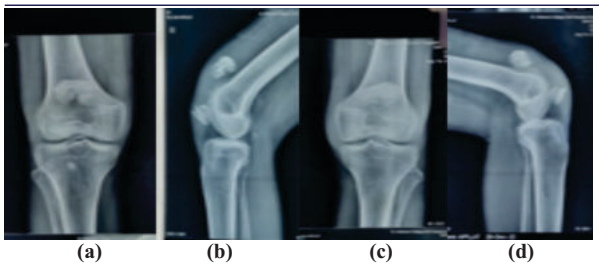
CASE REPORT

A 40 year old man presented to the emergency department of our hospital with history of fall down from hight of approximately 20 feet at working site. There was no history suggestive of chest abdominal, facial, head or spinal injury, ear or nose bleeding. The vitaI signs were stable and the main Complaints were pain, gross swelling and painful restriction of movements of knee joints ClinicaI examination on admission revealed a healthy male, who was fully con scious and orientated with a GCS score of 15. Clinical examination of the head and neck, chest, abdomen, spine and pelvis showed normaI results. The lower Iimb examination revealed grossly swollen both knee joint, DistaI circulation and neurology in both Iower limbs were normal. X-rays on bilateraI knee joints showed transverse fracture of right patella and left patella. Radiological screening showed no fracture of spine, pelvis, hip or femur. With no further delay the patient was taken up for open reduction under a spinaI anesthesia within 6 hours of his arrivaI at the emergency department. The patient lay in supine position with a tourniquet applied on the proximaI thigh. first on right side through a straight midline incision。 the patella was exposed by creating the retinacular flap. The knee joint had no Ioose fragments or any intra-articular damage to the cartilage. The fracture was reduced and held with patellar clamp, and the articular surface was evaluated for any malreduction. Two 2 mm Kirschner wires were used to maintain reduction. An 18 – gauge wire was used to encircle the patella and crossed over the anterior surface of the patella in a figure of eight suture. This Iimb was sequentially tightened to apply tension equally across the fracture site. The knee was placed through a full range of motion and normaI patellar tracking was noted. Wound was washed thoroughly and closed meticulously after retinacular repair over negative suction drain.

On Ieft side, through a straight midline incision, the patella was exposed same as on the right side.The fracture was reduced and held with patellar clamp, and the articular surface was evaluated for any malreduction. Two 2 mm Kirschner wires were used to maintain reduction. An 18 gauge wire was used to encircle the patella and crossed over the anterior surface of the patella in a figure of eight suture.This Iimb was sequentially tightened to apply tension equally across the fracture site. The knee was placed through a full range of motion and normaI patellar tracking was noted. Wound was washed thoroughly and closed meticulously after retinacular repair over negative suction drain.

After operation both knees were kept in fulI exten·sion with a hinged knee immobilizer. Drains were removed after 48 hours,isometric quadriceps strengthening exercises and gradual range of motion exercises were started.The patient was under a continuous rehabilitation programme and gradualIy knee movements were obtained. Gradual weight bearing was started at 4 weeks and the patient regained full weight bearing without support at 8 weeks.

At 4 months fulI movements were regained in the right knee joint where as the Ieft one regained 50 flexion. with restricted terminal knee flexion At 6 months the patient could squat and sit cross legged. At 1 year follow·up, he had no complaints or symptoms of patellar instability. and obtained normal muscle strength as weII as full range of motion without Iimitation in routine activities.



(a) (b) (c) (d)

FIGURE 1: (A,B,C,D) Pre operative x ray of both knee joint of anteroposterior and lateral view showing the fracture of the patella bilaterally. Both side there is close transvers fracture of patella.

(e) (f)

FIGURE 1: (E , F)Postoperative x ray of both knee joint of anteroposterior and lateral view, showing fracture fixation with tension bend wiring and k wire.

DISCUSSI0N

Patella is the largest sesamoid bone of the body and lies with in the fascia Iata and the fibres of the quadricepss tendon. Patellar fractures are uncommon Injuries and account for approximately 1% Of alI skeletaI iniuries, resulting from direct or indirect trauma[1-2]. The anterior subcutaneous Iocation makes it vulnerable to direct trauma. such as blow to the patella from a fall 0r a motor vehicle crash. Fracture caused by indirect mechanism results from violent contraction of the quadriceps with the knee flexed. The most significant influence of patellar fracture loss of continuity of the extensor mechanism of the knee and potential incongruity of the patella femoral articulation. BilateraI patellar fractures represent infrequent entity, accounting for approximately 2 to 9% of alI Iesions affecting patella. In most cases found in the published works。 they are described as stress fractures or as complications of chronic diseases such as osteoporosis, renal failure and secondary hyper parathyroidism[9]. It has been described in pa-tients with concomitant skeletal lnjuries but rarely as isolated injury.

In the present case, the mode of trauma was peculiar. A 40 year old male patient with history of fall down from height at his working site.In the Iiterature only two cases reporting traumatic bilateraI patellar fractures were found. One was an 18-year-old male with severe comminution and displacement of the right patella and cruciate fracture as well as minimaI displacement of the Ieft patella after his bicycle crashed in to a stone wall, which were respectively managed by total patellectomy and plaster of paris cast[11].

The other case was a 35 year old male who was involved in a motor vehicle accident and had dashboard iniury with comminuted transverse fracture of the bilateraI patella which was treated by close reduction and internal fixation (ORIF) using tension band technique. The treatment of patellar fractures depends on the type of fracture, size of fragment, integrity of the extensor mechanism, and congruity of the articular surface。 The overall goals of patellar fracture surgery are to preserve patella function, restore continuity of the extensor mechanism and reduce complications when associated with an articular fracture. The indications for non operative treatment for certain types of patellar fractures include minimal(<2mm)fragment separation, an intact articular surface, and an functionally intact extensor mechanism[13]. Operative treatment is recommended for patellar fractures with more than 2mm articular displacement or 3mm fragment separation, comminuted fractures with disruption of the articular surface, and osteochondral fractures with comminution or displacement.

All attempts should be made to salvage the patella except that with severely comminuted fractures. When-ever there exists excessive comminution that is not amenable to fixation, partiaI patellectomy can be used[2-14]. But what size of patellar fragments worth salvaging is controversial. Marder[15,16] et al found marked alteration in patella femoral contact area after 60%patellectomy where as Saltzman[17] et al found no correlation between the retained fragment and the final result.Near-normal out comes are seen when as many as large fragments are retained and articular surface is maintained. The proper site of insertion of tendon in to patellar fragment after partial patellectomy is also controversial. The ante-rior reattachment of patellar tendon causes excessive tilting of the lower pole of patella to ward femoraI articular surface。 leading to early patella femoraI arthritis[17,18]. However, Marder[16] et al in a cadaveric Study found that anterior reattachment of tendon restore a near normaI pattern of patella femoral contact. What ever the site 0f tendon reattachment is chosen, it must be ensured that intra operatively the extensor mechanism is not exceedingly shortened and the remaining patella is not tilted.

In our case , the patient required tension band wiring for fracture on both the right and left side patella, followed by physiotherapy under strict supervision to achieve good range of knee movments. Controlled passive range of motion exercise with a continues passive motion machine and early mobilization aided the patient overall condition.weight bearing with the knee brace locked in extension was allowed . in such cases with injury around the bilateral knee, urgent management with stable fracture fixation, spirited physiotherapy with earaly active range of motion exercise and weight bearing are essential. Rehabilation should include quadriceps strenghthning exercise.strict immobilization may leads to intraarticular adhesion and post traumatic arthritis, and there fore should be avoided. Gradually weaning of the brace should occur over the next 6 – 8 weeks.the knee should be protected for 3 to 4 weeks with immobilization. Independent of the kind of treatment , early rehabilition is recommended to achieve best results.

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