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ISOLATED TRAUMATIC BILATERAL PATELLA FRACTURE

Orthopaedics

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ABSTRACT

Introduction Isolated simultaneous bilateral patella fracture are very rare and often associated with systemic disorder such as osteoporosis , hyperparathyroidism and stress fractures. The Patella as a subcutaneous and cancellous bone is vulnerable to injury . Only few cases have been reported about simultaneous bilateral traumatic patella fracture in literature. **Case presentation** We report a case of traumatic simultaneous bilateral patella fracture . We have presented a 17 year female with fracture due to road traffic accident .We will discuss injury mechanism, management and rehabilitation in such patient and briefly review the literature. **Discussion** In simultaneous bilateral patella fracture good functional outcome can be accepted following a stable surgical fixation and a good rehabilitation. However, the type of fracture determines salvage vs sacrifice of patella.

KEYWORDS

Bilateral patella fracture , surgical fixation

INTRODUCTION

Patellar fractures account for approximately 1% of all skeletal fractures and is seen frequently in the age group of 20 to 50 years(1-3). The incidence in men is almost twice that in women. The majority of cases of patella are generally unilateral. Most of the cases occur due to direct trauma to patella as seen in road traffic accidents ,fall from height, dashboard injury or combination of all these. Indirect fracture is seen when there is a sudden and forceful contraction of the quadriceps while trying to decelerate a fall from height, upon touching the ground. Patellar fractures are relatively infrequent but simultaneous and isolated involvement of both Patellae is very rare. The present article portrays an unusual injury pattern in a healthy female with bilateral patellar fracture and with no other associated injury after road traffic accident.

Case Presentation

A 20-years female came to our emergency at JLNMCH, BHAGALPUR with history of road traffic accident, as she was hit by a four-wheeler. There was no history suggestive of chest, abdominal, facial, head or spinal injury, ear or nose bleeding. The vital signs were stable and the main complaints were pain, gross swelling of bilateral knee joint. Clinical examination on admission revealed a healthy female, who was fully conscious and oriented with a GCS score of 15/15. Clinical examination of spine and pelvis showed normal results. She had no medical co- morbidities. On bilateral knee examination, tenderness was present along with crepitus and painful range of movement. There was a 1.5 cm × 2 cm superficial abrasion over the anterior aspect of the right knee. Skin over left knee was intact. The patient was unable to do active Straight Leg Raising [SLR] onboth sides. Distal circulation and neurology in both lower limbs were normal. Plain X-rays, including anteroposterior and lateral views of both knee joints were performed. Routine trauma series X-rays, including chest X-ray, X-ray pelvis with both hip joints-anteroposterior view, and X-rays of cervical and lumbar spine were normal. The patient presented with simultaneous and isolated bilateral patella fracture. On the right side, there was comminuted fracture of patella and on the left side there was transverse fracture of the patella (figure1). Cylindrical slab was applied over both lower limbs.

All blood investigations were normal. Open reduction and internal fixation on both sides was done under spinal anaesthesia and tourniquet control in supine position. Left side was operated first. A-14-cm midline vertical incision was made over the left knee centred over the fracture. The skin and subcutaneous tissue was cut. Thorough joint lavage was done, to clear the debris and haematoma. On visual inspection, the knee joint had no loose fragments. The fracture was reduced and held with patellar clamp, and the articular surface was evaluated for any abnormality. Two parallel 2 mm Kirschner wires were passed from distal fragment to proximal fragment through the fracture. Using 18-gauge SS wire, tension band wiring was done and compression at fracture site was achieved. Reduction was confirmed using C-arm machine in both anteroposterior and lateral view. K-wires were cut bent and deeply buried inside the soft tissue. Wound was washed thoroughly with normal saline. Medial and lateral retinaculum were repaired. Subcutaneous tissue and skin were closed in layers. Torniquet was deflated, negative suction drain was also fixed.

On right side, through a straight midline incision, the patella was exposed. The patella had severe comminution andreduction using tension band wiring was impossible. As the comminution was not amenable to be fixed, so transosseous vicryl through the larger fragment was passed and encerclage using Kirschner wire and 18G SS wire was done. The small comminuted fragment was resected. After the surgery, both knees were kept in full extension with a hinged knee immobilizer .

On post-operative day 2, drain was removed. X-ray bilateral knee was advised (figure2). Patient was advised for quadriceps and hamstring exercises.

Gradual knee exercises were initiated after one week. Stitches was removed after 14 days and gradual knee movement was initiated. Gradual weight bearing was started at 4 weeks. At 6 weeks of post-operative follow-up, patient had 5-to-90-degree passive knee ROM. At 3 months follow up, patient had knee passive ROM of 0 to 90 degrees . Her follow up x-ray as seen in (figure 3).

DISCUSSION

In human body, among the skeletal system, patella is the largest sesamoid bone which develops in the quadriceps tendon of the body. The main function of patella is to improve the efficiency of quadriceps muscle (4). Despite being a subcutaneous and a cancellous bone, fractures of the patella account for only 1% of all skeletal injuries, and bilateral involvement accounts for approximately 2.9% of all lesions of patella (5). The anterior subcutaneous location makes it vulnerable to direct trauma, such as blow to the patella from a fall or a road traffic accident.The main adverse effect of patella fracture is loss of extension around knee joint. Damage to extensor retinaculum is one of absolute indication for operative management (6).

The first case of simultaneous bilateral patella fracture was probably reported by Desault (1817). He noted fractured 'rotula' of each knee, produced by convulsions on the operating table in the lithotomy position (7).

Lately, in 2011, Cirpar et al. reported a case of a, 35-yearold male who

had sustained a dashboard injury and fractured both patellae (8). Tension band wiring was done on both sides and the patient recovered well. In 2012, Vinay et al. reported on a 40-year-old male who had sustained injury in a road traffic accident (9). One side was an open transverse fracture fixed with K-wires and the other side was a closed comminuted fracture treated with partial patellectomy. The final outcome was satisfactory.

There are various method used for ORIF of these fractures; Tension band wiring (TBW) technique using Kirschner wires and 18G SS wire are most commonly used. Tension band wiring which works on principle of converting tensile forces into compressive forces when movements occur at the knee Joint but some surgeons also suggest augmentation of TBW with circumferential cerclage wiring to enhance the strength of fracture fixation.

Our patient had peculiar fracture pattern; with comminuted fracture in right side and transverse fracture at left side.

Bilateral patella fracture was fixed by open reduction and internal fixation (a-right-by cerclage and b-left by tension bandwiring), followed by physiotherapy under strict supervision to achieve good range of knee movement.

CONCLUSION

Patella is important for effective function of quadriceps and proper biomechanics of knee joint. Thus, it should be preserved whenever possible. To the best of our knowledge, this type of fracture pattern had not been previously reported in the literature. So, in simultaneous isolated bilateral Patella fractures, good functional outcome can be expected following a stable surgical fixation and a structured rehabilitation protocol as described above.

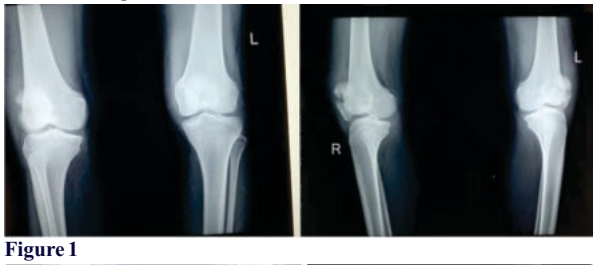

Figure 1

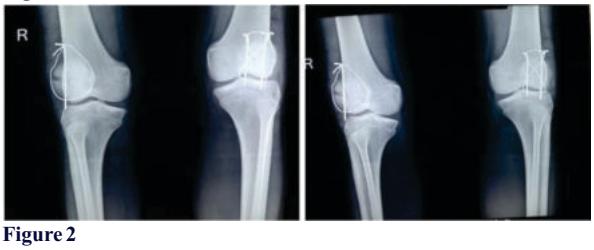

Figure 2

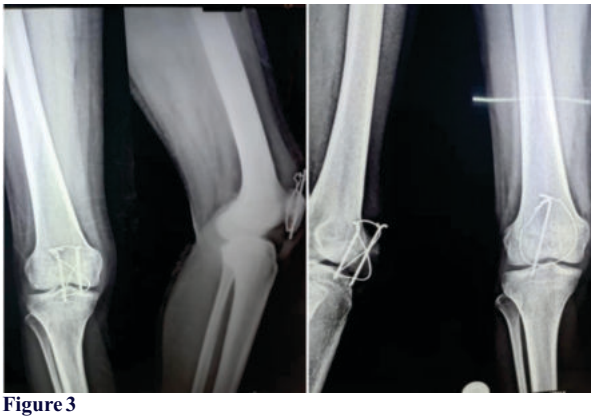

Figure 3

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