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ORIGINAL ARTICLE

Assessment of profile of patellar fractures in known population

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ABSTRACT:

Background: Fractures of the patella are serious injuries with a broad range of subtypes.The present study was conducted to assess profile of patellar fractures in known population. **Materials & Methods:** 88 patients of patellar fractures of both genders were included. Parameters such as fracture, dislocations, etiology of fracture, associated injuries were recorded. **Results:** Out of 88 patients, males were 50 and females were 38. Etiology was road traffic accident in 52, fall in 30 and domestic violence in 6 cases. Management given was closed reduction in 24 and open reduction and fixation in 64. **Conclusion:** Most common cause of fracture was road traffic accident and maximum cases were treated by open reduction and fixation.

Key words: Road traffic accident, open reduction and fixation, Patella

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INTRODUCTION

Fractures of the patella are serious injuries with a broad range of subtypes.[1]These injuries account for about 1% of all skeletal injuries and are most prevalent within the age group of 20–50 years. Epidemiologic studies demonstrated that the incidence in men is twice as high as in women.[2] Because of the subcutaneous anterior location, the biomechanical function and the high level of force transmission during extension and flexion, stable reconstruction of patellar fractures continues to represent a major surgical challenge. The majority of cases are caused by direct injury mechanism. The resulting fracture type depends on the trauma mechanism (i.e. direct or indirect), the energy transmitted to the bone and the bone quality.[3,4]

Displaced comminuted patellar fracture requires surgical treatment. The purpose of surgical treatment is to restore the patellar articular surface and the disrupted knee extensor mechanism. Patellar comminuted fracture is a great challenge for clinical orthopaedic surgeons.[5] The main challenge is that sometimes, it is difficult to obtain anatomical reduction and rigid internal fixation, resulting in poor functional outcome. At present, the treatment methods of patellar comminuted fracture include the following: circumferential cerclage wire fixation, modified tension band fixation.[6]

Knee pain is the second most prevalent condition, with patellofemoral pain (PFP) being considered one of the most common forms of knee pain, with a prevalence cited between 15% to 45%. It is described as non-traumatic in nature, with diffuse anterior knee pain on activities that load the joint such as squatting, running, climbing and descending stairs.[7]The present study was conducted to assess profile of patellar fractures in known population.

MATERIALS & METHODS

The present study comprised of 88 patients of patellar fractures of both genders. All were informed regarding the study and their written consent was obtained.

Demographic data of patient was recorded. A thorough clinical examination was carried out. Parameters such as fracture, dislocations, etiology of fracture, associated injuries were recorded. Results of the study were analysed statistically. P value less than 0.05 was considered significant.

RESULTS

Table I: Distribution of patients

Total- 88		
Gender	**Males**	**Females**
Number	50	38

Table I shows that out of 88 patients, males were 50 and females were 38.

Table II: Assessment of parameters

Etiology	Number	P value
RTA	52	0.02
Fall	30	
Domestic violence	6	

Table II< graph I shows that etiology was road traffic accident in 52, fall in 30 and domestic violence in 6 cases. The difference was significant (P< 0.05).

Graph IAssessment of parameters

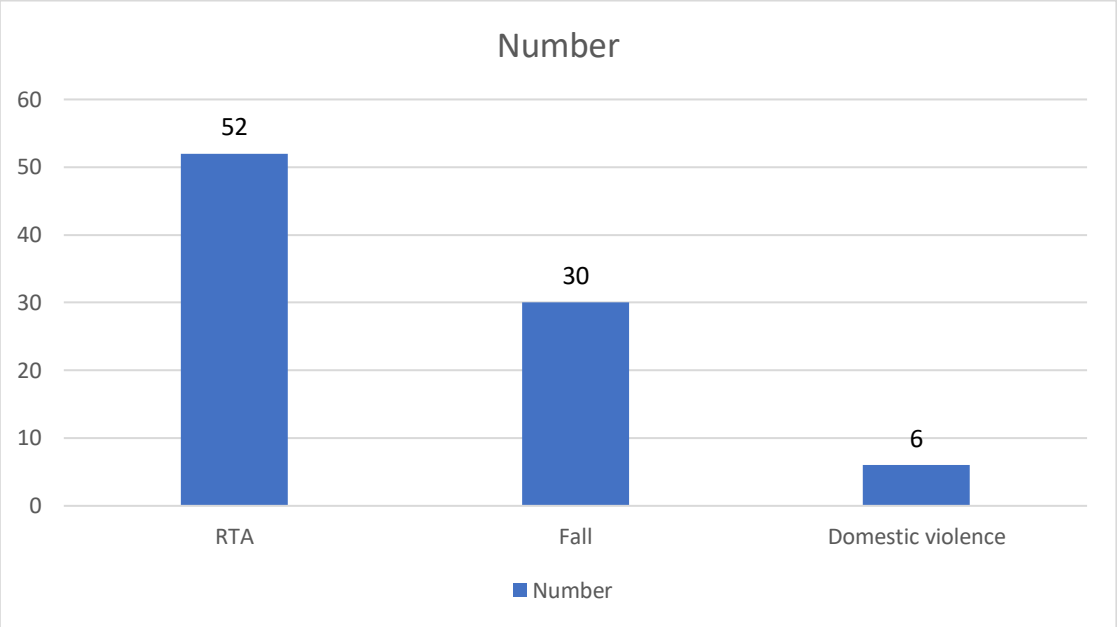

Table III: Management given

Management	Number	P value
Closed reduction	24	0.01
Open reduction and fixation	64	

Table III shows that management given was closed reduction in 24 and open reduction and fixation in 64. The difference was significant (P< 0.05).

DISCUSSION

The patella is the largest sesamoid bone of the human body and is embedded in the quadriceps tendon. It is one of the few bones without a periosteal surrounding.[8] The proximal three-fourths of the patella are covered by a thick layer of cartilage, whereas the remaining distal pole is not part of the articular congruency.[9] The adjacent quadriceps muscle consists of four muscles, of which the rectus femoris is the longest and most superficial.[10] The deep layer of the quadriceps tendon inserts at the proximal basis of the patella whereas the superficial fibers extend over the patella itself continuously to the tibial tuberosity.[11]Before surgical repair of the patella a brief preoperative planning should be obtained. This includes the choice of implants, surgical approach and a drawing of the fracture pattern with the estimated implant position. Thereby the surgeon gets acquainted with the fracture pattern and the required equipment can be chosen in advance.[12] The procedure is performed under epidural or general anaesthesia with the patient placed in a supine position. Peri-operative antibiotics should be administered approximately 30 minutes before skin incision. An intraoperative thorough physical examination – especially focussed on the ligamentous structures of the knee – should be performed prior to placing a tourniquet to the patient's thigh.[13]The present study was conducted to assess cases of patellar fractures.

In present study, out of 88 patients, males were 50 and females were 38. Sun et al[14] included 38 cases of simple unilateral closed comminuted patellar fracture treated by modified cerclage wiring. Among these cases, 16 patients were males and 22 were females, aged 23–68 years (average 40.4 ± 9.1 years). Comminuted patellar fractures were classified according to the AO/OTA classification: 10 cases were type 34-C2 (three fragments), 28 cases were type 34-C3 (more than three fragments). Postoperative complications including loosening of internal fixation, fragment re-displacement, non-union, infection, breakage of internal fixation and traumatic

osteoarthritis were assessed. The clinical results after operation were evaluated by the clinical grading scales of Böstman including range of movement, pain, work, atrophy, assistance in walking, effusion, giving way, and stair-climbing during follow-up. A total of 38 patients were followed up for 6–36 months (mean time 16.1 ± 5.8 months). The bone union radiographically occurred at approximately 2.5–3.5 months (mean time 2.92 ± 0.25 months). No postoperative complications, such as infection, dislocation, breakage of the implants, painful hardware, and post-traumatic osteoarthritis, were observed. According to the clinical grading scales of Böstman, satisfactory results were obtained, and the mean score at the final follow-up was 28.7 (range 20–30) points. Thirty-two patients (84.2%) with excellent results had a mean score of 29.5 ± 0.7 (range 28–30) points, and six patients (15.8%) with good results had a mean score of 24.5 ± 2.2 (range 20–27) points. The patients with excellent and good scores had active flexion of 130° (110–140)

We found that etiology was road traffic accident in 52, fall in 30 and domestic violence in 6 cases. Smith et al[15] 23 studies were included. Annual prevalence for patellofemoral pain in the general population was reported as 22.7%, and adolescents as 28.9%. Incidence rates in military recruits ranged from 9.7–571.4/1,000 person-years, amateur runners in the general population at 1080.5/1,000 person-years and adolescent amateur athletes 5.1%–14.9% over 1 season. One study reported point prevalence within military populations as 13.5%. The pooled estimate for point prevalence in adolescents was 7.2% (95% Confidence Interval: 6.3%–8.3%), and in female only adolescent athletes was 22.7% (95% Confidence Interval 17.4%–28.0%).This review demonstrates high incidence and prevalence levels for patellofemoral pain. Within the context of this, and poor long- term prognosis and high disability levels, PFP should be an urgent research priority.

We found that management given was closed reduction in 24 and open reduction and fixation in 64. Asimuddin et al[16] in their study carried clinical and radiological investigations. Patients underwent Tension Band Wiring or Circumferential Wiring for the sustained fracture. Patients were followed up at 4 weeks, 8 weeks, 12 weeks till fracture union and once at 1 year after surgery using Reich and Rosenberg criteria. There was no significant difference regarding the mean age, gender, and mechanism of the fractures in patients treated by two methods of TBW and CW. 1 case of superficial infection and 3 cases of joint stiffness were noted after CW and 1 case of superficial infection and 2 cases of joint stiffness had occurred after TBW. 60% excellent, 25% good, 5% fair and 10% poor results were observed after Circumferential Wiring and 65% excellent, 15% good, 15% fair and 5% poor results after TBW. Patients of both groups showed an appreciable and statistically significant improvement in functional outcome at 3 months follow-up period as evidenced by Reich and Rosenberg Criteria that reveals no major difference. Furthermore, the difference in improvement between the two groups was not statistically significant at 3 months

CONCLUSION

Authors found that most common cause of fracture was road traffic accident and maximum cases were treated by open reduction and fixation.

REFERENCES

1. Mehdi NSA, Nasser S, Saeid T, S. Comparison of displaced patellar fracture treatment by two methods: Cerclage circumferential wiring versus tension band wiring. Pak J Med Sci. 2012;28(5):787–90.
2. Dudani S, Sancheti KH. Management of patellar fracture with tension band wiring. Indian J Orthop. 1981;15:43–8.
3. Lin T, Liu J, Xiao B, Fu D, Yang S. Comparison of the outcomes of cannulated screws vs. modified tension band wiring fixation techniques in the management of mildly displaced patellar fractures. BMC Musculoskelet Disord. 2015; 16: 282.
4. Choi HR, Min KD, Choi SW, Lee BI. Migration to the popliteal fossa of broken wires from a fixed patellar fracture. The Knee. 2008; 15(6): 491-493.
5. LeBrun CT, Langford JR, Sagi HC. Functional outcomes after operatively treated patella fractures. Journal of orthopaedic trauma. 2012; 26(7): 422-426.
6. Melvin JS, Mehta S. Patellar fractures in adults. J Am Acad Orthop Surg. 2011; 19(4): 198-207.
7. Weber MJ, Janecki CJ, McLeod P, Nelson CL, Thompson JA. Efficacy of various forms of fixation of transverse fractures of the patella. J Bone Joint Surg Am. 1980; 62(2): 215-220.
8. Bedson J, Jordan K, Croft P. How do GPs use x rays to manage chronic knee pain in the elderly? A case study. Ann Rheum Dis. 2003;**62**:450–454.
9. Morgan B, Mullick S, Harper WM, Finlay DB. An audit of knee radiographs performed for general practitioners. Br J Radiol. 1997;**70**:256–260.
10. Hopman-Rock M, de Bock GH, Bijlsma JW, Springer MP, Hofman A, Kraaimaat FW. The pattern of health care utilization of elderly people with arthritic pain of the hip or knee. Int J Qual Health Care. 1997;**9**:129–137.
11. McAlindon TE. The knee. Balliére's Best Pract Res Clin Rheumatol. 1999;**13**:329–344.
12. Hannan MT, Felson DT, Pincus T. Analysis of discordance between radiographic change and knee pain in osteoarthritis of the knee. J Rheumatol. 2000;**27**:1513–1517.
13. Peat G, Lawton H, Hay E, Greig J, Thomas E, for the KNE-SCI Study Group Development of the KNE-SCI: a research tool for studying the primary care clinical epidemiology of knee problems in older adults. Rheumatology. 2002;41:1101–1108.
14. Sun Y, Sheng K, Li Q, Wang D, Zhou D. Management of comminuted patellar fracture fixation using modified cerclage wiring. Journal of orthopaedic surgery and research. 2019 Dec;14(1):1-8.
15. Smith BE, Selfe J, Thacker D, Hendrick P, Bateman M, Moffatt F, Rathleff MS, Smith TO, Logan P. Incidence and prevalence of patellofemoral pain: a

systematic review and meta-analysis. PloS one. 2018 Jan 11;13(1):0190892.
16. Asimuddin M, Shah S, Fatima A. A comparative study of tension band wiring versus circumferential wiring in the management of patellar fractures. Indian J Orthop Surg 2021;7(2):118-122.