



Research paper

Traumatic isolated osteochondral fractures of medial femoral condyle treated with multiple retrograde Kirschner wires – A simple cost-effective technique



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ABSTRACT

Management of osteochondral fractures of the knee is very crucial to prevent early onset osteoarthritis in young adults. Currently, fixation by biodegradable screws, bioresorbable pins or meniscus arrows can be expensive and also carries risk of complications, such as synovitis and osteonecrosis. In a developing country such as India, there is a need of cost-effective, safe and reproducible treatment option to fix these kinds of fractures. We report the results in 11 patients (seven males and four females) with mean age of 28.09 years, with isolated traumatic osteochondral fracture of medial femoral condyle that was treated between June 2011 and May 2015 with multiple Kirschner wires (K wires). Mean time interval between injury and surgery was 4 days (range, 2–6 days). Through medial parapatellar arthrotomy, the fragment was fixed to its corresponding bed in the medial femoral condyle in a retrograde manner with multiple non-parallel K wires (1.6–2.5 mm). K wires were first drilled through the reduced fragment, the medial femoral condyle and out through the skin on medial side of knee and distal thigh while ensuring through the arthrotomy site that the intra-articular tips of the wires were flush or just buried below the cartilaginous surface of the fragment. Mean time of the union was 8.5 weeks and full range of motion was achieved by 11 weeks. Mean follow-up was 54 weeks (range, 40–64 weeks). Clinical outcomes were found to be excellent in all the patients. Mean IKDC score was 94.9, mean Lysholm score was 94.8 and mean Likert score was 4.63 (range, 4–5) indicating a high level of satisfaction. None of the patients developed any major complications. In third world countries with limited resources, multiple K wires are a safe, reproducible and relatively inexpensive method of treating these complex joint injuries in young adults.

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1. Introduction

Traumatic osteochondral fracture of the knee is a common clinical entity in orthopaedic surgery and was first described in 1943 by Milgram.¹ Large osteochondral fractures are uncommon and an early diagnosis is essential for primary fixation of the fragment. The main purpose of fragment fixation is to maintain

contour of the joint and prevent the development of early onset osteoarthritis. The aetiology and management of osteochondral fracture is very well different from other osteochondral problems, such as Ahlbacks disease or osteochondritis dissecans. Osteochondral fractures generally present at lateral femoral condyle and are associated with tearing of anterior cruciate ligament (ACL) and patellar dislocation.² However, a direct shearing force to the knee can also lead to an isolated osteochondral fracture of the medial femoral condyle. The management of osteochondral fracture presents a complex and a daunting task for orthopaedic surgeons, particularly in young patients with large osteochondral fragments. There are only a handful of options available in literature for fixing the fractures. Management of these lesions can be done by two different ways, either removal of small fragment and allowing injured part to regenerate or re-fixation of osteochondral fragment

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Table 1
Patient master chart.

S no.	Age (in years)	Side	Interval between injury and surgery (in days)	Union time (in weeks)	IKDC score at final follow-up	Lysholm score at final follow-up	Likert scale at final follow-up
1	24	Right	3	8	98	96	5
2	26	Left	4	10	93	93	4
3	22	Right	4	8	96	97	5
4	28	Right	5	9	94	95	5
5	32	Left	6	8	97	97	5
6	36	Right	2	9	95	94	4
7	29	Left	2	8	94	94	5
8	27	Right	4	9	92	93	4
9	31	Right	6	9	94	92	4
10	30	Left	3	8	96	96	5
11	24	Right	5	8	95	96	5

to its original anatomical position. In the past, various surgeons considered it as loose body and had a tendency to remove it, leaving an area of bone denude of cartilage.² Currently, in modern orthopaedics, there has been an inclination towards complete restoration of osteochondral fragment. Several surgical techniques have been proposed for the fixation of the osteochondral fractures, such as fixation of osteochondral fragment by means of biodegradable screws, bioresorbable pins, bridging sutures or meniscus arrows.^{3,4} If avascular and comminuted osteochondral fragments are there, then artificial osteochondral grafts and autologous chondrocyte implantation (ACI) can be employed to fill the cartilage defect. In a developing country like India, where a large number of athletes sustain this type of injury, these treatment options are quite expensive procedures and cannot be afforded by most patients. Further, The Central Drugs Standard Control Organization (CDSCO) in India has not yet approved the laboratories for culture preparation for autologous chondrocyte implantation. Fixation of a displaced viable osteochondral fragment to its bed in the femoral condyle with multiple Kirschner

wires (K wires) is a novel, simple, cost-effective and reproducible treatment alternative for managing these type of injuries in young population. The purpose of this study is to report our clinical results and highlight a safe, economical and effective surgical method for fixation of osteochondral fractures.

2. Materials and methods

This was a retrospective study where we retrieved the records of 21 patients who underwent fixation of osteochondral fragment between June 2010 and May 2015. Isolated traumatic osteochondral fractures of medial femoral condyle were included in the study whilst excluding patients with associated ligament injuries, meniscus tear or patellar instabilities. 12 patients fulfilled the inclusion criteria; one patient was untraceable, leaving 11 patients (seven males and four females) in the present study. Their mean age was 28.09 years (range, 22–36 years) and right side ($n = 7$) was more commonly involved than the left ($n = 4$) (Table 1). The predominant mechanism of injury was a twisting injury imparting

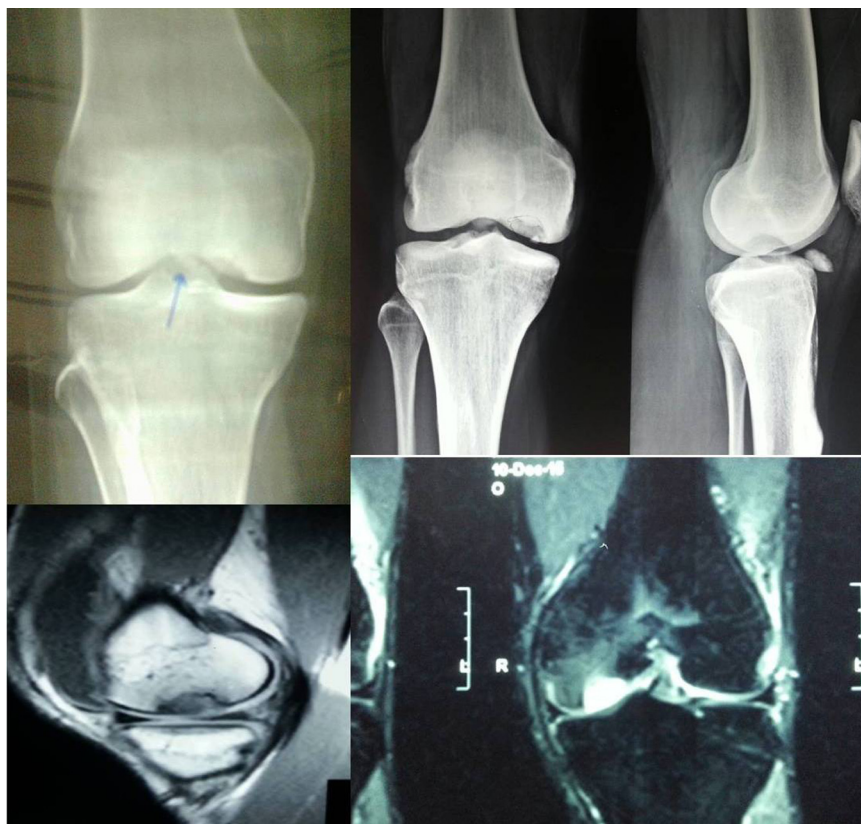


Fig. 1. Preoperative radiographs and MRI scan of knee showing displaced osteochondral fragment (OCF) and defect in the medial femoral condyle (MFC).

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