International Journal of Research in Orthopaedics
*Jindal S et al. Int J Res Orthop. 2025 Nov;11(6):1593-1596*
http://www.ijoro.org

DOI: https://dx.doi.org/10.18203/issn.2455-4510.IntJResOrthop20253439

**Case Report**

# Pipkin fracture dislocation with ipsilateral lateral collateral ligament and medial collateral ligament avulsion injury-a rare case report

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**Received:** 08 September 2025
**Accepted:** 10 October 2025

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## ABSTRACT

Pipkin fractures are complex femoral head fractures typically associated with posterior hip dislocation. Concomitant injuries of the knee ligaments, especially involving both the medial collateral ligament (MCL) and lateral collateral ligament (LCL), are exceedingly rare. Early diagnosis and coordinated management are critical to preserving joint function and preventing long-term complications such as osteonecrosis or instability. We report an unusual case of a high-energy trauma resulting in a Pipkin type II fracture-dislocation with ipsilateral LCL and MCL avulsion injuries.

**Keywords:** Pipkin fracture, Femoral head fracture, Hip dislocation, MCL avulsion, LCL avulsion, Multiligament knee injury

## INTRODUCTION

Pipkin fractures are classified into four types based on the location of the femoral head fracture and associated injuries. Femoral head fractures are mostly suffered by young adults and most common mechanism is dashboard injury during high energy motor vehicle accidents.[1] Knee ligament injuries associated with such trauma are rare and infrequently reported. As per our search there is no case report of pipkin fracture associated with ipsilateral LCL and MCL avulsion injuries.

We report an unusual case of a high-energy trauma resulting in a Pipkin type II fracture-dislocation with ipsilateral lateral femur condyle fracture and LCL avulsion from fibula and MCL avulsion from femur. Early recognition and a multidisciplinary surgical approach led to successful management and functional recovery. Simultaneous MCL and LCL avulsion injuries are highly unusual and suggest a complex force transmission through the limb. This case underlines the importance of high degree of suspicion for associated injuries and the value of advanced imaging in diagnosis.

## CASE REPORT

A patient 39 years old male came to emergency room after high-speed road side accident in February 2024. The patient presented to emergency in hemodynamicaly stable condition. Patient complained of pain in left hip and knee. On examination patient had left lower limb extended and internally rotated with intact neurovascular status.On xrays evaluation patient had Pipkin fracture dislocation left hip along with ipsilateral femoral lateral condyle fracture and Lateral collateral ligament avulsion from fibula (Figure 1). Patient also had MCL avulsion fracture from ipsilateral femur condyle. Emergency hip reduction was attempted but unsuccessful due to associated head fracture.Patient was planned for staged procedures. In first stage open reduction and internal fixation via safe surgical dislocation approach (Ganz approach) was performed. Fracture fragments were seen and assessed intra operatively (Figure 2). The femoral head was anatomically reduced and fixed using headless compression screws (Figure 3). Intra operatively hip joint reduction and stability was assessed and found to be satisfactory. Then post operatively CT scan and MRI left knee were done for

complete evaluation (Figure 4). In second stage surgery medial and lateral collateral ligament avulsions were repaired. The MCL was reattached using suture anchors. Lateral femoral condyle fracture was assessed and LCL was intact on femoral side. Femur condyle was fixed with cannulated cancellous screws and then LCL avulsion from fibular head was fixed using suture anchor. Post operatively physiotherapy was initiated on day 2. Hinged knee brace was given to allow 0-90° flexion for 6 weeks. Patient was kept non weight bearing for 6 weeks. At 6 months, the patient regained full hip and knee range of motion. Currently patient is more than one and half year post operative and is doing well both radiologicaly and clinically (Figure 5 and 6). No signs of hip avascular necrosis on radiographs and no knee instability or pain during ambulation. Patient is still under follow up and doing well.

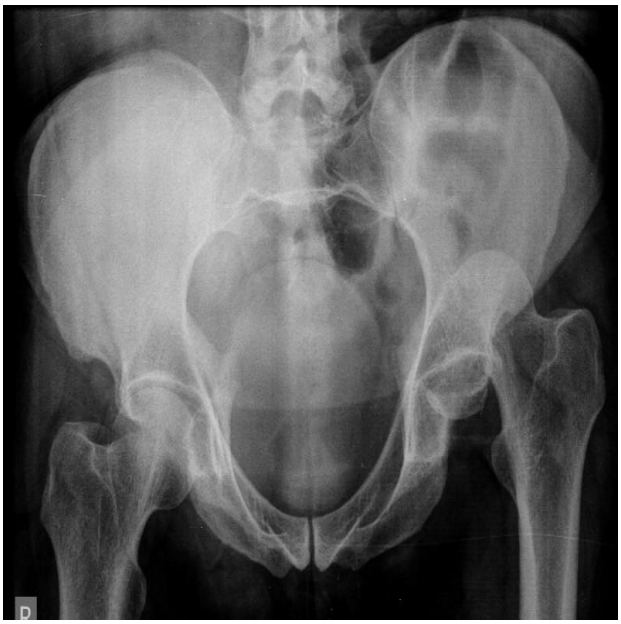

**Figure 1: Pipkin fracture dislocation left hip.**

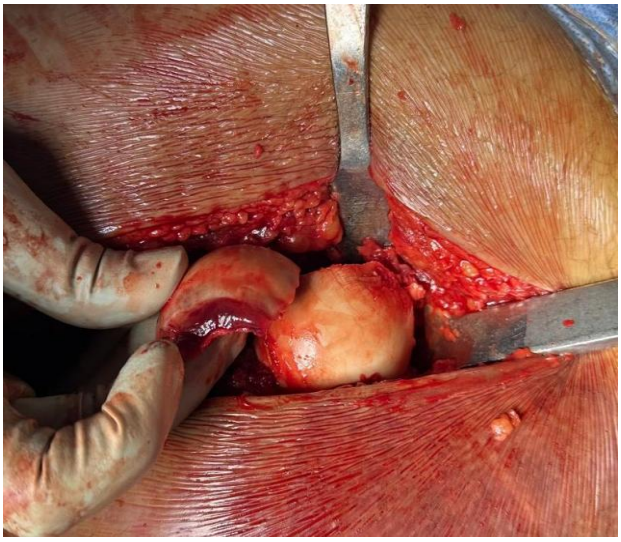

**Figure 2: Intra operative femur head fragments.**

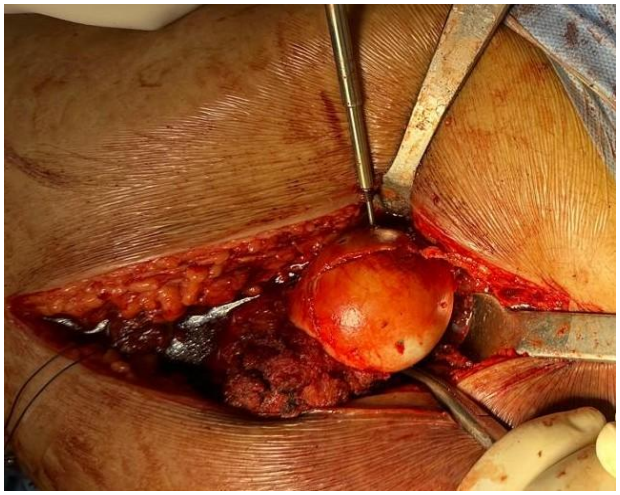

**Figure 3: Head fixation with headless compression screws.**

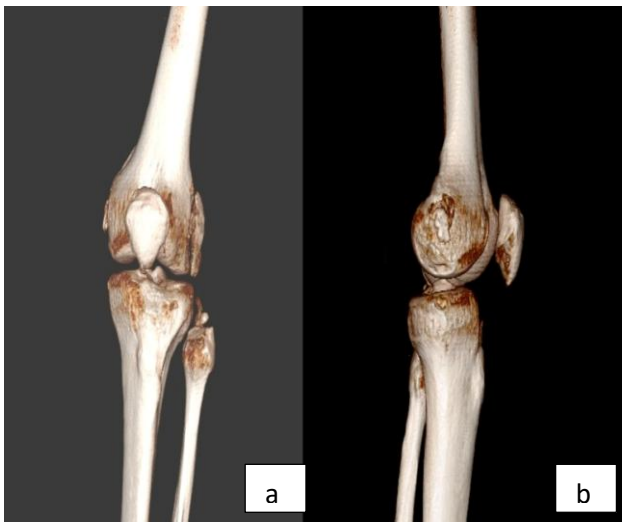


**Figure 4 (a and b): CT scan showing LCL and MCL avulsion.**

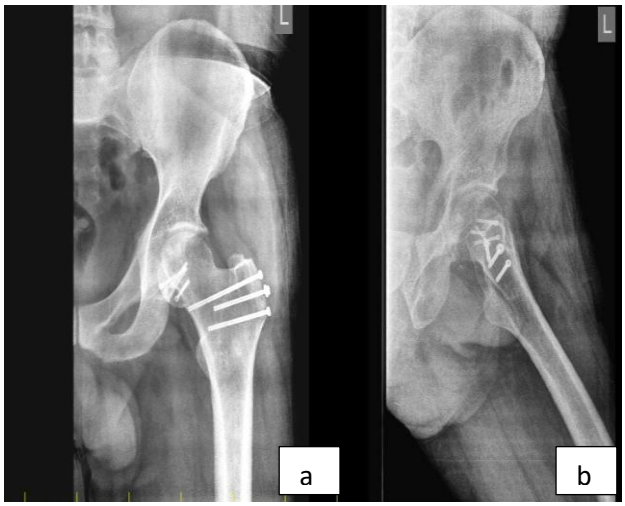


**Figure 5 (a and b): X-rays showing well maintained femur head contour.**


**Figure 6 (a and b): X-ray of healed ligament avulsion injuries.**

## DISCUSSION

Femoral head fracture with hip dislocation has been described by various different classification systems. Pipkin classification is followed in routine practice as it is significant in planning management and predicting prognosis. Pipkin classified these injuries into four types: type 1 is defined as a hip dislocation with a femoral head fracture caudad to the fovea capitis; type 2 is defined as a hip dislocation with a femoral head fracture cephalad to the fovea capitis; type 3 fractures are a type I or type II femoral head fracture with an associated femoral neck fracture and type 4 fractures are defined as a type 1 or 2 with an associated acetabular rim fracture. Type 3 fractures are least common of all other types.

Pipkin femoral head fractures are often a result of a high-energy mechanism.[1,2] Early management of Pipkin fractures has been associated with better outcomes and reduced risk of complications. Complications associated with pipkin fractures such as post traumatic osteoarthritis, avascular necrosis and sciatic nerve palsy can lead to poor functional outcome.[2-5] The femoral head necrosis occurs due to lack of blood supply resulting from prolonged dislocation of the hip joint. The prognosis of Pipkin type 3 femoral head fracture is worse than that of other subgroup of Pipkin fractures due to severe damage to blood supply to the femoral head.

The MCL and lateral collateral ligament are important stabilizing structure of the medial and lateral side of the knee respectively.[6,7] They resists valgus and varus stress, provides static and dynamic stability to the knee. Knee ligament injuries associated with Pipkin fractures are infrequent and has chances to be missed during initial presentation.

Presence of knee ligament injuries can complicate the treatment and affect the overall prognosis. Managing these associated injuries simultaneously is important for best outcomes. Due to chances of missed knee injuries these often require a high degree of suspicion to diagnose and treat effectively. If not properly diagnosed and treated can cause complications such as knee instability or posttraumatic osteoarthritis, and affecting a patient's quality of life. Surgical repair of acute multi-ligament knee injuries results in better functional recovery particularly in avulsion types.[8,9]

Extensive post operative rehabilitation is important for getting the desired outcome. Presence of multiple ligament injuries along with pipkin fracture dislocation can complicate post operative rehabilitation process. There is no available rehabilitation protocol for such case scenarios so rehabilitation protocol must be customized for each patient.

## CONCLUSION

This case highlights a rare combination of injuries: pipkin type II fracture-dislocation with ipsilateral femoral condyle fracture and LCL and MCL avulsion injury. A timely, multidisciplinary surgical approach ensured optimal alignment, joint stability, and excellent functional outcomes. Clinicians should remain vigilant for associated ligamentous injuries when treating high-energy femoral head fractures.

*Funding: No funding sources*
*Conflict of interest: None declared*
*Ethical approval: Not required*

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**Cite this article as:** Jindal S, Kalia A. Pipkin fracture dislocation with ipsilateral lateral collateral ligament and medial collateral ligament avulsion injury-a rare case report. Int J Res Orthop 2025;11:1593-6.