Common Peroneal Nerve Laceration in Closed Fibular Head Avulsion Fracture: A Case Report

Ravi Gupta[1], Jagdeep Singh[2], Kavin Khatri[2], Nitin Bither[3]

What to Learn from this Article?

Early exploration in selected cases of nerve injuries as described can lead to good functional outcome.

Abstract

Introduction: The common peroneal nerve (CPN) injuries are the most common among lower limb nerve injuries because of its fixed attachment in the region of the neck of the fibula. The involvement of CPN following varus displacement of the knee is commonly expected to be traction neuropraxia. The spontaneous recovery is usually expected and the not so favorable results of repair have led to a debatable consensus on its surgical management. Closed transaction/laceration of nerve following sports injury is highly uncommon.

Case Report: A 27-year-old male sustained closed avulsion fracture of the fibular head with complete foot drop following a hyperadduction injury to the knee. Early operative exploration revealed peroneal nerve laceration which was repaired primarily along with anatomical reduction of the fibular head which yields good results following early repair.

Conclusion: This case review emphasizes that severe damage to CPN may occur in spite of closed injuries to the knee. Patients presenting with fibular head avulsion fractures at the knee and CPN injury should be subjected to early intervention with repair or reconstruction of the avulsion injuries and exploration of CPN to achieve good clinical outcome.

Keywords: Common peroneal nerve, laceration, fibular head avulsion.

Introduction

The common peroneal nerve (CPN) is susceptible to injury because of its fixed attachment in the region of the neck of the fibula [1]. CPN is vulnerable to traction neuropraxia following varus stress to the knee. The associated ligamentous injuries to the knee often guide treatment in this scenario with expectant management of the CPN. Although spontaneous recovery is usual, irreversible damage is also likely. Laceration of the CPN is reported commonly following sharp injuries or with high-energy knee dislocations along with multiligamentous injury [2, 3]. Early repair/exploration of the CPN indicated in open/penetrating injuries. Early repair in closed CPN injuries is debatable with no clear consensus. We report an exceedingly uncommon association of CPN laceration along with a closed fibular head avulsion fracture in a 27-year-old male, sustained while playing

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cricket. Early exploration with repair of the CPN and stable fixation of the fibular head lead to good outcome in this case.

Case Report

A 27-year-old male presented to emergency with pain and swelling on posterolateral aspect of the right knee following a varus thrust while playing cricket. Clinical examination confirmed the findings along with foot drop and dense hypoesthesia in CPN distribution. Radiological examination revealed a displaced avulsion fracture of fibular head (Fig. 1 and 2). Magnetic resonance imaging of the right knee showed avulsion fracture of the fibular head with attached lateral collateral ligament and midsubstance tear in the posterolateral capsule of the knee along with edematous soft tissue engulfing the CPN suggestive of its compression. There was edema present in the midsubstance region of both cruciate ligaments (Fig. 3). There was no sign of meniscal injury. The patient was advised to undergo open reduction and internal fixation of bony avulsion from the fibular head to restore the posterolateral stability of the knee joint along with simultaneous exploration of the CPN. The right knee was examined under anesthesia, and there was Grade II opening on varus stress testing at 30° and 60° flexion. There was no other sign of instability at the right knee.

The right knee was approached through the posterolateral approach. The bony avulsed fragment from the fibular head with attached lateral collateral ligament and popliteofibular ligament was identified. The CPN was found to be lacerated approximately by 50% of the total diameter (Fig. 4). The fibular head avulsion was anatomically reduced and fixed with a single 4 mm partially threaded screw (Fig. 5). The knee was found to be stable after fixation. Neurolysis of CPN was done microscopically, and repair of nerve fascicles was done without tension. Post-operative bracing of the knee with intermittent range of motion was started on the 3rd day. The patient was followed up for knee stability and CPN recovery. After 1 year, post-operative knee is stable with grade 3/5 power (MRC grading) at the right ankle, and sensations recovered up to 50% over the right foot. The strengthening exercises for quadricep and hamstring group of muscles were also started in the immediate post-operative period. There was gradual improvement in sensory and motor power during the follow-up.

Discussion

A fibular head avulsion fracture is a rare entity. In a retrospective study of 2318 knee injuries, only 13 sustained this fracture (0.6%) [4]. The importance of recognition of this injury lies in the fact that it is an important indicator of posterolateral instability of the knee. The lateral collateral ligament and tendon of the long head of the biceps femoris muscle are attached to the lateral margin of the fibular head. The popliteofibular, arcuate ligaments are attached to the fibular styloid process [5]. The avulsion of this bony fragment with its attached insertion of the posterolateral corner ligamentous structures is referred to as "arcuate" sign. Although rare, it is highly indicative of underlying posterolateral corner injury. In our case, the patients was subjected to operative intervention due to the presence of this injury [6, 7]. The CPN is susceptible to injury due to its limited longitudinal mobility [8]. Hyperadduction injury at the knee may lead to extensive damage to the lateral ligamentous structures of the knee and CPN [9]. Platt was the first to report the association of posterolateral corner injuries with peroneal

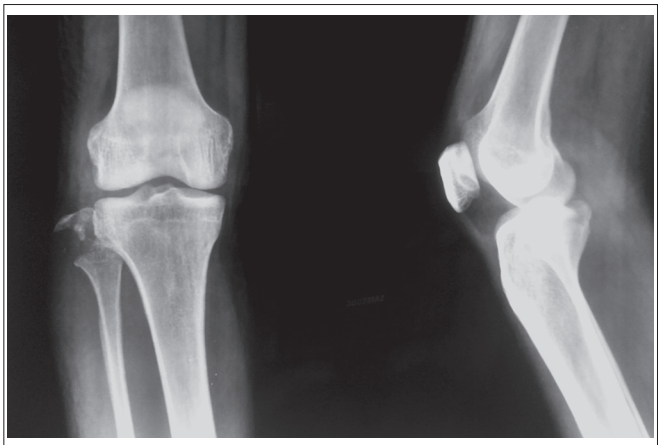

Figure 1: Pre-operative X-ray shows avulsion fracture of the fibular head without dislocation of the knee joint.

Figure 2: Anteroposterior view of injured knee under varus stress shows opening of lateral joint line.

nerve injury [10]. Watson-Jones had noted extensive injury to the CPN in cases with injury to the lateral ligamentous complex of the knee [11]. Occasionally, CPN injury can occurs with multiligament knee injuries associated with knee dislocations with incidence of 16-40% in patients [3].

We are reporting a case of CPN laceration in a closed posterolateral corner complex injury with avulsion of fibular head which is a rare entity**.** In literature, there are few case reports showing such type of injuries. In a study of six cases having similar injuries due to varus or adduction strain, only one had complete CPN transaction [12]. In another study of 54 cases of posterolateral corner injuries, only 9 patients had CPN palsy of which 7 cases were associated with avulsion of the fibular head [13]; however, there is no mentioning of the common peroneal nerve laceration. In a series of six cases, only two patients had complete rupture and rest of the four cases had nerve in continuity [14]; however, there is no evidence of involvement of avulsion of the fibular head. In another case report, there is CPN traction injury along with ligamentous injuries in the patient while playing rugby in which end-to-end repair was done after removing the damaged part [15], but there was no mentioning of fibular head avulsion.

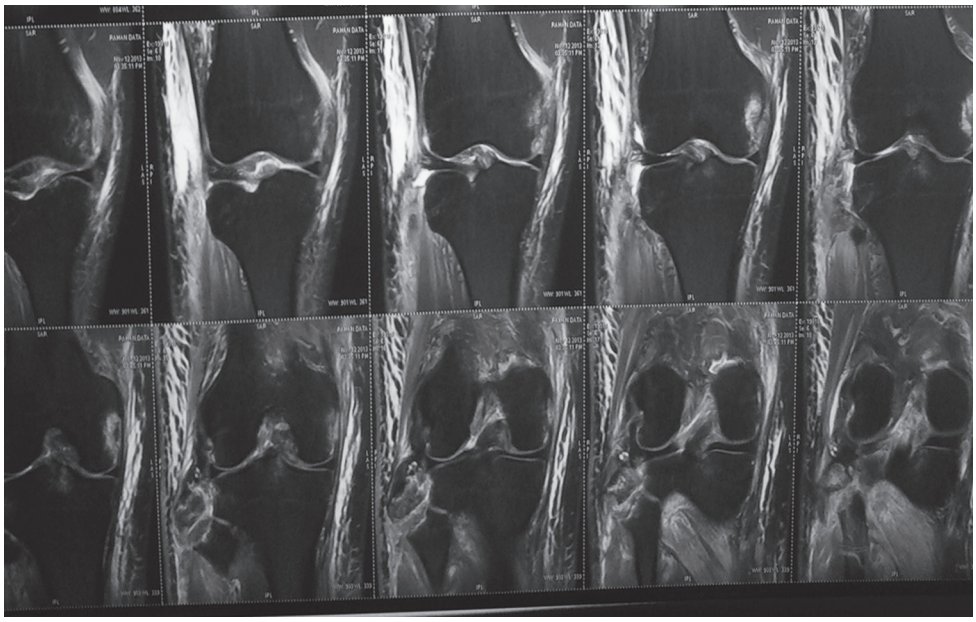

Figure 3: Magnetic resonance imaging section shows avulsion of the fibular head with soft-tissue edema around fibular neck.

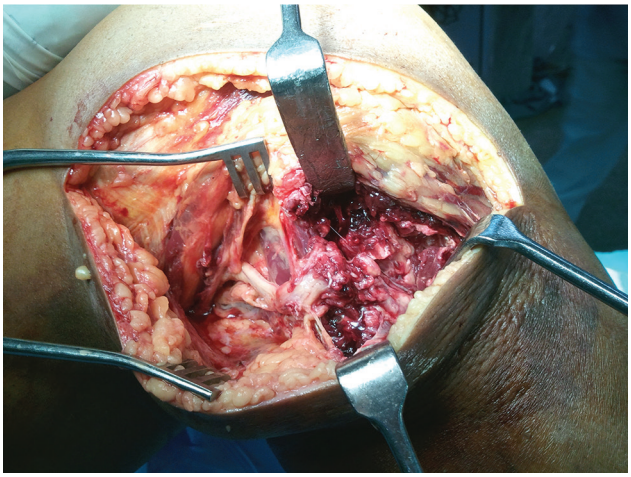

Figure 4: Intraoperative photograph shows lacerated common peroneal nerve with retracted avulsed fibular head along with ligaments.

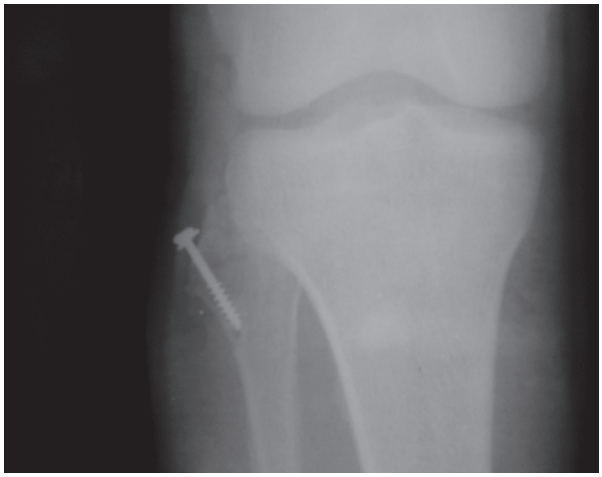

Figure 5: Post-operative X-ray showing fixation of avulsed fibular head.

In general, laceration of the CPN occurred either due to sharp injuries [2] or with knee dislocations along with multiligamentous injury due to high-energy trauma which is well supported by number of studies [3]. In our case, laceration of CPN occurred in closed varus/adduction injury without knee dislocation. We did primary nerve repair along with fixation of avulsion fracture of fibular head to restore the stability of knee joint, and the patient had an uneventful recovery.

Conclusion

We conclude that the CPN laceration in closed hyperadduction injury associated with fibular head avulsion fracture is a rare complex. Patients presenting with fibular head avulsion fractures at the knee and CPN injury should be subjected to early intervention with repair or reconstruction of the avulsion injuries and exploration of the CPN to achieve a good clinical outcome.

Clinical Message

The case report emphasizes on deviating from the usual expectant diagnosis and management of closed CPN injury. Early exploration in selected cases as described can lead to a good outcome.

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