Ossified medial collateral ligament of the knee: two case reports

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Calcification of the femoral origin of the medial collateral ligament (MCL) of the knee is named as Pellegrini–Stieda lesion. Post-traumatic ossification of the whole MCL rarely occurs and results in limitation of range of motion of the knee. We present two case reports with post-traumatic ossified whole MCL with limited range of motion. Surgical excision of the bony mass was carried out after which the knee was medially unstable. MCL reconstruction was carried out using a distally based semitendinosus ligament, which was looped to reconstruct the superficial MCL and the posterior oblique ligament. It is important to reconstruct the MCL of the knee to restore the medial instability that results after excision of an ossified whole MCL.

Keywords:
knee, medial collateral ligament, ossification, Pellegrini–Stieda

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Introduction

Pellegrini–Stieda (PS) sign is a recognized radiographic finding, which describes the calcification of the origin of the medial collateral ligament (MCL) after a history of trauma of the knee. It may be associated with pain and a restricted range of motion and is known as the PS syndrome. If left untreated, this ossification may form a significant bony mass resulting in a marked limitation of range of motion of the knee [1]. Ossified whole MCL rarely occurs and described before as heterotopic ossification following total knee replacement [2]. We describe two cases of post-traumatic ossified whole MCL and their management.

Case report

In 2012, a 30-year-old man presented at our clinic with a stiff right knee. His history revealed a motor car accident with a fracture of his right femur 1 year before, which was treated with an interlocking nail. He developed a stiff knee and presented to us with 15° flexion deformity and flexion range up to 40°. His radiographs revealed ossification of the whole MCL (Fig. 1a).

A medial approach to the knee was performed; the bony mass was identified (Fig. 1b) after dissection and then excised using a chisel osteotome. Upon removing the ectopic bone the range of motion increased spontaneously. Full extension and flexion improved to 110°. On examination of the knee, there was a significant laxity on the medial side, for which MCL reconstruction was performed. The MCL reconstruction was performed using a distally based semitendinosus tendon, which was looped; the looped end was fixed with an interference biodegradable screw into a tunnel just proximal and posterior to the medial femoral epicondyle after testing the isometry to reconstruct the superficial MCL, and the free end of the loop was fixed with an interference biodegradable screw into a tunnel in the posteromedial upper tibia 1 cm below the joint line to reconstruct the posterior oblique ligament (Fig. 1c). Satisfactory stability after reconstruction was obtained. For 6 weeks postoperatively the knee was placed in a removable hinge brace and oral indomethacin was administered. Six months after his surgery the patient was pain free and had full range of motion. There were no complications and no radiographic recurrence of the calcification. His knee remained stable after reconstruction of the MCL.

In 2013, a 52-year-old male patient was presented to our clinic with stiff right knee. There was a history of fracture of the tibial plateau of the right knee in a motor bicycle accident 2 years ago. The fracture was fixed with plate and screws (Fig. 2a). He was presented to us with range of motion of complete extension and flexion up to 30°. A medial approach to the knee was used and complete excision of the mass was performed, after which the knee was medially unstable on examination. MCL reconstruction was performed using an ipsilateral distally based semitendinosus tendon to reconstruct the superficial MCL and the posterior oblique ligament as described before. The range of flexion improved up to 130° immediately

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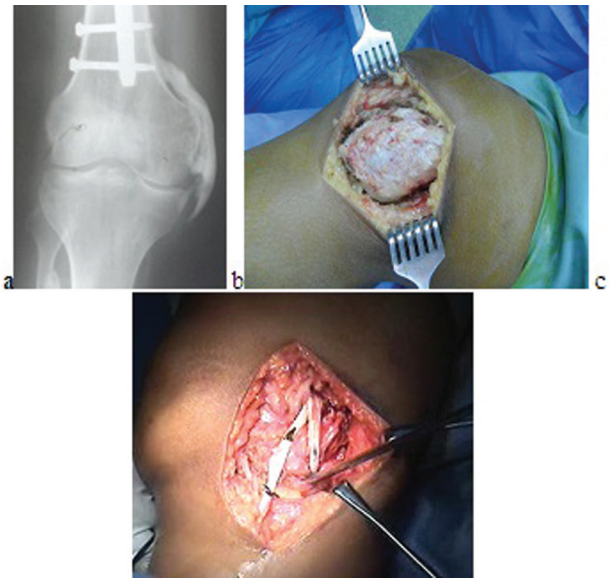
Figure 1



(a) Ossified whole medial collateral ligament (MCL). (b) Dissection and identification of the bony mass. (c) MCL reconstruction with distally based semitendinosus.

Figure 2

(a) Ossified medial collateral ligament after tibial plateau fracture. (b) Range of flexion increased after excision of the mass.

after excision of the bony mass (Fig. 2b). A hinged knee brace was applied and nonweight bearing was instructed for 6 weeks. The patient was medially stable with range of flexion up to 130° after 6 months of follow-up with no radiographic evidence of recurrence.

Discussion

The most important finding of this study is that a compromise to the integrity of the MCL should be anticipated after excision of the MCL ossification. It is important to test MCL integrity intraoperatively after excision of the mass. A distally based semitendinosus tendon provides a good option for reconstruction of the MCL. The pathogenesis of PS lesion has been debated in the literature; however, all presentations have a common presentation. There is a history of trauma to the knee and the lesion seems to appear after a delayed presentation of ~3 weeks. An association with a head injury is not uncommon. The pain may be felt over the whole knee and has been reported to mimic septic arthritis [3]. Pellegrini inferred that the lesion was caused by periosteal proliferation and metaplasia of the MCL. Stieda felt that it was originally an avulsion fracture of the medial femoral condyle [1]. Other theories included calcification of haematoma, myositis ossificans and a fracture callus. The accepted theory is that of trauma to the MCL resulting in hydroxyapatite or calcium pyrophosphate

dihydrate crystal deposition [3]. More recently, anatomical and magnetic resonance study has suggested that ossification in PS disease is not just confined to the MCL but can also involve the adductor magnus tendon [4]. Newly formed lesions are active and the lesion must mature to an inactive state before surgical excision is performed as there is a high rate of recurrence in younger lesions, which are still proliferating. Wang and Shapiro [5] described excision of a 1 cm lesion and reconstruction of the MCL by repair of the femoral origin of the MCL using sutures and a screw into the femur. Theivendran *et al*. [1] described excision of the ossified mass and reconstruction of the superficial MCL only using the adductor tendon. In our cases we anatomically reconstructed both superficial MCL and posterior oblique ligament, which has not been described before.

Conclusion

Surgical excision of the post-traumatic ossified MCL markedly improves the range motion but it results in instability of the medial side of the knee. MCL reconstruction with a distally based semi-tendinosus tendon successfully restored the medial stability of the knee.

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Conflicts of interest
There are no conflicts of interest.

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