INTRODUCTION

Meniscus ossification is an extremely rare disorder. The pathogenesis is still unclear. The researchers proposed three different theories as to the etiology of meniscal ossicle, which are as follows: degenerative, congenital and post-traumatic. A meniscal ossicle is often associated with various meniscal tears, of which tear of the posterior root of the medial meniscus (PRMM) is the most common. Pain is the most common symptom among the patients presenting with meniscal ossicle and results from mass effect or associated tear. The rate of misdiagnosis is quite high due to its presentation on radiologic imaging modalities. On X-ray scans, meniscal ossicle can be mistaken for a loose body, whereas on MRI it can be misdiagnosed as a tear or chondrocalcinosis due to increased signal sensitivity. Hereby, we present a case of meniscal ossicle associated with the posterior root of medial meniscus tear with emphasis on radiologic imaging and arthroscopic findings.

CASE REPORT

A 46-year-old female presented to our outpatient clinic with intermittent chronic left knee pain of unknown origin for 1 year. In the last month, the pain was aggravated by walking but alleviated after rest. The patient reported no recent history of trauma, surgeries, etc. Physical examination revealed medial joint line tenderness that did not affect the movements, no signs of ligamentous laxity or interlocking knee joint were observed. Conventional anteroposterior radiography of the left knee showed a small round bony fragment projecting in the posterior aspect of the intercondylar eminence, which was initially identified as a loose body by a radiologist (Figure 1). CT scan revealed a high-density bone mass in the posteromedial side of the knee joint (Figure 2). MRI demonstrated a small, well-defined hyperintense lesion lying within the posterior horn of the medial meniscus (PHMM), isointense to the bone marrow, which is suggestive of meniscal ossicle (Figures 3 and 4). No osteochondral lesions were observed. Considering clinical and imaging findings, the diagnosis of meniscal ossicle and PRMM tear was made, so surgery to repair the PRMM and resect ossicle were suggested to the patient.

Arthroscopy revealed a meniscal ossicle of a diameter of 1 cm adjacent to the PHMM (Figure 5A and B), PRMM tear and a small injury (1 cm²) of articular cartilage of the medial femoral condyle. Following identification and resection of the meniscal ossicle, PRMM tear was repaired via transtibial pullout technique (Figure 5C and D). After that, we exposed the damaged surface of the medial femoral condyle. Kirschner wires were used to drill into the damaged cartilage allowing to begin microfracture surgery. No abnormalities were observed at the end of the surgery. The patient was sent back to the ward after surgery and soon discharged from the hospital. She did not complain of...
any discomfort after surgery and during follow-up (the last one took place 8 months post-operatively).

**DISCUSSION**

Among existing theories of the pathogenesis of meniscal ossicles, post-traumatic theory is the most widely accepted and most commonly found in the relevant literature. An injury may lead to heterotopic ossification, metaplasia and osseous avulsion, contributing to meniscal ossicle development. However, our patient did not report any history of trauma.

A recent research not only supported findings stated in previous articles that PRMM is the most frequent site of occurrence of meniscal ossicles, but also that progression of meniscal ossicles...
Asymptomatic patients do not require a surgical intervention. However, when symptoms or other tears are present, ossicle removal is the suggested approach. Patients that were diagnosed with meniscal ossicles and MMRT tear and received surgical treatment had a significantly higher outcome score compared to patients that received only conservative treatment. Moreover, orthopaedicians should always keep in mind the possible risk of progression of arthritis in such patients. A pullout repair can be used to repair MMRT tear. This technique can restore load-absorbing function of the medial meniscus and reduce meniscal extrusion thus reduce risk, thus, reduce the development of osteoarthritis.

In conclusion, meniscal ossicle is rarely seen in clinics. It is of utmost importance for every orthopedician and radiologist to be familiar with this entity, its diagnosis and treatment. Since our patient was symptomatic and was diagnosed with underlying PRMM lesion, a surgery was immediately suggested to her. The patient showed good recovery post-operatively and did not complain of any symptoms.

**LEARNING POINTS**

1. A meniscal ossicle is rarely seen in clinics, can occur without a history of trauma, and can be misdiagnosed on X-ray as a loose body, whereas MRI remains the gold-standard.

2. A pre-operative diagnosis of meniscal ossicle can help every orthopedician and radiologist to be familiar with this entity.

**AUTHOR’S CONTRIBUTIONS**

Qalib YO & Tang YC - Formal analysis, Investigation, Writing-original draft, Writing-review and editing.

Lu HD – review, editing and Supervision.

**COMPETING INTEREST**

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

**CONSENT FOR PUBLICATION**

Written informed consents were obtained from the patient for publication of this case report and any accompanying images.

**ETHICAL APPROVAL**

This study was approved by the local ethics committee. Informed consent was obtained from the patient.

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