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CASE STUDY

FABELLA SYNDROME: UNUSUAL CAUSE OF POSTERIOR KNEE PAIN

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ABSTRACT

Fabella Syndrome is an extra-articular cause of intermittent pain on the postero-lateral aspect of the knee caused by compression on the posterior part of lateral Femoral condyle by the Fabella bone. (Sesamoid bone in the proximal part of the lateral gastrocnemius muscle) In some cases, the sesamoid bone is replaced by fibrous tissue or the Fabello-fibular ligament. The symptoms are more commonly seen hypermobile population who commonly hyperextend their knees leading to rubbing of the Fabella or the fibrous tissue on to corresponding femoral condyle. Other than the pain at the back of the knee, Fabella is also implicated in its association with degeneration of the knee, causing instability of the knee and also in the common peroneal nerve palsy. Activity modification, analgesic medication, cortisone injections, physiotherapy and rehabilitation methods have been shown to control the symptoms but many times surgical excision of the Fabella bone is required.

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INTRODUCTION

Fabella is sesamoid bone (bone in long tendons) found in Lateral Gastrocnemius near its origin (Sutro, 1935)This was originally reported in the literature and referred to as ''sesamoide douloureux'' by Lepoutre in 1929. The occurrence of Fabella is variably reported in different studies depending upon the study population (Lepoutre, 1929; Zeng, 2012; Silva *et al*., 2010; Kawashima *et al*., 2007). Fabella can exist in cartilaginous or bony forms (Zeng, 2012; Kawashima, 2007; Flecker, 1942) and can be unilateral or bilateral in its occurrence (Sutro, 1935; Flecker, 1942). There has been reported occurrence of Fabello-fibular ligament between Fabella and Fibular head which is thicker and more evident in cases where Fabella is not present as a bony entity (Lepoutre, 1929; Zeng *et al*., 2012; Seebacher, 1982). In human beings this ligament is considered to be atavistic, although it is reported to help to stabilize the knees in Kangaroos (Seebacher, 1982). Fabella has been reported to be involved in Fabella syndrome (Seebacher, 1982) Some of the existing reports show an increased incidence of intermittent pain due to Fabella in young active athletes without evidence for preponderance for a specific sport (Seebacher, 1982; Segal *et al*., 200410). But it remains unclear why only some develop clinical symptoms.

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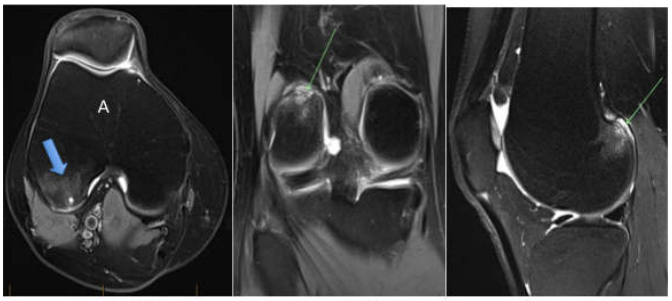
CASE REPORT

A 49 year old female was referred for concerns of postero-lateral knee pain which was spontaneous in onset and was ongoing intermittently from over a year. The pain pattern showed progressively worsening picture and the time of consultation with us, she had persistence of symptoms at rest and was having night pain. She didn't have any swelling in her knee and denied locking or other mechanical symptoms. However, she was unable to perform deep squats and other activities of daily living which involved flexion beyond 90 degree and sudden extension movements. She was on treatment with thyroxine for hypothyroidism. She denied any other inflammatory joint pain. She found that driving her car and routine walks were not limited. On examination, she had full active range of motion in her knee. She had genu recurvatum on standing. Her knee was stable on testing the cruciate and the collateral ligaments were concerned. Flexion and rotation tests caused postero-lateral knee pain. She was tender on stressing the Popliteus. The extensor apparatus tested

normal. A Xray and a MRI scan of her knee was done to rule out foreign body, alignment issues, Popliteus injury and mensicus tear. (Image 1 and 2) The MRI scan showed a peculiar increased signal on the posterior aspect of lateral femoral condyle with degeneration suggestive of Fabella syndrome. The menisci were normal and so was the Popliteus muscle. Later a CT scan was done to confirm the presence of Fabella bone and also to rule out osteoid osteoma. Conservative management was advised to manage her symptoms which included activity modification, quadriceps activation and strengthening. Further, image guided cortisone injection was given to the site of ossific nucleus which resulted in over 50 % reduction of the pain. This was subsequently followed with rehabilitation which included, proprioception, avoidance of hyperextension of the knee, Lumbo-pelvic stability and gluteal control exercise and correction of other kinetic chain deficits. She was regularly followed up for clinical assessments and her symptoms showed gradual improvement. She was been followed up for 2 years and there has been no recurrence of her symptoms after the initial recovery. The bone bruise in postero-lateral femur was re-checked by repeating the MRI scan (primarily for academic interests) and the scan showed complete clearing of the bone bruise pattern with no residual deformity.



Fat suppressed MRI image sequences of right knee 49 year old female with Postero- lateral knee pain
A: Axial image; B: Coronal image; C: Sagittal image

Thick and thin arrows showing region of bone bruising and edema

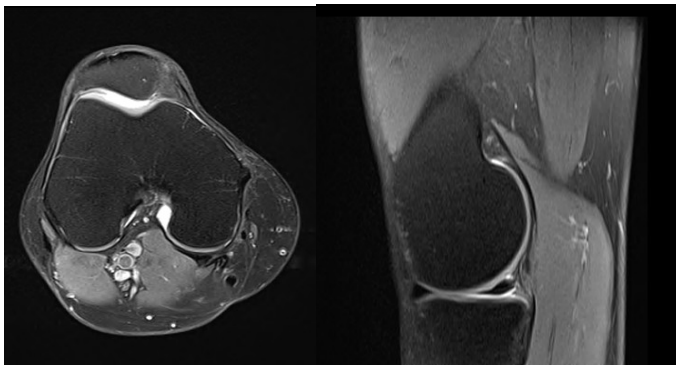


Image 1.

Table 1. Intra-articular and Extra-articular causes of Postero-lateral knee pain (Houston, 1978)

Intra-articular causes	Extra-articular causes
Foreign bodies in knee joint	Baker cyst
Meniscal tears	Fabella Syndrome
Localized pigmented	Ganglion
Villo-nodular Synovitis	Bony lesions- benign and malignant
Osteochondral Fragments	Referred pain
	Hamstring tendon pathology- tendinitis, tear

Table 2. Structures involved and proposed mechanisms involved in Fabella Syndrome (Friedman, 1978)

Structure involved	Proposed Mechanism
Fabello-Fibular Ligament	Either compressive or tensile forces
Gastrocnemius Tendon	Compression and irritation of the tendon
Femoral condyle	Periosteal Inflammation
Posterior Capsule	Compression of Fabella
Common Fibular nerve	Compression of neural tissue between Fabella and fibular head

DISCUSSION

Most of the patients of Fabella syndrome present with intermittent postero-lateral knee pain which is mechanical in nature. The pain is accentuated by full knee extension/hyperextension and hyper-flexion of the knee. The localized tenderness results from compression of the Fabella or the Fabello-fibular ligament against its corresponding femoral condylar surface (Weiner, 1982). In chronic phase, the pain symptoms persist as a dull ache even at rest. This forms an important differential diagnosis of Postero-lateral knee pain. (Table 1). The likely structures and mechanism involved in Fabella Syndrome are shown in Table 2: The size and position of a Fabella are considered as important factors in development of symptoms. Fabellar dimensions have been described as ranging from 0.4 to 2.2 cm in size in symptomatic cases (Segal *et al.,* 2004; Takeba *et al.,* 1981).

It has been suggested that a Fabella larger than 1 cm in size requires surgical excision especially in patients undergoing total knee replacement. (Kawashima *et al*., 2007; Weiner, 1982). Proximity of the Fabella to the common peroneal nerve risks its pathology (Takeba, 1981). Proximity of the Fabella to the femoral condyle has also been implicated in causing synovial irritation, bone edema and roughening of the articular surfaces (Weiner, 1982; Friedman *et al*., 1978). A 6-month trial of conservative care is recommended prior to consideration of surgery in children with Fabella syndrome. Conservative management would include analgesic medication, immobilization, restriction in activities and local steroid injections (Weiner, 1982). In a case report of Fabella syndrome, manual therapy produced immediate and dramatic reduction of symptoms (Zipple, 2003). The duration of relief was for more than 16 months. For many adults with Fabella syndrome, however, Fabellectomy has been advised early in the management of painful Fabella in some reports (Zipple, 2003; Houston, 1978).

Conclusion

Fabella syndrome should be considered as an important pathological entity in patients with postero-lateral knee pain especially with hyperlaxity or reports of hyperextension knee injuries with or without common Peroneal nerve palsy. The incidence of the Fabella syndrome appears to be higher in Asian population. In light of limited publications about the Fabella syndrome, its function and the consequence of its presence or absence is still not clear. The treatment options for treating Fabella syndrome include both non-operative and surgical excision. Even surgical intervention have guarded results, so treatment should be selected after weighing all risks and benefits and this might be a subject for further research to find out the best possible treatment for Fabella syndrome

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