

Case Report

## Fabella Syndrome of Bilateral Knee with Common Peroneal Nerve Compression Neuropathy

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**Abstract** — Fabella syndrome is a rare, often underdiagnosed cause of recurrent posterolateral knee pain. It can disrupt the common peroneal nerve because of its anatomical location at the lateral head of the gastrocnemius at the lateral femoral condyle, where the nerve typically passes. Far East Asians have been shown to have a higher prevalence of fabella syndrome attributed to their genetic predisposition combined with mechanical causes. Failure to adequately identify a common peroneal nerve neuropathy associated with fabella syndrome can lead to recurrent visits, unnecessary examinations, and surgical procedures. Here, we present a case of a patient presenting with recurrent posterolateral knee pain and a slapping gait. Therefore, a high index of suspicion for fabella syndrome is warranted by a physician to diagnose this condition for the best outcome for the patient.

**Keywords** — Knee pain; fabella; neuropathy; common peroneal nerve.

### I. INTRODUCTION

Fabella is a term originating from Latin meaning “*little bean*”. It is essentially a sesamoid bone located in the posterior knee joint, at the lateral femoral condyle and often embedded within the tendon of the lateral head of the gastrocnemius muscle. It can occur in a cartilaginous form, which makes it unable to be identified on plain knee X-rays. It may also become ossified, thus rendering it visualised on X-rays. What’s more, it can be fortified by its own set of ligaments and tendons, such as the fabella-fibular ligament, also known as the ligament of Vallois, which connects the fabella to the fibula head [1].

In terms of its prevalence, it can be present anywhere between 15- 40% of a population based on several studies [1-3]

with higher rates being present in the Far East Asia population [1,4]. Meanwhile, the development of the fabella remains a source of mystery. Day-to-day mechanical stresses associated with daily activities and coexisting genetic factors are thought to act concurrently to trigger osteocartilaginous metaplasia [5,6]. On the other hand, the pathogenesis of the common posterior-lateral knee pain, which is more common in children due to cartilage softening (chondromalacia fabellae) or osteoarthritic changes, was mostly seen in adults. Rarely the fabella can be dislocated or malrotated [2].

Another important pathogenetic mechanism of fabella syndrome is a compression neuropathy of the common peroneal nerve. Again, owing to its unfamiliarity, compression neuropathy of the common peroneal nerve is a very rare

diagnosis. Patients with this condition often present late due to difficulty diagnosing the condition [7].

In this article, we would like to draw attention to an unusual case of a patient presenting with posterior knee pain with difficulty ambulating, showing features of such neuropathy.

## II. CASE REPORT

A 52-year-old Nepali gentleman, working as a labourer at a shoe manufacturing company for the past ten years, presented with worsening bilateral knee pain of 1-week duration. He acknowledged having recurrent bilateral posterior knee pain for the past few years, which is often resolved with over-the-counter analgesics. However, with this presentation, he gradually lost his ability to ambulate and, upon arrival, required a wheelchair to ambulate in the clinic. The patient otherwise denied any history of recent trauma or fall, no fever or recent infections and had no previous episode of weaknesses. Interestingly, he mentions that he thought the pain was due to him often sitting in a squatting position during work.

Clinical examination revealed a fit gentleman with no previous medical problem. He was afebrile, and his vital signs were normal. In the preceding three days, he ambulated in a specific manner, later identified as a slapping gait. Due to this, he prefers using a wheelchair to ambulate. Bilateral knee examinations are normal, with no swelling, redness, joint effusion, joint line, or bony tenderness. The range of movement is full, both actively and passively. There was no ligamentous instability, and MacMurray's test was negative bilaterally. Posterior knee examination elicited a point of tenderness over the lateral aspect of both knees. Neurological examination of the lower limb elicited only a slightly weakened ankle dorsiflexion (power:3). However, lower limb sensation was normal. Gait examination showed a slapping gait of the right leg. However, language barrier hindered the clinical examinations and history taking, as the patient is neither fluent in English nor Malay.



Fig. 1 Plain X-Ray of the bilateral knee, AP view. The yellow arrow indicates the location of the fabella.

Plain X-rays of bilateral knees revealed the presence of the fabellas, with no other noteworthy findings in the bones. After diagnosis, the patient was recommended to undergo further consultation to rule out peroneal nerve neuropathy. However,

the patient revealed that he could not afford further consultations due to financial constraints. Thus, he has been prescribed analgesics, vitamin B supplements, and rehabilitation. The patient was keen to seek a second opinion and to arrange for financial support. As per our records, there were no further visits by the patient to the hospital after that.



Fig. 2 Plain X-Ray of the left knee, lateral view. Yellow arrow indicating the location of the left knee fabella.



Fig. 3 Plain X-Ray of the right knee, lateral view. The yellow arrow indicates the location of the right knee fabella.

In summary, we have described a rare case of common peroneal nerve compression neuropathy secondary to a fabella. Therefore, fabella pain syndrome should be considered a differential diagnosis when a patient presents with persistent posterolateral knee pain, which could also be due to meniscal tears, lateral ligament instability, Baker's cyst, and proximal tibiofibular joint hypomobility.

## III. DISCUSSION

Fabella is considered a normal anatomical variant, not a pathological entity per se [4]. However, the fabella can lead to painful postero-lateral knee pain, the process of which is termed 'fabella syndrome'. Owing to its relative unfamiliarity, it can be mistaken as an intra-articular loose body or osteophytes [6] and is often underdiagnosed. Franceschi et al. [6] also revealed how failure to recognise this syndrome leads to multiple unnecessary surgical procedures

In its role as a sesamoid bone, the fabella helps reduce friction within the knee joint posteriorly and, together with the fabella-fibular ligament, contributes to the stability of the knee joint by redirecting the mechanical force within the gastrocnemius muscle. As a sesamoid bone, it may assist muscle function by increasing the lever arm of the pull of the plantaris and gastrocnemius muscle [5]. Conversely, it could have no role at all.

The fabella's anatomical relationship with the common peroneal nerve is directly related to its pathogenetic mechanism, causing the common peroneal neuropathy. At the beginning of the popliteal fossa, the common peroneal nerve then passes laterally towards the lateral head of the gastrocnemius muscle, where the fabella is most commonly located. At this location near the neck of the fibula, the common peroneal nerve lies superficial and is therefore prone to injury [5].

Dalip et al. [8] revealed in a study of 102 knees of 51 cadavers how the anatomy of the common peroneal nerve is affected by the presence of a fabella. The study found that the common peroneal nerve near a fabella was wider and thinner compared to its proximal parts. In cases where the fabella are absent or when the common peroneal nerve passes medial to the fabella in contrast to posteriorly to the fabella, there were no differences in the nerve's size [8, 9]. Such a thinner common peroneal nerve makes it more susceptible to the effect of compression. In addition, of those who develop common peroneal nerve neuropathy, nearly 21% had the nerve posteriorly passing the fabella. Thus, establishing the correlation between the presence of fabella and its effect on the common peroneal nerve. Interestingly, the obese population are less prone to develop common peroneal nerve neuropathy, likely owing to more subcutaneous fat deposition around the area, making it less prone to compression by the fabella.

Clinically, diagnosis of common peroneal nerve neuropathy requires confirmation by an imaging study, preferably with a flexion/extension Magnetic Resonance Imaging (MRI) scan and nerve conduction studies [5]. In addition, there could be several other aetiology of common peroneal nerve neuropathy, including prolonged squatting and leg crossing, [5]. Here, the patient's propensity to squat during his day job as a shoemaker may have contributed to the exacerbation of the fabella syndrome. He was also relatively thin, which as aforementioned, might be another contributing factor.

In terms of its treatment, options between conservative and operative management exist. Physiotherapy, local injection with steroids and electrical treatment are the mainstays of conservative management options, although results are not very encouraging [10]. On the other hand, Fabellectomy is a procedure to cure a fabella syndrome with a good outcome as supported by much literature [4, 5, 10].

#### IV. CONCLUSIONS

Apart from that, fabella pain syndrome can be recognised by a quartet of posterolateral knee pain, with a localised tenderness on palpation and pain on full extension, as well as symptom relief by operative intervention confirming the diagnosis of fabella syndrome. Common peroneal neuropathy

is one of the complications of fabella syndrome. Subsequently, failure in recognising a problematic fabella may lead to unnecessary diagnostic dilemmas and surgical interventions.

#### CONSENT TO PARTICIPATE

Written informed consent was obtained from the patient for the anonymized information to be published in this article.

#### CONFLICT OF INTERESTS

The authors declared no conflict of interest and did not receive any funding for this article.

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