

Case series

Pellegrini-Stieda syndrome



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Abstract

Pellegrini-Stieda syndrome is a post-traumatic ossification/calcification of the medial collateral ligament (MCL), adjacent to the margin of the internal femoral condyle. In the light of four observations of Pellegrini-Stieda syndrome and a review of the literature, we propose to present the different epidemiological, etiopathogenic, pathological and radiological aspects of this rare syndrome. The role of imaging investigations, particularly of MRI (magnetic resonance imaging), is highlighted. Treatment is often medical, but in some cases surgical excision with ligament repair may be necessary.

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Introduction

The discovery of calcification of the origin of the medial collateral ligament (MCL) after knee trauma is a recognized radiographic finding. However, in the rare cases where this is associated with pain and limitation of knee movement, this is called Pellegrini-Stieda syndrome. It was first clinically described by Pellegrini in 1905 and Stieda then reported the first set of five patients in 1908 [1]. This ossification can potentially form a significant bone mass, discovered during a standard radiography, which is the first examination to be performed in front of any traumatic knee, possibly complete with MRI/CT scans (computed Tomography). We report four patients, who have benefited from radiology examination for post traumatic gonalgia.

Methods

We report four cases of Pellegrini-Stieda syndrome, three women and a man, mean age 45 years, victims of unilateral knee trauma in three cases and bilateral in one case. All patients have benefited from a standard radiography. Two patients have an MRI and one patient CT scan patient.

Results

Case 1: fifty four year old woman, victim of right knee trauma while falling down stairs. Clinical examination found pain on palpation of the inner side of the knee aggravated by the stress test in valgus. Radiographic findings: showed a calcification adjacent to the internal condyle, completed by CT scan. MRI found a constant hyposignal on all sequences corresponding to ossification of the MCL (Figure 1, Figure 2).

Case 2: fifty two old man, farmer, falling on the knee when slipping into a pit. An initial radiograph was normal, while a control radiograph performed six months later, showed calcification projecting on the edge of the internal femoral condyle. MRI complement was performed that confirmed ossification of the upper third of the MCL of the right knee (Figure 3, Figure 4).

Case 3: a fifty five year old woman, who had severe left knee pain following a fall in her height, with a significant reduction in knee flexion, which is discreetly swollen on the medial side, compared with contralateral knee. CT scan of the right knee showing ossification of the upper third of the MCL (Figure 5, Figure 6).

Case 4: a fifty eight year old woman, falling on both knees during a hustle. The patient suffered a limitation of activity due to bilateral gonalgia. The clinical examination found an obese patient (BMI=40) with a significant reduction in flexion of both knees and exquisite pain on palpation of the medial faces of both knees. Radiography showed ossification in the pathway of both MCL (Figure 7).

Discussion

The Pellegrini-Stieda lesion is defined as post-traumatic calcification and/or ossification on the medial collateral ligament (MCL) of the knee [1,2]. In the rare cases where this calcification is accompanied by gonalgia and limitation of knee flexion, it is called Pellegrini-Stieda syndrome [3]. Described for the first time in the 1900's, the pathogenesis is probably the calcification of a post-traumatic hematoma, at least three weeks after the initial trauma [2], or secondary to repetitive microtrauma, but other postulated etiologies, including metaplasia of the ligamentous tissue, periosteal proliferation and a type of myositis ossificans [4]. Many theories have been

proposed to explain the pathogenesis of Pellegrini-Stieda disease, although none has been widely accepted. Pellegrini has suggested that calcification is caused by periosteal proliferation and direct metaplasia of the medial collateral ligament [1]. Alternatively, Stieda proposed that an avulsion fragment of the medial femoral epicondyle with subperiosteal proliferation of bone was responsible for this process [5]. Koning postulated that calcification develops at the soft tissue level, which corresponds to the intermuscular space between the tendon of the ischio-condylar portion of the magnus adductor muscle and the medial vastus muscle. Tenler believed that the process began as a hematoma that later calcified or even ossified [6,7].

Finally, Andreesen suggests that the lesion is secondary to traction-tearing of the tendon of the ischio-condylar part of the large adductor muscle with formation of a new periosteal bone [8]. Conventional radiography of the knee does not distinguish between ossifications originating from the medial collateral ligament (MCL) or gastrocnemius (GM), as suggested by Pellegrini and Stieda [7]. MRI or surgery may be the most reliable way to establish the origin of calcification on the medial side of the knee. MRI found a constant hyposignal on all sequences corresponding to ossification of the medial collateral ligament. Unfortunately, there are few studies devoted to the contribution of MRI in this clinico-radiological entity. Medical treatment is the rule, with initial rest, anti-inflammatory and physiotherapy. Patients who maintain instability with significant limitation of knee mobility may require surgical excision. If left untreated, this ossification can potentially form significant bone mass, which can compromise the range of motion of the knee.

Conclusion

The Pellegrini-Stieda syndrome is a relatively rare clinico-radiological entity, of etiopathogeny, which has been discussed since the first description in 1905. Sectional imaging, particularly MRI, is crucial in the analysis of ossification or calcification on the internal side of the traumatized knee.

What is known about the topic

- Conventional radiology may be sufficient to make the diagnosis.

What this study adds

- MRI is required to analyze any calcification near to the knee, to distinguish between calcification of the CML or a bone fragment;
- This radiological entity is found more frequently in women.

Competing interests

The authors declare no competing interests.

Authors' contributions

All the authors have read and agreed to the final manuscript.

Figures

Figure 1: axial proton density (PD) weighted image of a 54-year-old woman right knee: MCL ossification (white arrow)

Figure 2: coronal PD weighted image of the same patient: upper part ossification of the right MCL (white arrow)

Figure 3: coronal PD weighted image of a 52-year-old man right knee: upper part ossification of the right LLI (black arrow)

Figure 4: axial PD weighted image of the same patient: partial ossification of the right MCL (black arrow)

Figure 5: coronal view CT scan of a 55-year-old woman left knee showing calcification in projection of the MCL (white arrow)

Figure 6: life like illustration in 3D reconstruction of the knee (white arrow)

Figure 7: post traumatic ossification of both MCL (white arrow)

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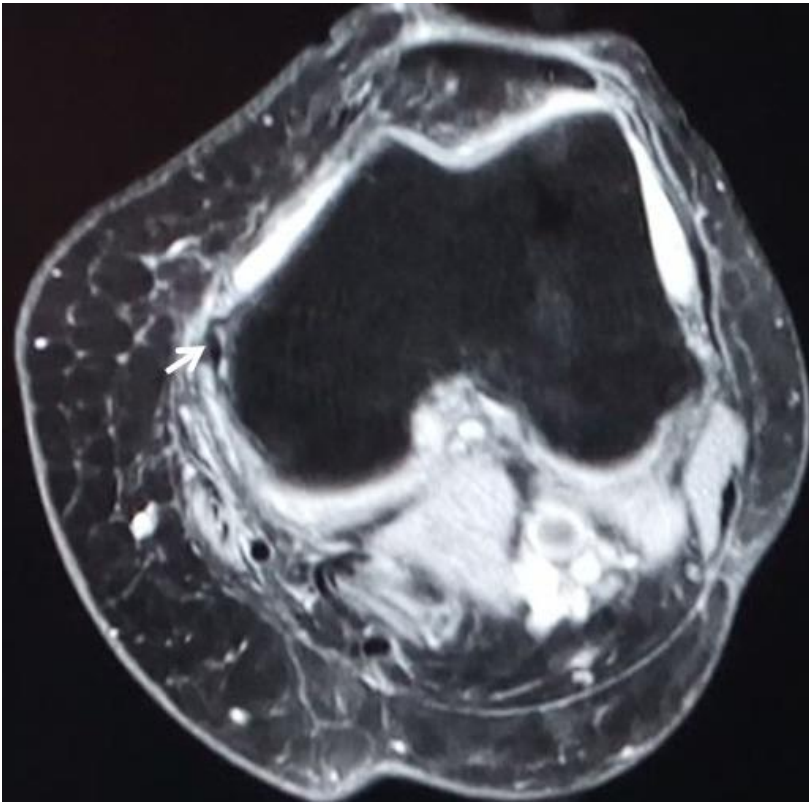


Figure 1: axial proton density (PD) weighted image of a 54-year-old woman right knee: MCL ossification (white arrow)



Figure 2: coronal PD weighted image of the same patient: upper part ossification of the of the right MCL (white arrow)

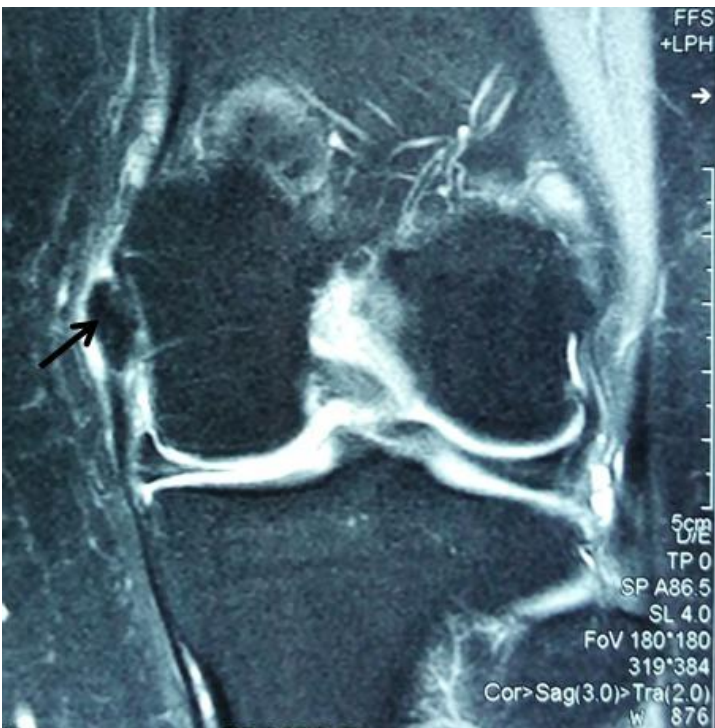


Figure 3: coronal PD weighted image of a 52-year- old man right knee: upper part ossification of the of the right LLI (black arrow)

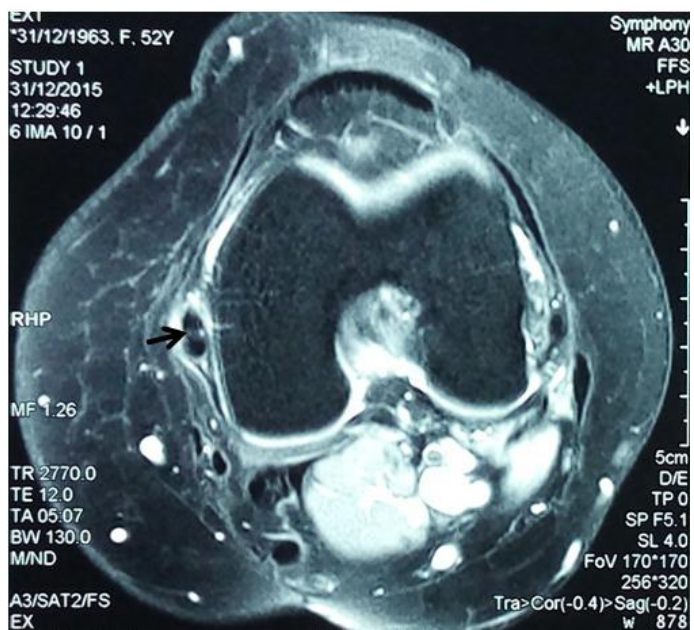


Figure 4: axial PD weighted image of the same patient: partial ossification of the of the right MCL (black arrow)



Figure 5: coronal view CT Scan of a 55-year-old woman left knee showing calcification in projection of the MCL (white arrow)



Figure 6: life like illustration in 3D reconstruction of the knee (white arrow)



Figure 7: post traumatic ossification of both MCL (white arrow)