

Isolated Proximal Fibular Stress Fracture In Osteoarthritis Knee Presenting As L5 Radiculopathy

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What to Learn from this Article?

1. Pain due to isolated proximal fibular stress fracture can mimic the pain of a L5 radiculopathy.
2. Thorough clinical examination is required to differentiate the two pathologies.

Abstract

Introduction: Isolated proximal fibular stress fractures are rare and usually seen only in athletes and military recruits. Its occurrence with osteoarthritis of the knee is not documented. Diagnosis of stress fractures is not difficult, but they can mimic other pathologies at times.

Case Report: A 45-year-old male patient presented with pain and paresthesias in left lower thigh and leg. He was previously treated as L5 radiculopathy confirmed with lumbar spine magnetic resonance imaging (MRI). He received analgesics followed by nerve root blocks at another center. He was referred to our center for L4-5 root decompression. Due to atypical spine symptoms, leg radiographs and MRI was done, which showed isolated stress fracture of the left proximal fibula.

Conclusion: We conclude that isolated stress fractures of the proximal fibula can present as L5 radiculopathy. A high level of suspicion is required for diagnosis. MRI is the investigation of choice when in doubt.

Keywords: Fibula/injuries, fractures, stress/diagnosis, fractures, stress/etiology, osteoarthritis, knee, radiculopathy.

Introduction

Stress fractures are classified as fatigue fractures or insufficiency fractures. Fatigue fractures involve abnormal stress on the normal bone, as seen in athletes. Insufficiency fractures involve normal stress on a deficient bone, as seen in elderly and postpartum women [1]. Weight distribution through the fibula is only 6.4% [2]. Hence, isolated stress fractures of the fibula are rare. Isolated fibular stress fractures are seen in athletes, especially in track runners and majority of them located in the lower third of fibula [3]. Its occurrence in proximal third is rare and has been reported in young athletes and young military recruits [4]. Its isolated occurrence with osteoarthritis of the knee has not been reported to the best of our knowledge. At times stress fractures can mimic other pathologies like tumors [5] and osteomyelitis [6]. We report a

case of unilateral stress fracture of proximal third of fibula in a sedentary person with varus osteoarthritis knee, mimicking radiculopathy.

Case report

A 45-year-old gentleman, the clerk by occupation, presented to us in the OPD with pain in the lower half of posterolateral aspect of left thigh travelling down the lateral aspect of leg till ankle since 3 months. The pain was insidious in onset and gradually progressive, worse since a month. He had worsening of pain on taking a few steps and needed to sit after walking 50 m. He did not have any pain when sitting or lying down. He complained of mild paresthesias in left lateral aspect of leg on walking. He did not complain of numbness. There were no symptoms in the right lower limb. He did

Author's Photo Gallery



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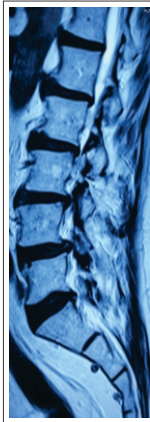


Figure 1: T2-weighted magnetic resonance imaging left paracentral sagittal section showing herniation of L4-5 disc.

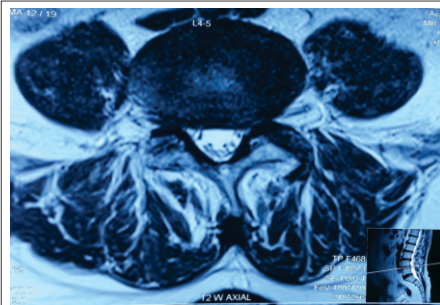


Figure 2: T2-weighted magnetic resonance imaging axial section at L4-5 disc level showing bilateral severe lateral recess stenosis with hypertrophied left superior facet process



Figure 3: Clinical picture showing varus deformity of the left knee.



Figure 4: Standing anteroposterior radiograph of the left knee showing features of osteoarthritis. Callus is seen in the proximal third of the fibula.

not have any back pain. There was no history of recent more than usual physical activity or trauma. For the last 1-month he was being treated by a local doctor as L5 radiculopathy. He was on oral non-steroidal anti-inflammatory drugs and pregabalin, with temporary and partial relief. Magnetic resonance imaging (MRI) (Figs. 1 and 2) ordered by the same local doctor, due to resistant symptoms, showed diffuse disc bulge at L4-5 and lateral recess stenosis. He was later given transforaminal nerve root block at his local center with no relief. He had taken a course of injectable vitamin D3 without prior estimation of its serum levels. He was finally referred to our center for surgical L4-5 root decompression. On clinical examination at our center, the patient had tenderness at the lateral aspect of proximal left leg. There was a pain on compression, bringing the fibula closer to tibia. The left knee had a varus deformity (Fig. 3). Knee joint examination revealed medial joint line tenderness and crepitus on a range of motion testing. There was no joint laxity and the knee range of motion was full. The patient had an antalgic gait. The spine and neurological examination was within normal limits. There was no thickening of the common peroneal nerve at the fibular neck. On percussion at the fibular neck, Tinel's sign was negative. As, the signs were not clearly indicative of spinal or peripheral nerve pathology and the presence of localized tenderness in the leg; we got radiographs of the left leg done. They revealed callus formation at the junction of proximal and middle third of fibula along the posterior and lateral cortex (Figs. 4 and 5). MRI of the leg revealed the fracture line along with periosteal edema and marrow edema (Fig. 6a and b). There was no evidence of any soft tissue on MRI (Fig. 7).

Discussion

Isolated stress fractures of the proximal fibula are rare occurrences. Reports mentioned in English literature involve athletes and military recruits [4]. Amongst stress fractures in athletes, fibula ranks third, with an incidence ranging from 6.6% to 21% where lower third of fibula is the most common site [3]. In athletes proximal fibular stress fractures are uncommon. In the largest published series of fifty isolated fibular stress fractures in athletes by Devas and Sweetnam [3], there were none in the proximal third of the fibula. Of peculiar note is the exclusive report of high-stress fractures of the fibula in 48 military recruits performing a full knee bend squat-jumping. The authors reported cessation of the occurrence of cases after this particular exercise was stopped [4]. The injury mechanism involves a combination of compression loading, biceps femoris contraction, and shear fatigue [7]. Our patient was an ordinary gentleman with a desk job. He was not involved in any such activities. The only possible risk factor he had was unilateral osteoarthritis of the knee with a varus deformity. Stress fractures in osteoarthritis of the knees are known to occur in the tibia and to a lesser extent in tibia and fibula together. Obesity and malalignment have been implicated as the cause of stress fractures in osteoarthritis [8]. An initial proximal fibula stress fracture followed by tibial stress fracture in an osteoarthritic knee was reported by Cheung et al. [1]. Their patient had a significant valgus deformity of the knee as compared to our patient who had varus deformity. They postulated that the loss of the lateral support provided by the fibula resulted in abnormal eccentric loading of the tibia, causing tibial stress fracture. Mullaji and Shetty described 36 patients with stress fractures in osteoarthritis with an incidence of



Figure 5: Standing lateral radiograph of the left leg showing callus formation in the proximal fibula. A faint fracture line is also seen.

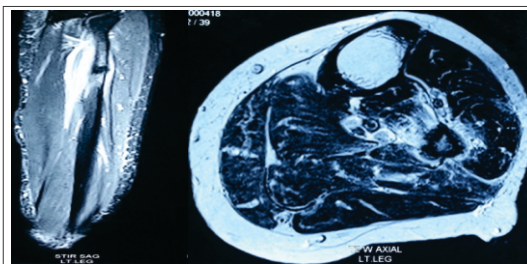


Figure 6: Magnetic resonance imaging image (a) short tau inversion recovery sequence, sagittal section showing the fracture line along with marrow edema and periosteal edema. (b) T2-weighted axial section at the level of the stress fracture showing irregular endosteal and periosteal surface with marrow and periosteal edema.

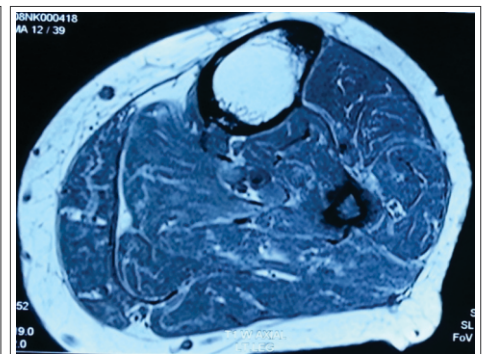


Figure 7: T2-weighted axial section at the level of the stress fracture showing the absence of any soft tissue.

1.4%. The majority of the patients had varus knees. But, their series did not have any isolated proximal fibular stress fractures [8]. There is absence of literature describing the stress and strain on the fibula in relation to magnitude of malalignment in the knee joint. However, extensive review of the lower limb neuromuscular alterations associated with osteoarthritis of knee during walking has shown increased co-contraction, amplitude, and duration of activity of lateral knee muscles regardless of disease severity, magnitude of limb alignment or medial joint laxity [9]. Thus, we believe that increased shear forces on the fibula due to the varus malalignment of the knee joint coupled with repetitive excessive contraction of the lateral knee muscles lead to the stress fracture in the proximal fibula.

The diagnosis of stress fractures is not very difficult. Sudden increase in pain with point tenderness at fracture site usually gives away the diagnosis [8]. However, at times the symptoms are vague and misleading. Stress fractures have been confused with worsening of arthritis [8], osteomyelitis [6], and even malignancy [5]. In case of suspicion, MRI is the investigation of choice. Woods et al. [10] have described the MRI features of fibular stress fractures. MRI shows periosteal edema and bone marrow edema within the fibula. Periosteal reaction is the most common located

on the lateral cortex. Stress fractures presenting as radiculopathy have been reported with sacral stress fractures [11]. In our case, the patient's symptoms were attributed to L5 radiculopathy which was erroneously substantiated by an ever-misleading MRI of the spine. The presence of local tenderness and an antalgic gait was the clue to an alternative explanation for the presence of pain. Thorough clinical examination and judicious use of imaging revealed the true diagnosis.

Conclusion

Isolated proximal fibular stress fractures are rare in general population and hence index of suspicion is low. It may mimic L5 radiculopathy. The prior knowledge amongst physicians can help avoid missed or delayed diagnosis and even unnecessary spinal surgery. A thorough physical examination and radiographs can establish its diagnosis. MRI is imaging of choice when in doubt.

Clinical Message

There are multiple masqueraders of spinal symptoms and isolated proximal fibular stress fracture is one of the rare causes. A thorough clinical examination and thoughtful relevant investigation is paramount. MRI of the spine should always be seen in the light of symptoms and signs.

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