Case Report

DOI: 10.7860/JCDR/2026/85434.23852

Unveiling Hidden Fractures: A Case Report on Proximal Tibial Stress Injury

Orthopaedics Section

VS AMBRISH[1], M MURALIKRISHNAN[2]

ABSTRACT

Proximal tibial stress fractures are not common and can be missed in the earlier stage, especially when the radiographs are normal. Patients may present with vague knee pain without a history of major trauma, which may delay in diagnosis. The present case report describes a 55-year-old woman who presented with persistent left knee pain and difficulty in bearing weight for 10 days following a minor workplace injury. She had a past history of corticosteroid use. Clinical examination and investigations were done and Magnetic Resonance Imaging (MRI) confirmed a proximal tibial stress fracture. She was treated conservatively with strict non weight-bearing, long knee orthosis support, analgesics, and a short course of inj. teriparatide along with calcium and vitamin D supplementation. The patient improved gradually, and follow-up radiographs at eight weeks and four months showed satisfactory healing with return of normal function. This case highlights the need to consider proximal tibial stress fracture in patients presenting with persistent knee pain after minor trauma, need to consider the proximal tibia stress fracture and emphasises the role of early imaging and appropriate conservative management.

Keywords: Conservative management, Immobilisation, Knee pain stress fracture, Workplace injury

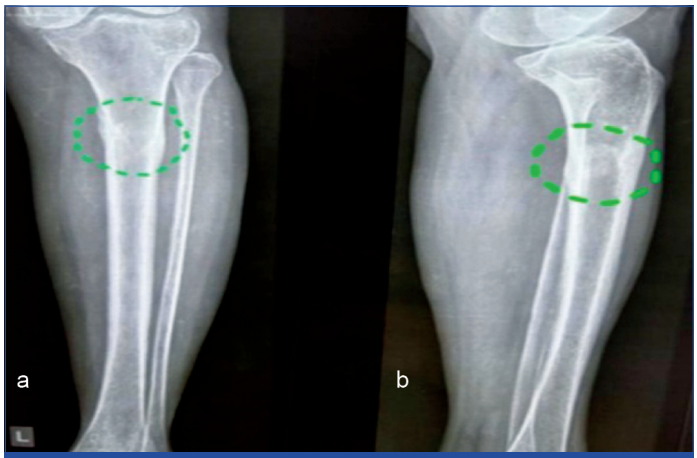
CASE REPORT

A 55-year-old female came to the outpatient department with diffuse pain in the left knee and difficulty in bearing weight for 10 days. The onset was after a minor workplace injury and gradually increased over a period of time. There was a mild pain initially but gradually progressed over the next few days, which made walking difficult. The pain was dull aching in nature and aggravated by walking, prolonged standing, and on weight-bearing. It was relieved at rest. Over the last few days, she was unable to bear weight on the affected limb. There was no recent history of major trauma, twisting injury, fall from height, or high-impact injury. There was also no associated swelling, redness, fever, or any other constitutional symptoms such as weight loss or loss of appetite and no history of any other joint pain. She had a past history of significant use of systemic corticosteroid therapy during a COVID-19 infection five years ago and no history of diabetes mellitus, inflammatory joint disease, or previous fractures.

On clinical examination, tenderness was over the proximal tibia with painful restriction of range of movements over knee. There was no gross deformity or instability. Routine laboratory blood investigations such as complete blood count are done and it is within normal limits. Serum calcium was 8.4 mg/dL and vitamin D was 22 ng/mL, bone mineral density t score -1.5 (osteopenia). Plain radiography of the left knee anteroposterior and lateral view suggested a subtle cortical thickening over the proximal one third of the tibia [Table/Fig-1a,b]. MRI confirmed a stress fracture involving the proximal tibial metaphysis [Table/Fig-2,3].

Based on the history of persistent knee pain following minor trauma and difficulty in weight-bearing, the following differential diagnoses were considered: stress fracture of the proximal tibia, occult tibial plateau fracture, bone contusion, early osteoarthritis exacerbation, osteonecrosis of the tibial plateau and septic arthritis (less likely due to absence of systemic features).

Initial plain radiographs of the left knee were normal and did not show any obvious fracture. There was no fever, swelling, or raised inflammatory markers, making an infective cause unlikely. However, MRI of the left knee revealed a linear fracture line in the proximal tibial metaphysis with surrounding bone marrow oedema, suggestive of a stress fracture. Therefore, based on the clinical findings and MRI

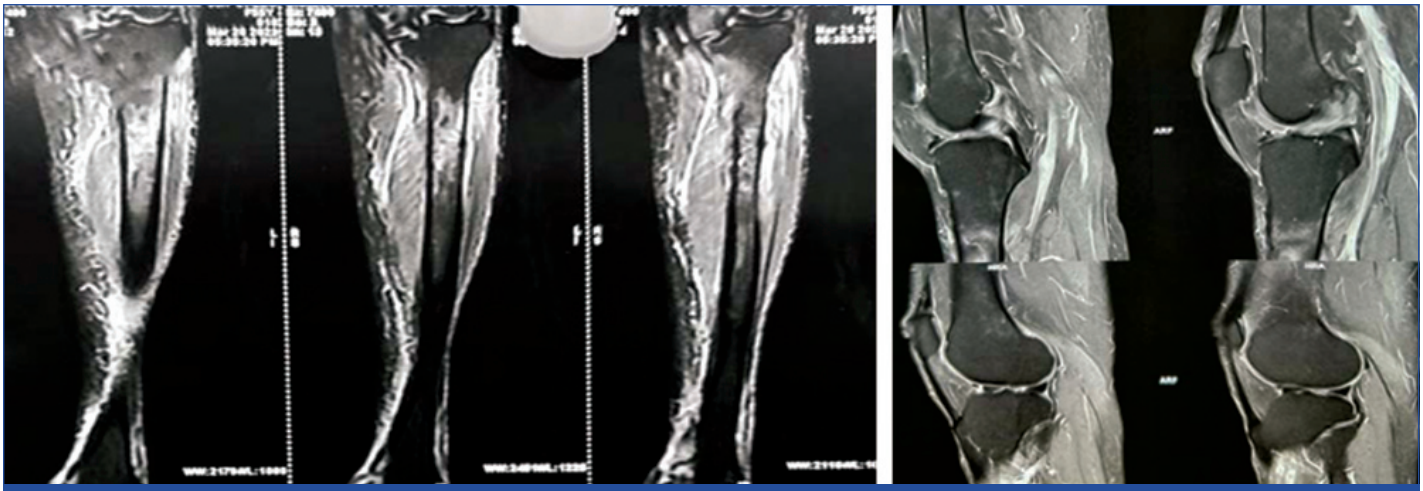


[Table/Fig-1]: X-ray of left tibia showing subtle cortical thickening noted in both anteroposterior (a) and lateral (b) views.

features, a diagnosis of proximal tibial stress fracture was made. She was advised to be in strict non-weight-bearing for eight weeks, with a long knee orthosis to reduce stress over the proximal tibia and prevent a complete fracture. Immobilisation and protected weight-bearing were continued until symptomatic improvement was noted. Conservative treatment was considered appropriate as the fracture was non displaced. Analgesics were prescribed for pain control in the form of Tablet Paracetamol 650 mg three times daily as needed. A short course of a non steroidal anti-inflammatory drug (Tablet Etoricoxib 60 mg once daily after food for five days) was also given for additional pain relief.

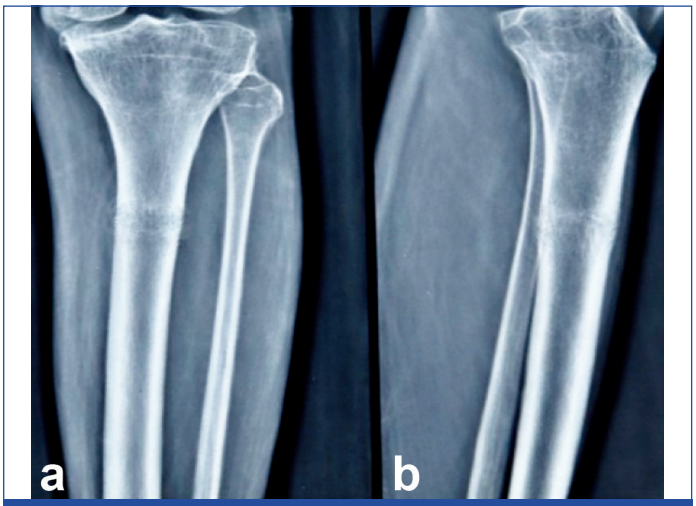
In view of suspected reduced bone quality and delayed healing risk, the patient was started on Inj.Teriparatide 20 micrograms administered subcutaneously once daily for 24 months. The injections were given in the abdominal wall using a prefilled pen device. Adequate calcium (1000 mg/day) and vitamin D3 (60,000 IU weekly for six weeks) supplementation were also advised to support bone healing.

The patient demonstrated gradual clinical improvement. At eight weeks, follow-up radiographs showed complete osseous healing, and she resumed ambulation without pain.

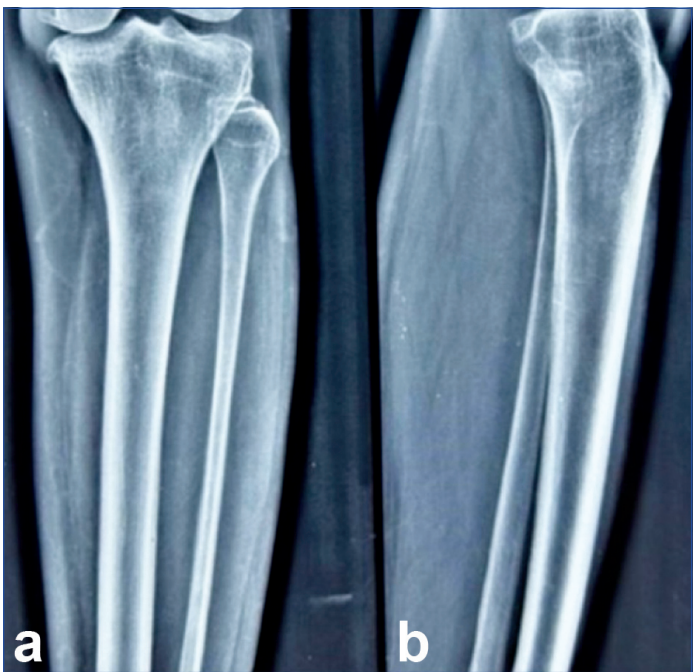


[Table/Fig-2]: (Left) and **[Table/Fig-3]:** (Right) the initial MRI of left knee confirmed the presence of the proximal tibial stress fracture.

[Table/Fig-4a,b] and [Table/Fig-5a,b] show follow-up radiographs demonstrating complete osseous healing at eight weeks and four months, respectively.



[Table/Fig-4a,b]: Follow-up X-ray of left tibia at eight weeks showing healing of proximal tibial stress fracture in anteroposterior: (a) and lateral (b) views.



[Table/Fig-5a,b]: Follow-up X-ray of the left knee at four months in anteroposterior (a) and lateral (b) views showing completely healed proximal tibial stress fracture.

DISCUSSION

Stress fractures occur when repeated mechanical stress exceeds the bone's ability to remodel [1,2].This leads to accumulation of microdamage and may progress to cortical disruption if not recognised early with radiographic evaluation. The tibia is commonly involved because it bears axial load during regular routine activities [3]. Although frequently described in athletes, stress fractures are also seen in middle-aged and elderly patients, especially in those with decrease in bone mineral density or with other risk factors [4].

Advancing age, prolonged corticosteroid use, nutritional deficiencies, and repetitive occupational strain are recognised predisposing factors for tibia stress fracture [4,5]. Corticosteroids impair bone health by suppressing osteoblast activity, enhancing osteoclast-mediated resorption, and reducing intestinal calcium absorption [5]. In the present case, previous steroid exposure along with occupational stress may lead to the development of the fracture.

Diagnosis is challenging in the early stage, as initial radiographs may be normal with no fracture line. MRI is useful in such situations, as it can detect bone marrow oedema and subtle fracture lines before changes become evident on plain X-rays [6]. In the present case, MRI confirmed the diagnosis.

Non displaced stress fractures are usually managed conservatively with rest, immobilisation with knee orthosis, analgesics may help in gradual return to normal activity [7]. In this case, strict non weight-bearing and orthotic support was given. Inj. Teriparatide was added considering underlying osteopenia. The patient showed progressive improvement, and complete clinical and radiological healing was noted at four months.

Proximal tibial stress fractures have been reported in middle-aged and elderly patients, often without a significant history of major trauma. In several cases, diagnosis was delayed because symptoms were mild and initial radiographs appeared normal with no fracture [1]. MRI is helpful in such situations, as it can detect early marrow oedema and subtle fracture lines when X-rays are normal [3].

Reduced bone mineral density and prior corticosteroid use have been identified as important risk factors in maintaining the bone health [4,5]. These factors may increase susceptibility to stress injury even after minor trauma. In the present case, persistent pain despite normal radiographs prompted further evaluation with MRI, which confirmed the diagnosis. Conservative management with strict non weight-bearing and immobilisation resulted in satisfactory clinical and radiological healing.

CONCLUSION(S)

Persistent knee pain with inability to bear weight even after minor trauma should raise suspicion of a proximal tibial stress fracture, when initial radiographs are normal. In this patient, MRI confirmed the diagnosis. Non weight-bearing and immobilisation resulted in good clinical and radiological healing. Early recognition with appropriate conservative management was essential for the favourable outcome.

REFERENCES

[1] Bergman R, Kaiser K. Stress Reaction and Fractures. 2025 Apr 3. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan–. PMID: 29939612.

[2] Yates B, White S. The incidence and risk factors in the development of medial tibial stress syndrome among naval recruits. Am J Sports Med. 2004;32(3):772-80. Doi: 10.1177/0363546503261729.

[3] Franklyn M, Oakes B. Aetiology and mechanisms of injury in medial tibial stress syndrome. World J Ortho. 2015;6(8):577-89. Doi: 10.5312/wjo.v6.i8.577.

[4] Hamstra-Wright KL, Bliven KC, Bay C. Risk factors for medial tibial stress syndrome. Br J Sports Med. 2015;49(6):362-69. Doi: 10.1136/bjsports-2014-093462.

[5] Ruohola JP, Laaksi I, Ylikomi T, Haataja R, Mattila VM, Sahi T, et al. Association between serum 25(OH)D concentrations and bone stress fractures in Finnish young men. J Bone Miner Res. 2006;21(9):1483-88. Doi: 10.1359/jbmr.060607.

[6] Winters M, Eskes M, Weir A, Moen MH, Backx FJG, Bakker EWP. Medial tibial stress syndrome can be diagnosed reliably using history and physical examination. Br J Sports Med. 2018;52(19):1267-72. Doi: 10.1136/bjsports-2017-098923.

[7] Barton CJ, Bonanno D, Carr J, Neal BS, Malliaras P, Franklyn-Miller A, et al. Running retraining to treat lower limb injuries: A systematic review. Br J Sports Med. 2016;50(9):513-26. Doi: 10.1136/bjsports-2015-095278.

PARTICULARS OF CONTRIBUTORS:

1. Junior Resident, Department of Orthopaedics, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India.
2. Assistant Professor, Department of Orthopaedics, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. VS Ambrish,
J 309, Thye Royal Castle Apartment, Thirumudivakkam, Chennai,
Tamil Nadu, India.
E-mail: ambrishbalakarthik2107@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Dec 18, 2025
- Manual Googling: Mar 19, 2026
- iThenticate Software: Mar 21, 2026 (1%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Dec 09, 2025**
Date of Peer Review: **Feb 06, 2026**
Date of Acceptance: **Mar 23, 2026**
Date of Publishing: **Jul 01, 2026**