

A Rare Case of Bilateral Tibial Plateau Insufficiency Fractures

Chee Chee Tang; Brigid Aherne; Haroon Rehman; David Boddie
FY2 NHS Grampian; CDF NHS Grampian; Trauma Orthopaedic Registrar; Trauma Orthopaedic Consultant

Introduction

Tibial plateau insufficiency fractures are very rare injuries that can result in significant morbidity and disability. The presentation can be very subtle. We report a rare presentation of bilateral tibial plateau insufficiency fractures in a patient taking long term psychotropic medications. We seek to draw attention to the significance of treating underlying causes in preventing further injury and complications, and challenges faced with our particular patient subgroup.

Patients and Methods

A 50-year-old male presented with a 4 week history of a painful left calf and the inability to weight bear, without any preceding trauma.

His past medical history included schizophrenia, chronic depression and a previous grand mal seizure and he was taking psychotropic medications such as paroxetine, amisulpride, carbamazepine and procyclidine.

He was initially investigated for deep vein thrombosis due to the non-traumatic nature of history and clinical presentation.

The knee radiographs then revealed a tibial plateau fracture. (Figure 1)



Figure 1: X-ray of the left knee on presentation

Ten days later the patient represented with a two day history of a painful right knee and inability to weight bear after falling from standing height.

Knee radiographs demonstrated a tibial plateau fracture, and an ipsilateral fibular neck fracture. (Figure 2)



Figure 2: X-ray of the right knee

Outcomes

The left knee was initially splinted with a hinged knee brace and an urgent total knee replacement (TKR) scheduled.

The right knee was first treated with an external fixator and again a TKR scheduled, however, the patient refused the right TKR.

A dual-energy X-ray absorptiometry (DEXA) 4 months after his initial presentation showed secondary osteoporosis where his bone density was lower when compared to individuals at his age and sex.

At 5 year follow up he had a walking distance of 5 metres with Zimmer frame despite good bilateral knee range of movement. The gait was significantly affected by right knee instability and knee valgus >30 degree.

Discussion

Fractures can occur from trivial trauma or even spontaneously in severely osteoporotic patients, and therefore insufficiency fractures are often not diagnosed. ¹

Clinical findings in tibial plateau insufficiency fractures are often non-specific and may be confused with osteoarthritis or osteonecrosis.

Delayed diagnosis can cause persistent pain to the patient and can lead to deformity of the knee joint, due to structural collapse. ²

The radiographic examination of an insufficiency fracture may be subtle, overlooked and misinterpreted. ³

Osteoporosis and frequent fractures are reported in schizophrenic patients, with osteopenia common among those patients receiving prolactin raising anti-psychotics. ⁴

The mechanism of action of anti-psychotics on bone results through an 'indirect pathway' via the hypothalamic-pituitary-gonadal axis and a theoretical 'direct pathway' on osteoblastic cells. ^{5,6}

Bilateral tibial plateau insufficiency fracture is extremely rare. We seek to draw attention to the significance of treating underlying causes in preventing further injury.

References

1. Evangelopoulos D, Heitkemper S, Eggl S, Haupt U, Exadaktylos A, Benneker L. Percutaneous cement augmentation for the treatment of depression fractures of the tibial plateau. *Knee Surg Sports Traumatol Arthrosc* 2010;18(7):911-915.
2. Manco LG, Schneider R, Pavlov H. Insufficiency fractures of the tibial plateau. *AJR.American journal of roentgenology* 1983;140(6):1211
3. Bae KC, Cho CH, Lee KJ, Jeon JH. Bilateral Medial Tibial Plateau Fracture after Arthroscopic Anterior Cruciate Ligament Reconstruction. *Knee surgery & related research* 2015;27(2):129.
4. Rady A, Elsheshai A, Elsheikh M, Eitawel M. Relation Between Long Term Antipsychotic Treatment and Osteoporosis. *European Psychiatry* 2015;30:1729-1729.
5. Bataille-Simoneau N, Gerland K, Chappard D, Basle MF, Mercier L. Expression of Prolactin Receptors in Human Osteosarcoma Cells. *Biochem Biophys Res Commun* 1996;229(1):323-328.
6. Graham SM, Howgate D, Anderson W, Howes C, Heliotis M, Mantalaris A, et al. Risk of osteoporosis and fracture incidence in patients on antipsychotic medication. *Expert Opinion on Drug Safety* 2011;10(4):575-602.