The Need for Advanced Imaging Modalities for Missed Anterior Calcaneal Process Fractures

Kevin Tootle DPM; Kyle Kinnamon DPM, FACFAS; Julio Ortiz DPM, FACFAS; Ashley Bowles DPM, AACFAS; Harshil Patel, DPM

Bethesda Health Podiatric Medicine and Surgery, Residency Program– Boynton Beach, FL

INTRODUCTION

Anterior calcaneal process fractures have been a misdiagnosis due to lack of advanced imaging needed to visualize pathology not readily seen on plain radiographs (6). The purpose of this study is to determine the incidence of negative plain radiographs and the need for advanced imaging to visualize fractures of the anterior process of the calcaneus in patients with persistent pain and high clinical suspicion after an ankle sprain or axial compression injury.

MATERIAL AND METHODS

A retrospective analysis of ten patients with clinical findings suggestive of an anterior calcaneal process fracture were reviewed. These ten patients underwent clinical and radiographic evaluation where all the ten patients who presented with pain over the anterior process of the calcaneus underwent plain radiographs as well as computed tomography evaluation or magnetic resonance imaging for further evaluation. Eight of ten patients were diagnosed with anterior process fracture using advanced modalities while two of the ten were identified with plain radiographs showed clear fracture on lateral x-rays. The mechanism of injury in eight of the ten patients were due to inversion injuries while one patient is secondary to motor vehicle accident and one patient due to fall from height. Two of the principal authors were heading the clinical evaluation and reading of all imaging including plain radiographs, CT and MRI.

RESULTS

Plain radiographs, CT scan and MRI were evaluated to determine the incidence of missed radiographic signs of anterior process fracture as well as the incidence of positive findings on CT or MRI to confirm clinical findings suggestive of this fracture pattern. Of the ten patients presenting with high clinical suspicion and indication of pain over the anterior calcaneal process indicating pathology or fracture, two of the ten patients had plain radiographs that were positive for fracture while six patients underwent CT and four patients underwent MRI evaluation which diagnosed an anterior process fracture in all patients.

DISCUSSION AND CONCLUSION

Anterior calcaneal process fractures are extremely difficult to visualize on plain radiographs and are diagnosed on clinical suspicion alone in many cases. Although advanced imaging is recommended in patients with negative radiographs and high clinical suspicion it is still not utilized to the extent in which we still are not seeing an increase in diagnosis of anterior process fractures. Using CT and MRI evaluation can lead to a decrease in misdiagnosis of these fracture patterns (2). Ten patients were retrospectively reviewed with an 80% incidence of misdiagnosis of fractures of the anterior process of the calcaneus on plain radiographs and 20% of the patients showed a clear fracture on plain radiographs seen on lateral images. These findings show the need for combining CT or MRI studies with radiographs to unequivocally reach an appropriate diagnosis and treatment plan.

REFERENCES