

Virtual fracture clinic management of fifth metatarsal, including Jones', fractures is safe and cost-effective



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ABSTRACT

Virtual clinics have been shown to be safe and cost-effective in many specialties, yet barriers exist to their implementation in orthopaedics. The aims of this study were to look at whether the management of 5th metatarsal fractures using a virtual fracture clinic model is safe, cost effective and avoids adverse outcomes whilst being acceptable to patients using the service.

All patients with a fifth metatarsal fracture between September 2013 and September 2015 had a standardised management plan initiated (blackboot, full weightbearing) in the emergency department (ED). 663 patients met inclusion criteria, 251 (37.5%) Type 1, 111 (17%) Type 2 (Jones'), 281 (42%) Type 3 or distal, 20 (3%) were misdiagnosed, and 4 (0.5%) patient's images were unavailable.

499 (75%) patients were discharged immediately, 47 (7%) had further imaging, 114 (17%) had either ESP or consultant clinic review, and 3 (<1%) transferred their care privately. The average number of clinic visits per patient was 0.17. At a conservative estimate of 1.3 visits per patient in a traditional pathway this saved 779 clinic visits with a cost saving of £60,000 on clinic visits alone. There were 8 (7%) asymptomatic non-unions in Type 2 (Jones') fractures. One patient required surgical intervention.

Fifth metatarsal fractures have excellent outcomes with conservative management yet traditionally have required clinic visits to confirm the diagnosis and explain the management and prognosis. Our study supports the use of a virtual fracture clinic model that is standardised, initiated in ED, that is both safe and cost-effective.

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Introduction

There is growing interest in developing safe and robust patient pathways whilst reducing costs. There is a balance to be struck however, between cost savings on the one hand and safe and effective care on the other. There has been a move towards virtual clinics in other specialties to try to reduce healthcare costs and provide patients with a more streamlined service [1–3]. The traditional model of fracture clinics is not ideal as these are often over or fully booked clinics with short appointment times where teaching and training opportunities are limited and management plans are often not consistent amongst treating clinicians [4]. A local audit of 93 patients seen in our unit's fracture clinic, prior to the virtual care pathway being started, revealed that 42 (45%) of patients required time off work to attend, 41 (44%) were discharged after one appointment, only 41 (44%) were given

advice on exercise and injury management with a satisfaction rate of 76%.

Metatarsal fractures are a common injury, with the fifth metatarsal being the most frequently fractured bone in the foot. The management of these injuries varies from fully weightbearing in elasticated supports to non-weightbearing in casts often depending on the treating clinician. This variability is likely due to the reported non-union rate of Jones' fractures, transverse base of fifth metatarsal fractures involving the fourth and fifth intertarsal joint [5]. These have traditionally been treated conservatively in non-weightbearing casts for 3–12 weeks with radiological and clinical follow-up until union [5]. Given that the natural history of these injuries is highly favourable with conservative treatment, is it still really necessary to see these patients in outpatient fracture clinics? A recent review article suggested that there is now sufficient evidence to treat patients with fifth metatarsal fractures with immediate weightbearing in a supportive orthotic [6] and that treatment in cast causes a significant delay in return to full function [7]. Even with this

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evidence now being adopted in many centres patients are treated in the emergency department (ED) with a backslab and made non-weightbearing until fracture clinic review. It can be up to 2 weeks therefore, before patients are reviewed in a clinic and this more functional management is instituted. This traditional management strategy costs the patient and hospital in terms of multiple clinic visits, cast changes and X-rays. Patients and employers lose in terms of time off work and loss of productivity and there is a small but significant environmental impact from the increased travel.

Due to the pressures on our local services we instituted protocols for these, and many other injuries, to be initiated in the emergency department with written information regarding their injury, management plan and contact details for problems. All patients are then referred to a central virtual fracture clinic (VFC) where their images are reviewed by trained extended scope practitioners (ESPs), who have consultant support daily for any concerns. All patients are then contacted via the telephone to triage and ensure quality control. In most circumstances this means definitive treatment is initiated at first point of contact (in ED), is standardised and patients have written information to refer to as well as point of contact should they run into problems. Patients can either be discharged with written advice, referred for further imaging, placed into an extended scope practitioner (ESP) led clinic or a subspecialty clinic.

The aims of this study were to look at flow through the system, cost savings, patient satisfaction, and adverse outcomes, as a result of a virtual fracture clinic for fifth metatarsal fractures. A secondary aim was to compare outcomes for the subgroup of patients with Jones' fractures to see if this is subset is also suitable for a VFC model.

Patients and methods

Our unit is a level one trauma centre caring for a local population of 600,000 but providing tertiary level services to 1.5 million in a publicly funded healthcare system (National Health Service, UK). Local audit committee approval was obtained but as this was a clinical audit no research ethics committee approval was required. Inclusion criteria were all patients with an actual or suspected fifth metatarsal fractures. All patients attending the ED

with a suspected foot fracture were assessed by ED clinicians and had standard anteroposterior, oblique and lateral foot x-rays for diagnosis. Patients were then referred to the on-call orthopaedic service if there was a concern regarding the injury or were referred directly to the VFC service using agreed protocols. They were managed using a standardised protocol where they were told to weightbear as tolerated in a black boot orthosis and given crutches if required. Their images were then reviewed the next working day by a trained (ESP), working under the direct supervision of a named consultant, who sent them a letter detailing their diagnosis and mechanism of injury. They were also sent written advice sheets with information about their specific diagnosis, their management plan, their prognosis and contact details of the virtual fracture clinic and were encouraged to contact this clinic if they had any concerns or were not progressing according to the written advice sheet. Links to videos were also sent for exercise demonstration purposes.

Between September 2013 and September 2015 our virtual fracture clinic received 8500 referrals of which 1747 patients had foot injuries. 977 patients sustained metatarsal fractures with 663 meeting our criteria. Figs. 1 and 2 describe the traditional and VFC pathways. Minimum follow-up was 6 months. All x-rays were initially reviewed by the ESP and then re-reviewed by the lead author and classified according to the Lawrence and Botte classification [8]. Any concerns were raised with the senior author. The electronic patient record (EPR) (Symphony, EMIS healthcare, Leeds, UK) was used to gather demographic data on all patients. All complications were noted through interrogating the orthopaedic departments EPR (Bluespier, Worcestershire, UK) and the hospitals picture and archiving system (PACS, Philips IntelliSpace). Complications collected included delayed union, non-union, re-fracture, and need for surgical intervention. All patients with radiographically proven non-union were contacted via telephone to ascertain whether or not they were symptomatic from their fracture at latest review. The initial management plan was noted and the number of clinic visits each patient received was also noted.

A cost analysis was performed in collaboration with the hospital finance department to calculate the costs associated with virtual fracture clinic model when compared to the traditional model that had preceded it.

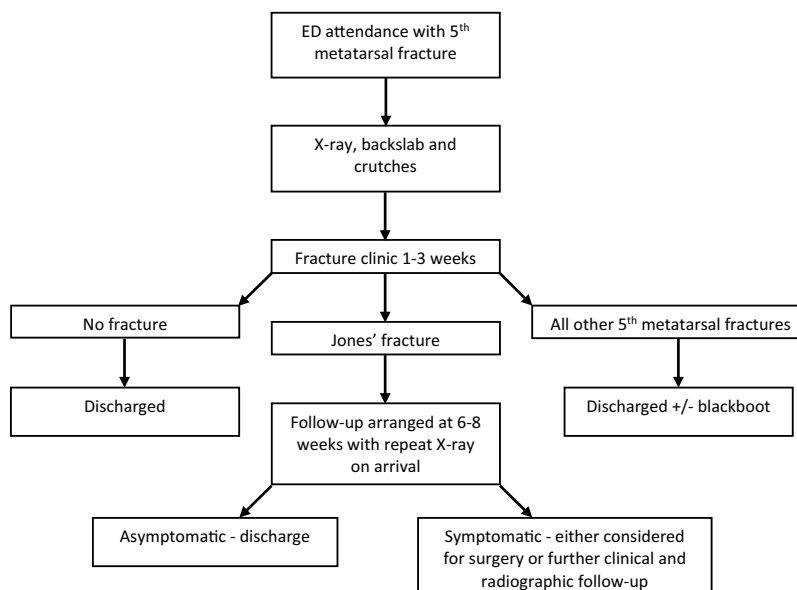


Fig. 1. Traditional pathway for management of fifth metatarsal fractures.

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