



Technical note

Guide wire placement for fifth metatarsal intra-medullary screw fixation: A technical tip



John Grice^{a,*}, James Calder^{a,b}

^a Fortius Clinic, 17 Fitzhardinge Street, London W1H 6EQ, United Kingdom

^b Imperial College London, Musculoskeletal Surgery Academic Department, South Kensington Campus, London SW72AZ, United Kingdom

HIGHLIGHTS

- It can be difficult to pass a guide wire across a partially occluded medullary canal.
- A blunt angled guide wire can facilitate crossing the callus.
- Good guidewire position will reduce surgical complications.

ARTICLE INFO

Article history:

Received 23 February 2016

Received in revised form 22 May 2016

Accepted 25 May 2016

Keywords:

Fifth metatarsal
Fracture
Screw
Technique

ABSTRACT

Treatment of fifth metatarsal fractures in elite athletes or delayed/non unions often requires operative fixation. However, this can cause technical difficulties and we present an operative tip to avoid complications is presented.

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1. Introduction

Treatment of fifth metatarsal fractures in elite athletes or delayed/non unions often requires operative fixation [1]. Good clinical results are reported following fixation with an intra-medullary compression screw [2].

Difficulty may arise when attempting to pass a guide wire prior to cannulated reaming for fixation of the fractured fifth metatarsal if anatomical orientation is not appreciated. The curvature of the metatarsal shaft may lead to a guide wire exiting the medullary canal making the remainder of the operation difficult. Additionally, cross bridging of callus at the fracture site as a stress response in Torg stage II or III, may narrow or obliterate the medullary canal [3]. This bony block can deviate the guide wire resulting in perforation of the cortex. Optimal positioning of the guide wire is crucial to allow adequate screw fixation and prevent complications and re-

fractures [4,5]. A technique to facilitate accurate intra-medullary positioning of the guide-wire and subsequent screw fixation is presented.

2. Technical tip

Under image intensifier (II) control a guide wire is placed through a stab incision at the optimal entry point (dorso-medial) at the base of the fifth metatarsal (Fig. 1). It is drilled into the medullary canal for approximately 10 mm and this entry point then reamed with a cannulated drill and the guide wire removed. The blunt end of a 2 mm Kirschner-wire (K-wire) is pre bent to an angle of approximately 20° (Fig. 2). This blunt end is then introduced into the widened entry point of the metatarsal under II control and rotating the wire enables the 20-degree bend to be guided along the canal rather than heading towards the far cortex (Fig. 3). Tapping the blunt end down the canal using a T-handled chuck avoids perforation of the far cortex that can occur when using a power-driven sharp-ended wire (Fig. 4). Once the wire is in the optimal position the canal is reamed with a cannulated drill and screw fixation per-

* Corresponding author.

E-mail address: John.grice@fortiusclinic.com (J. Grice).



Fig. 1. Positioning of the proximal entry point of the wire.

formed in a standard manner (Fig. 5). If a cannulated screw is used the bent K-wire is exchanged for the initial guide wire.

3. Discussion

Passing a guide wire down the centre of the medullary canal is an essential technique in surgical fixation of a fifth metatarsal frac-

ture. In chronic injuries it may be difficult to pass the wire because in Torg stage II injuries sclerotic bone may narrow the medullary canal [3] making it imperative to use the angled tip to engage the canal before its advancement with the hammer. In stage III injuries when the medullary canal is obliterated [3] it may be necessary to open the fracture site and pass the guidewire under direct vision. In these cases, or if bone graft is required, a 10 mm incision can be

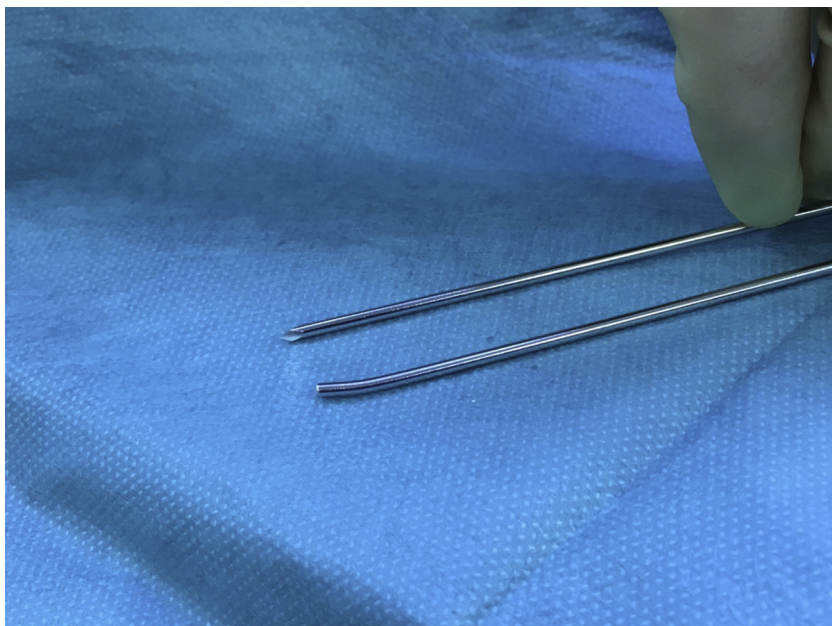


Fig. 2. K-wires demonstrating the 20-degree bend in the blunt.

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