

A technical note on a Major Intra-operative Complication during prophylactic nailing of the Intact Femur - Shaft Penetration

Mark G Williams¹, Ashraf Awad¹,

Abstract

Intramedullary nails are principally designed for trauma patients to permit fixation of proximal femur or femoral shaft fractures. Prophylactic femoral nailing is a frequently employed technique for the fixation of impending pathological fractures. We describe the major intraoperative complication of anterior shaft perforation in the intact femur. We encountered perforation of the distal anterior femur in three patients undergoing prophylactic femoral nailing utilising the 11mm Gamma locking intramedullary Nail System (Stryker) and report our experience in terms of technical tips for preventing this complication

Keywords: prophylactic intramedullary nailing, perforation, complication

Background

G. Küntscher, in 1939 introduced the principles of fracture fixation utilising a intramedullary nail which was the full length of the canal and inserted distant to the fracture site. Later, by the 1970s Grosse and Kempf had devised an open section nail with holes today for screws; the interlocking nail [1]. Prophylactic femoral nailing is a frequently employed technique for the prevention of impending pathological fractures. We describe the major intraoperative complication of anterior shaft perforation in the intact femur. We encountered perforation of the distal anterior femur in three patients undergoing prophylactic femoral nailing utilising the 11mm Gamma locking intramedullary Nail System (Stryker), see Figure 1.

Technique

To avoid this complication in future cases, we recommend locating an entry point in the tip of the greater trochanter at the junction between the anterior third and posterior two-thirds[2]. Whilst software exists to predict the optimal entry point many surgeons will not have access.[3] During insertion, the guide-wire tip and nail must be directed posteriorly, and lateral views of the distal femur are screened during wire and nail placement.

Discussion

During nailing for trauma, slight bone displacement at a

fracture site allows a rigid nail to be accommodated centrally in the distal femur. Whilst the radius of curvature of the nail matches the bow of most femurs, nailing an intact femur can on occasion result in the nail perforating the distal femur. In narrow or excessively bowed intact femurs, surgeons should consider employing a nailing



Figure 1: a-c: Anterior placement of the 11mm intramedullary nail in the distal femur in three patients.

system with a more flexible nail of smaller diameter.

¹Department of Trauma and Orthopaedic Surgery, Torbay Hospital, South Devon Healthcare NHS Trust, Torquay. TQ2 7AA. United Kingdom.

Address for correspondence:

Dr. Williams M G,
Department of Trauma and Orthopaedic Surgery, Torbay Hospital,
South Devon Healthcare NHS Trust, Torquay. TQ2 7AA. United
Kingdom.
Email: m.williams13@nhs.net

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