



**Journal club:** 21 May 2013

**Attendees:** Mr J Rao, Mr M Nixon, Mr R Banim, Mr R Thonse, Mr M Webb, Prof J Harrison, Mr D Makki, Mr P Ralte, Mr J Paniker, Mr V Gedela, Mr K Vishwanathan, Mr S Pydah, Mr J Manara, Dr W Stockton, Dr G Lomas

The Countess of Chester Hospital, health park, Chester United Kingdom

**Theme: Lower limb trauma-** Perspectives on intramedullary nailing of proximal femoral fractures

**Roberts JW, Libet LA, Wolinsky PR.** Who is in danger? Impingement and penetration of the anterior cortex of the distal femur during intramedullary nailing of proximal femur fractures: preoperatively measurable risk factors. *J Trauma Acute Care Surg* 2012;73:249-54.

**Reviewer:** Mr D Makki

### **Summary:**

**1-Purpose:** To identify preoperative detectable risk factors for femoral nail impingement and penetration. The authors hypothesised that nail tip impingement occurs with increased femoral bows. They evaluated pre- and postoperative radiographs of patients treated with long intramedullary femoral nails and identified variables that lead to nail tip impingement.

### **2- Patients and methods**

The authors carried out a retrospective review of medical and radiological records of 150 patients treated with long femoral nails for proximal femoral fractures over a 4-year period. They excluded those treated with short nails, pathological fractures, ipsilateral distal femoral fractures, pre-existing femoral deformities and those with inadequate x-rays. Preoperative radiological measurements included the femoral angle of incidence (AI cortex and canal), diameter and cortical thickness. The type of nail, nail length, diameter and entry point were also recorded. The position of nail tip within the distal femur was evaluated postoperatively and patients were therefore divided into anterior, middle and posterior third groups accordingly. Patients who had nail impingement or penetration were evaluated against anatomic and surgical variables and compared with all other groups.

### **3-Results:**

Factors that were associated with anterior one third nail tip position and cortical impingement included femoral angle of incidence, nail length and entry point. Nail length and patients' stature correlated inversely with cortical impingement. Posterior nail starting point led to anterior nail tip position but not impingement. Nail curvature had no impact on impingement.

#### **4-Conclusion:**

The Likelihood of cortical impingement is 63% if AI Cortex >10 degrees, 49% if patients <160 cm in height and 85% if both of these risk factors are present.

#### **5-Critique:**

##### **Strengths:**

The information tested in this paper is both valuable and practical. The Sample size is acceptable and there was a clear interpretation of correlation between risks and outcome measures

##### **Methodological concerns:**

There was no inter-observer reproducibility tested for radiographic measurements.

There was no standardised protocol for obtaining preoperative lateral radiographs.

No clinical outcomes have been measured with regards to the risk of cortical perforation in those who had anterior third nail tip position or impingement.

There were no data in relation to the type of proximal fixation (ante-grade or recon mode) as this would have a bearing on the nail starting point and the screw positioning within the femoral neck when a recon nail is used.

##### **Final thought**

This paper presents useful information that would have bearing on our practice. There are anatomic variants that we should be aware of preoperatively. Other variables such as the nail entry point and nail length are part of the surgical technique that we can control and address.

**Okcu G, Ozkayin N, Okta C, Topcu I, Aktuglu K.** Which implant is better for treating reverse obliquity fractures of the proximal femur: a standard or long nail? *Clin Orthop Relat Res* 2013; 471:2768-75.

**Reviewer:** W Stockton

##### **Summary:**

**1-Purpose:** To identify whether nail length has any impact on healing when using intramedullary nails for fixation of reverse obliquity fractures of the proximal femur. The authors identified that the use of intramedullary nails has advantages over the use of the lag screw due to better load bearing capacity, but there is little evidence as to whether nail length has any effect on healing.

## **2- Patients and methods**

The authors carried out a prospective randomised control trial, following up 40 patients with a reverse oblique proximal femoral fracture, who were randomised to either a standard or long (>33cm) intramedullary nail. The 40 patients excluded those with pathological fractures, previous femoral fractures, open fractures, polytrauma with an Injury Severity Score of greater than 16. 33 of the 40 patients were followed up for between 12 to 20 months post-operatively (7 patients died within 1 year, none were lost to follow-up). The outcome measures assessed at follow-up include: reoperation rate, 1-year mortality, function and mobility (using the Parker-Palmer mobility score and Harris Hip score), union rate, and tip-to-apex distance. Neither the patients nor operating surgeons were blinded to the length of nail used, but the clinician carrying out the post-operative assessments was blinded to the nail length the patient had received.

### **3-Results:**

Two of the forty patients had complications requiring re-operation (both within the long nail group). There was no difference of statistical significance between the two groups in the other outcome measures.

### **4-Conclusion:**

There is no clinical advantage in using a long intramedullary nail over a standard length intramedullary nail for fixation of reverse oblique proximal femoral fractures.

### **5-Critique:**

#### **Strengths:**

The article identifies itself as a pilot study, recognising the low patient numbers included in the study. Despite this, it raises an interesting point that has not previously been considered in published literature about whether the length of intramedullary nail used has any clinical benefit for fixation of reverse oblique proximal femoral fractures.

#### **Methodological concerns:**

The study had small patient numbers without use of priori power to determine how many patients would be required to ascertain a statistically significant result.

The follow-up period was relatively short, with mean follow-up period of 14 months

The study utilises the Parker-Palmer score for measuring outcome related to patient function and mobility, however this score was originally devised for approximating 1 year mortality following hip fracture, and there is no literature appraising it for use as a follow-up tool.

The study only considers one type of intramedullary nail system (the Proximal Femoral Nail-Antirotation, Synthes, Switzerland)

Patients are excluded who have a pathological proximal femoral fracture, but the authors fail to elaborate on whether this includes osteoporotic fractures, which would form a relatively large percentage of patients with proximal femoral fracture.

### **Final thought**

This paper raises an interesting question that has not previously been considered within published literature. Despite small patient numbers, it would appear that there is no obvious clinical advantage to using long intramedullary nails over standard length nails for fixation of reverse oblique proximal femoral fractures; however the authors identify that this is a pilot study, and further research is needed to be certain of the statistical significance of this finding.