



The Journal of Bone & Joint Surgery

Journal club: 1 November 2012

Attendees: Mr A. Rao, Mr A.Khan, Miss A. Fishlock, Mr G. Hannant, Mr M. Blomfiled, Mr I. Abdulkareem, Mr H. Boon, Mr T. Papachristos, Mr A. Mora, Mr M. Panteli, Dr V. Jandu, Dr R. Hooper, Mr C. Fenton, Miss. R. Hallas, Dr F. Barnett, Mr R. Singh, Mr S. Morgan

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Theme: Trauma - Proximal Femoral Fractures

1. **Brammara TJ, Kendrewa J, Khanc RJK, Parker MJ.** Reverse obliquity and transverse fractures of the trochanteric region of the femur; a review of 101 cases. *Injury* 2005;36:851-7.
2. **Pajarinen J, Lindahl J, Michelsson O, Savolainen V, Hirvensalo E.** Pertrochanteric femoral fractures treated with a dynamic hip screw or a proximal femoral nail. A randomised study comparing post-operative Rehabilitation. *J Bone Joint Surg [Br]* 2005; 87-B: 76-81.
3. **Parker MJ, Bowers TR, Pryor GA.** Sliding hip screw versus the Targon PF nail in the treatment of trochanteric fractures of the hip: a randomised trial of 600 fractures. *J Bone Joint Surg [Br]* 2012;94-B: 391-7.

1. Reverse obliquity and transverse fractures of the trochanteric region of the femur; a review of 101 cases.

Reviewer: Mr M.Blomfiled

Summary

1. Purpose

Review of the outcomes in the management of reverse obliquity and transverse femoral fractures treated with either a sliding hip screw or an intramedullary nail.

2. Methods

Retrospective case review of 101 reverse oblique and transverse extracapsular femoral neck fractures between 1989 and 2001. Post-operative radiographs were assessed for quality of fixation. Tip apex distance, fracture union, complications and functional outcomes recorded. Follow up was in clinic or on the phone.

3. Results

Cut out was noted in patients with large tip apex distance. The operative time was longer for the IM nails. No other significant difference was noted.

4. Conclusion

Fractures with a greater amount of femoral medialisation had a higher failure rate, but IM nails were not shown to be superior in this study.

5. Critique

Strengths

- Large initial cohort of patients
- Standardised treatment protocol
- Intended outcome identified
- Clear indication of who was assessing the radiographs

Methodological Concerns

- Long duration of study with change in implant half way through
- No initial power calculation to aid sample size
- Uneven distribution of type of fixation
- Small number of patients available for final analysis

Final thought

Underpowered study to draw any significant conclusions but did identify areas for further investigation.

2. Pertrochanteric femoral fractures treated with a dynamic hip screw or a proximal femoral nail. A randomised study comparing post-operative Rehabilitation.

Reviewer: Mr G.Hannant

Summary

1. Purpose

Is a Proximal femoral nail (PFN) better than a Sliding hip screw for pertrochanteric fractures in terms of post-operative walking ability and place of residence? Previous studies had focused on long femoral nails.

2. Methods

This one centre prospective randomised ethically approved trial collected 108 patients with a low-energy extracapsular pertrochanteric fracture between October 1999 and February 2001. Those excluded from the study despite this fracture were those with a pathological fracture, multiple injuries, those unable to consent and those whom declined participation. Included patients were randomised using a sealed envelope technique into PFN or Dynamic hip screw (DHS). Each patient was classified as either 1) living in their own home 2) nursing home resident 3) institutionalised ie long stay hospital ward. Walking status was classified as 1) walking independently with up to 1 walking stick 2) independent with the help of crutches or a frame 3) assisted walking only. Operations were usually performed within 48hrs by mostly by a senior orthopaedic resident and were reduced closed with the operation performed to manufacturers recommended techniques. A standard post operative protocol regarding x-rays, thrombo-prophylaxis and mobilisation was followed for all patients. Primary outcome was a return to preinjury walking and living status. Secondary outcomes were radiological changes of the fracture and/or implant.

3. Results

54 patients were entered into each treatment option group and were comparable in their demographics and pre-operative states of mobility and living situation. Operatively the only statistically significant difference between the two groups was that then proximal femoral nail took longer to perform by a median difference of 10 minutes. 2 patients from each group required revision surgery due to re-displacement of the fracture. This and poor health and death limited the study to 21 withdraws leaving 41 Dynamic hip screw patients and 42 proximal femoral nail

patients left at four months for review of outcomes. There was no statistically significant difference in the return to previous place of residence between the two groups. The PFN group did return to their preoperative walking status better than the DHS group ($p = 0.040$). Secondary outcome review demonstrated a statistically significant mean femoral neck shortening in the DHS group ($p = 0.003$)

4. Conclusions

The authors believe that a PFN may favour better restoration of function in the elderly population, compared with the use of a DHS. One explanation might be the significantly greater impaction of the fracture in the DHS group, with shortening of the femoral neck.

5. Critique

The study aimed to determine if a PFN is better than a DHS at restoring walking ability and returning patients to their previous living residence when treating a pertrochanteric fracture but did not determine this conclusively although their evidence supports improvement in walking ability with the PFN

Strengths

- A clear clinical question asked
- A prospective randomised trial
- Fair inclusion and exclusion criteria
- Excellent end points

Methodology concerns

- No power calculation with the study
- No objective scoring system used

3. Sliding hip screw versus the Targon PF nail in the treatment of trochanteric fractures of the hip: a randomised trial of 600 fractures.

Reviewer: Mr IH Abdulkareem

Summary

1. Purpose

A randomised trial conducted between April 2002 and November 2009, to compare the Targon Proximal Femoral (PF) Nail with the Sliding Hip Screw (SHS), in order to determine which method of surgical fixation of intertrochanteric femoral fractures is superior.

2. Methods

Patients with trochanteric fractures were randomised to surgical treatment with either the SHS or the Targon PF Nail. Inclusion criteria: any trochanteric fracture admitted during the study period. Exclusion criteria: subtrochanteric fracture extension requiring >5 hole side plate, previously fixed fractures, fractures treated conservatively, patients who declined inclusion, demented patients with no next of kin available to consent, patients with significant OA recommended for THR, and patients treated in the absence of the lead investigator (MJP) to supervise the surgery. Ethical approval was obtained from the relevant hospital and research committees.

3. Results

A total of 598 patients with 600 fractures were treated, with 300 being allocated to each arm of the trial. There were 121 men and 479 women, with a mean age of 82 years (26-104). There were no statistically significant differences in outcomes between the two groups. The PF Nail was technically more demanding to insert, but there was a tendency to regain mobility faster for those treated in this group compared to the SHS group.

4. Conclusions

Both methods of fixation produce comparable results. However, IM nail insertion was technically more demanding and took longer to insert. However there was a tendency for patients treated with an IM nail to regain better mobility.

5. Critique**Strengths**

Prospective randomised trial.

Clear inclusion and exclusion criteria demonstrated.

There were clearly defined outcome measures.

Very good and clear statistical methods used (intention to treat analysis, power calculation and p values)

Blinding of the assessor during the follow-up period

The study and follow-up period was clearly defined and adequate (2002-2009)

Methodological concerns

The randomisation method was not very clear, it seems to be consecutive (Did they consider other methods like simple systematic, or computer assisted random sampling, and why not?)

All operations were performed by one surgeon in one centre only (Multi-centred randomised trials are better as it will involve different surgeons and allow for comparison of outcomes)

Unstable subtrochanteric fractures with medial comminution were not excluded, especially in the DHS group.

All age groups were included in the two groups; this might have skewed the results.

There was no clear distinction between younger and older patients in terms of the aetiology of the fractures.

Overall Conclusions

IM nails are technically more demanding and the operative procedure takes longer to complete, when compared with DHS fixation. However, there may be a tendency for patients treated with an IM nail to regain better functional outcome. However, a prospective, multicentre, randomised control trial is still required to fully answer the question, 'Are IM nails or DHS' the best treatment option for extracapsular proximal femoral fractures?'