

doi:10.1016/j.injury.2009.06.231

5B.4**The AO/ASIF proximal femoral nail antirotation (PFNA): A new design for the treatment of unstable proximal femoral fractures**

P.K.R. Mereddy*, S. Kamath, M. Ramakrishnan, M.H.A. Malik, N.J. Donnachie

Wirral University Teaching Hospital, UK

Introduction: PFNA design compacts the cancellous bone to provide increased stability and has been bio-mechanically proven to retard rotation and varus collapse. We evaluated the early results of treatment of proximal femoral fractures by using PFNA.

Methods: Sixty-two patients who underwent PFNA fixation between 2006 and 2007 were reviewed. Fractures were categorised according to the AO/ASIF classification. The quality of fracture reduction, PFNA blade position and neck shaft angle were assessed. The tip–apex distance was measured (TAD). Intra-operative technical difficulties and complications were recorded.

Results: Sixty-two patients with a mean age of 78 years (range 44–94 years) were reviewed (20 men and 42 women). Most fractures (48) resulted from low energy injury following a fall. Associated injuries were noted in 15 patients. Majority of the fractures were AO/ASIF types 31A2 (26) and 31A3 (33). Closed reduction was successful in 50 patients and 12 patients required open reduction. Fracture reduction was good in 41, acceptable in 19 and poor in 2 patients. PFNA blade position was central in 52 patients. Mean pre-op neck shaft angle was 132 and post-op was 130. Twenty-four patients had TAD of less than 10 mm, 25 had 10–25 mm and 13 had >20 mm. Technical difficulties were encountered in 14 operations. Fifty-two fractures united between 3 and 4 months. Four patients had delayed union (6–8 months). Two patients were lost to follow-up. Five patients died (2—early post-op period and 3—after 3 months). PFNA blade cutout was noted in two patients. There was no infection.

Conclusions: Unstable proximal femoral fractures were treated successfully with the PFNA. The PFNA blade appears to provide additional anchoring in osteoporotic bone.

Keywords: Proximal femoral nail antirotation; New design; Unstable; Proximal femoral fractures

doi:10.1016/j.injury.2009.06.232

5B.5**An indepth analysis of why decision of conservative management of hip fractures was made in 50 patients: A pilot audit study done in Northwest of England**

A. Sahu*, M. Rashid, S. Dalal, B.D. Todd, G.A. Cook

Stepping Hill Hospital, UK

Introduction: Hip fractures guidelines suggest that all patients with fracture neck of femur should be operated upon as soon as possible (within 24 h). Despite this different studies suggest that still 11% of hip fractures are treated conservatively (varies 3–37%).

Aim: Our main aim was to find out whether there is a place for non-operative treatment as a definitive primary option in patients with significant medical co-morbidity.

Methods: We did this audit in 2007 collating information on 1010 hip fracture patients across 14 NHS hospitals in England. 50 out of 1010 (4.95%) patients were treated conservatively. We reviewed the

Results: There were 17 males and 33 females patients managed conservatively in our study. During hospitalisation, 4 became bedridden and 30 died. Amongst these 50 patients, 8 were deemed physically unfit for surgery by anaesthetists and 2 by medical consultants. The decision was made by orthopaedic consultants in 10 cases and by multidisciplinary team in 4 cases. Five patients refused surgery and five patients were palliative due to terminal illnesses. Patients who did not proceed to surgery had significantly higher mortality rates (overall mortality rate 60%) suggesting that they were physiologically much worse group of patients.

Conclusion: As the average life span of our population increases, some hip fractures are now treated non-operatively because of the possibility of severe or fatal complications due to surgery. Often, refusal of surgery by the patient or the patients' family obligates the need for non-operative treatment. It might be acceptable not to opt for the surgery if the patients are medically very high risk because of these reasons (e.g. acute cardiac event, severe aortic stenosis, multi-organ failure, etc.).

Keywords: Non-operative management; Hip fractures

doi:10.1016/j.injury.2009.06.233

5B.6**Cancellation of orthopaedic trauma cases**

R. Walton*, R. Ravi, P. Pidikiti, N. Vora

Mersey Deanery, UK

Background: Cancellation of orthopaedic trauma cases is a major problem. The effects of delay are pertinent to proximal femoral fractures, in which operative intervention beyond 48 h leads to increased mortality, morbidity and length of stay. Identification of reasons for cancellation could allow strategies to improve efficiency of care.

Aims: To establish reasons for the cancellation of orthopaedic trauma operating in patients with proximal femoral fractures and other skeletal trauma. To evaluate impact of cancellation on delay to procedure and length of stay.

Patients and methods: 1356 patients were listed for orthopaedic trauma procedures at Whiston Hospital between January and October 2006. 143 patients were excluded, most frequently due to institution of non-operative management. Data was recorded retrospectively on a standardised proforma.

Results: 100 (8.24%) cases were cancelled. 49% of cancelled cases were proximal femoral fractures, with the remainder an even split between other skeletal trauma. 41% of cancelled cases were medically unstable patients, whilst 39% were for avoidable reasons.

The sub-analysis of proximal femoral fractures revealed that 44.9% of cancelled cases were potentially avoidable. 20.4% of cancellations were patients taking anticoagulants, which had not been reversed. 8.2% were in anaemic patients who had not been transfused. Other skeletal trauma was more commonly cancelled due to a lack of operating time (39.2%).

In cancelled patients with proximal femoral fractures, mean delay to surgery was 5.05 days and mean length of stay 30.25 days. Anticoagulated patients had a mean delay of 5.1 days and mean length of stay of 23.1 days. The impact of cancellation on other skeletal trauma was less.

Conclusion: Cancellations are common in orthopaedic trauma. Many are avoidable, particularly in proximal femoral fractures, leading to operative intervention beyond 48 h of injury. Strategies including protocols for anticoagulation reversal may be helpful in reducing the burden of cancellations.

Keywords: Proximal femoral fractures; Cancellation; Length of stay

doi:10.1016/j.injury.2009.06.234

5B.7

Irreducible subtrochanteric fractures treated by open reduction and internal fixation with cables and proximal femoral nailing

P.K.R. Mereddy*, R. Shariff, B. Kapoor, M. Ramakrishnan, J.C. Kaye

Wirral University Teaching Hospital, UK

Introduction: Subtrochanteric fractures represent 10% of proximal femoral fractures. Treatment of these fractures is technically demanding and has much higher rate of complications. Theoretically, complications can be minimised by accurate reduction and internal fixation. However, there are concerns regarding effects of open reduction on fracture healing. We assessed the fracture union and complications following open reduction and internal fixation (ORIF) of irreducible subtrochanteric fractures with cables and the long proximal femoral nail (PFN).

Methods: Thirty-nine patients who underwent ORIF between 2001 and 2006 were reviewed. We determined the mechanism of injury, associated injuries, fracture pattern, quality of reduction, technical difficulties and fracture union. ASA grading and other postoperative complications were recorded.

Results: Thirty-nine patients (17 men and 22 women) with a mean age of 73 (range 21–93) were included. Associated injuries were noted in 12 (31%) patients. There were 17 subtrochanteric, 17 intertrochanteric with subtrochanteric extension, and 5 reverse oblique fractures. Open reduction was performed when closed reduction failed or when medial cortex was comminuted. Technical difficulties were encountered in eight patients. Twenty-seven fractures united between 3 and 12 months. Sixteen patients died within one year (within 3 months: 6 patients, between 3 and 12 months: 10 patients) because of complications not related to the fracture. Four patients were transferred to other hospitals for rehabilitation. All survived patients recovered expected degree of mobility. Two patients required revision (one non-union and one proximal screw migration). There was no infection.

Conclusions: Treatment of subtrochanteric fractures is technically demanding. Factors including co-morbidities, pre-injury mobility, fracture configuration and bone quality need consideration. It is important to obtain a satisfactory reduction in these fractures to facilitate early mobilisation and fracture union. Treatment of irreducible subtrochanteric fractures with the long PFN and Dall Miles cables produced satisfactory fracture union.

Keywords: Irreducible subtrochanteric fractures; Open reduction; Proximal femoral nailing; Dall Miles cables

doi:10.1016/j.injury.2009.06.235

5B.8

Periprosthetic fractures of the femur after total hip arthroplasty

G.M. Calori*, M. d'Imporzano, L. Tagliabue

Istituto Ortopedico Gaetano Pini, Italy

The fractures of the femur are considered amongst the most complicated to resolve after an operation of total hip arthroplasty (THA).

Currently, in the USA, there are approximately 200,000 THA implanted a year and this number is increasing constantly. This increase is justified by the continual evolution of the material and operating techniques available, which have enabled orthopaedic

specialists to operate increasingly older patients (with increasingly deteriorated bone quality) and also increasingly younger patients with the possibility of giving them back the quality of life they had before trauma, a condition which puts these patients at risk of high energy traumas which are able to provoke a fracture of the periprosthetic.

The surgeon's objectives must be represented by: the alignment of the fracture, early union and functional rehabilitation of the condition before injury. A pre-requisite for all this will be the certainty to be able to obtain the survival and stability of the THA implant after the treatment of the fracture.

The available options for curing can be: the conservative treatment with immobilization, or the surgical treatment of osteosynthesis and/or of the prosthetic substitution.

Nowadays the conservative treatment is reserved for inoperable patients or Vancouver Type A composed fractures.

Regarding the surgical treatment, it is unanimously agreed that internal osteosynthesis be considered useful when there is a good bone stock and a fixed prosthesis.^{1–3} The prosthesis substitution with a long-stem is indicated in cases where periprosthetic comminutions are present (in this case it is advisable to use a bone graft) and, finally, in the cases where there is a severe bone defect subsequent to a previous mobilization of the prosthesis.

However being a rare complication, it is hard to obtain homogeneous data in order to trace treatment guidelines for these types of fractures, especially because the number of patients presented in various case studies is not enough.^{4–6}

The aim is therefore to verify, on the base of the case studies available, the long-term results for surgical treatment of fractures after THA.

Keywords: Periprosthetic fractures; Total hip arthroplasty; Osteosynthesis; Long-stem

References

- 1 Johansson JE, Mc Broom R, Barrington TW, Hunter GA. Fracture of the ipsilateral femur in patients with total hip replacement. *J Bone Joint Surg* 1981;63A:1435–44.
- 2 Bethea JS, DeAndrade JR, Fleming LL, Lindenbaum SD, Welch RB. Proximal femoral fractures following total hip arthroplasty. *Clin Orthop Relat Res* 1982;(170):95–106.
- 3 Beals RK, Tower SS. Periprosthetic fractures of the femur. An analysis of 93 fractures. *Clin Orthop* 1996;327:238–46.
- 4 Adolphson P, Jonsson U, Kalen R. Fractures of the ipsilateral femur after total hip arthroplasty. *Arch Orthop Trauma Surg* 1987;106(6):353–7.
- 5 Fredin OH, Lindberg H, Carlsson AS. Femoral fracture following hip arthroplasty. *Acta Orthopaedica Scandinavica* 1987;58:20–2.
- 6 Stuchin SA. Femoral shaft fracture in porous and press-fit total hip arthroplasty. *Orthop Rev* 1990;19(2):153–9.

doi:10.1016/j.injury.2009.06.236

6A.1

6A: Polytrauma

The epidemiology of major injury in the UK

R. Alexandrescu^{a,*}, M. Woodford^a, S.J. O'Brien^a, F.E. Lecky^{a,b}

^a *University of Manchester, UK*

^b *Trauma Audit and Research Network, UK*

Although serious injury is a public health priority in the UK, there appears to be a lack of information available on population-based rates of serious injury as defined by a recognized severity of injury taxonomy.

The aim of this study is to generate epidemiological rates of major trauma in well defined populations using a large national