

Aspects on treatment of Femoral neck fractures

Studies on treatment methods, surgical approach and external validity

Sebastian Mukka

Akademisk avhandling

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Author
Sebastian Mukka

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Abstract

Femoral neck fracture (FNF) is a great challenge for today's health care and is associated with high mortality and morbidity in the elderly. In the short term several studies in the literature have demonstrated improved hip function, quality of life and fewer re-operations in elderly patients treated with total hip arthroplasty (THA) instead of internal fixation (IF). There are few reports on the long-term outcome comparing IF and THA. The vast majority of orthopaedic departments in Sweden use the direct lateral (DL) or posteriolateral (PL) approaches for THA. The PL approach has been linked to an increased risk of dislocation of the prosthesis and a higher rate of revision surgery in comparison to the DL approach. There are few reports focusing on radiological risk factors for prosthetic dislocation and patient reported hip function comparing the two surgical approaches for THA in FNF. The randomized controlled trial (RCT) is the gold standard for evaluating medical or surgical interventions. An RCT of high quality has to be internally and externally valid. Internal validity refers to a correct study design to avoid bias skewing the results. External validity (EV) refers to whether the results will be clinically relevant to a definable group of patients and can be extrapolated to the general health care situation. There are only a few reports in the orthopaedic literature focusing on the EV of published studies and none in the field of hip fractures.

Study I: This is a RCT of 100 patients with a displaced FNF comparing THA and IF. Follow-up evaluations were performed at three months and 1, 2, 4, 11 and 17 years. It was found that the Harris hip score (HHS) was higher and the rate of reoperations lower for patients treated with THA.

Study II: This is a prospective cohort study of 185 hips, comparing the DL and the PL approaches in patients treated with a hemiarthroplasty (HA) for a displaced FNF. Follow-up was after 1 year. There was no difference in patient reported outcome between the groups measured with the HHS and WOMAC index. The PL approach resulted in a higher re-operation rate while the DL approach in a higher incidence of limping.

Study III: This is a retrospective cohort study of 373 patients with a cemented bipolar HA using a PL approach for a FNF with a follow-up ranging from 6 months to 7 years. Radiographs and all surgical records were reviewed regarding femoral offset (FO), leg length discrepancy (LLD) and Wiberg angle. Patients with recurrent dislocations had a decreased postoperative FO, LLD and shallower acetabulum on the operated side compared with their controls.

Study IV: This is a prospective cohort study of 840 hips comparing patients included in a RCT with those that did not give their informed consent (NC) or did not fulfill the criteria for participating in the trial (MS). Patients in the NC and MS groups had an increased mortality rate in comparison to those included in the study. We did not find any differences in hip function between these groups.

The main conclusions of this thesis are:

- Healthy and lucid elderly patients with good hip function preoperatively, should be treated with THA for a displaced FNF.
- The DL approach is favourable in treating displaced FNF with HA due to its decreased risk of reoperation but with an identical hip function outcome as the PL approach.
- Care should be taken to restore the LLD, FO and a smaller Wiberg angle otherwise this may increase the risk of recurrent dislocation of a HA.
- Our findings suggest that trial participants had a lower mortality rate than non-participants but the functional outcome of non-participants appeared to be satisfactory. This is important to take into consideration when extrapolating study results to a health care system.

Keywords

Hip fracture, femoral neck fracture, treatment, total hip arthroplasty, hemiarthroplasty, internal fixation, surgical approach, outcome, dislocation, femoral offset, leg length discrepancy, external validity..

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