Percutaneous Cannulated Screw Versus Dynamic Hip Screw Fixation for Intracapsular Femoral Neck Fracture: A Comparative Study

Girish Swamy, MRCS*; Ali Shah, MRCS; Sami Hassan, MRCS; Abdul Aziz, MRCS; Christopher Moran, MD, FRCS; Daren Forward, MD;*
Queens Medical Centre, Nottingham University Hospitals, GREAT BRITAIN

Background/Purpose: Choice of internal fixation for undisplaced femoral neck fractures has been a controversial topic. Historically surgeons have preferred percutaneous cannulated screws over dynamic hip screw fixation. Studies have, however, shown no significant different between the two implants. Osteosynthesis with cannulated screw fixation is a less invasive technique, with less soft-tissue stripping. However, early loosening of the screws may occur if the lateral cortex is damaged from osteoporosis. In contrast, dynamic hip screw (DHS), which is a screw-plate system with fixed angles, can achieve more stable fixation in patients with osteoporosis. However, the disadvantages of DHS technique are larger skin incisions and more soft-tissue dissection. The purpose of this study was to compare the period of union, functional outcomes, and complications of patients with femoral neck fracture treated with percutaneous cannulated screws versus DHS. This study also aimed to assess the incidence of femoral neck shortening in patients with femoral neck fractures treated with multiple cannulated screws.

Methods: This was a retrospective analysis of a prospective femoral neck fracture database to include a cohort of all patients between 1999 and 2013, with undisplaced or minimally displaced intracapsular fractures treated with either percutaneous cannulated screws (n = 120) or a DHS fixation (n = 109). All patients were followed for at least 12 months. Data were reviewed for failure of the implant with radiographic evidence and the cause for revision documented. The latest AP radiograph of the fractured hip was compared with that of the contralateral uninjured hip for femoral neck shortening using the electronic images on the PACS (patient archiving and communication system).

Results: A total of 229 patients, with 109 in the percutaneous cannulated screw group and 120 in the DHS fixation group, were assessed. Both groups were similar in respect of injury mechanisms, injury-surgery interval, gender, and age (all P values = 0.29). In the cannulated hip screw fixation group there were 11 revisions surgeries compared to 4 in the DHS group ($P < 0.05$). Indications for revision included progression of osteoarthritis (n = 1), early failure of metal work (n = 1), and osteonecrosis (n = 9)(in the cannulated screw group. In the DHS group, indications for revision included osteoarthritis (n = 1) and osteonecrosis (n = 3). The shortening of femoral neck did not show significant difference in the two groups.

Conclusion: In our study, there was increased risk of osteonecrosis and failure in cannulated screw fixation group compared to the DHS fixation in the management of undisplaced femoral neck fracture. In conclusion, although DHS fixation requires a larger skin incision and more soft-tissue dissection, its use in elderly patients with osteoporosis is preferred due to its simplicity, efficacy, and high overall success rate.