

Effect of dynamic hip system blade on the treatment of femoral neck fractures in elderly patients with osteoporosis

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【Abstract】 Objective: To discuss the curative effect of the dynamic hip system blade (DHS-blade) on the treatment of femoral neck fractures in elderly patients with osteoporosis.

Methods: A retrospective study was conducted to analyse the clinical data of 60 elderly patients with osteoporosis who had been treated for femoral neck fractures with DHS-blade in our department between September 2012 and February 2014. There were 22 males and 38 females with a mean age of (66.8±3.2) years. According to the Singh Index Classification, all the patients' Singh index was below level 3. The Harris criterion and function recovery after operation were analysed.

Results: All patients were followed up for 12-17 months (mean 14 months). No femoral head necrosis, femoral neck shortening, internal fixation loosening or

backing out of the nails occurred. Bone nonunion was found in one case and he had a good recovery after total hip arthroplasty. The time for fracture healing ranged from 3-6 months (average 3.5 months). According to Harris criterion, 35 cases were rated as excellent, 22 good, 2 fair and 1 poor. The Harris scale was significantly improved from 28.46±2.35 preoperatively to 91.98±3.26 at 6 months postoperatively ($P<0.05$).

Conclusion: DHS-blade, being minimally invasive, allowing earlier postoperative exercise and avoiding the complications elicited by traditional internal fixation, is advisable for treatment of femoral neck fractured patients with osteoporosis.

Key words: *Fracture fixation; Aged; Osteoporosis; Femoral neck fractures*

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With the global aging phenomena, femoral neck fracture has become one of the most common fractures.¹ Most recently the mainstream view is that surgical treatment should be performed for the elderly who are subjected to femoral neck fracture and concurrently have osteoporosis.² In the past, arthroplasty was preferred for these patients. With the improvement of internal fixation devices, most scholars now agree that internal fixation is more suitable for such patients.³ Dynamic hip system blade (DHS-blade) is a new internal fixation device, which has been found to have many advantages such as a firm hold and fixity, good anti-rotation capability, etc.⁴ From September 2012 to February 2014, we treated a total of 60 elderly osteoporotic patients suffering

from femoral neck fracture with DHS-blade, and achieved satisfactory clinical results.

METHODS

Patients

The study consisted of 60 cases, including 22 males and 38 females. All of them were older than 60 years (mean 66.8 years±3.2 years) with Singh index of 3 or less and closed femoral neck fractures. According to Garden type classification, there were type II in 7 cases, type III in 46 cases, and type IV in 7 cases. The causes of injury were falling down in 55 cases and traffic accident in 5 cases. The time between injury and surgery was 12-72 hours (15 hours on average).

Preoperative preparation

After admission, all patients were given skin traction of the affected limbs (traction weight 3 kg). Blood pressure was kept below 160/100 mmHg, blood glucose below 8 mmol/L, and the vital signs were stable.

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Surgical procedures

After general anesthesia, the patient lay on the orthopedic traction bed, with contralateral lower limb abducted and hip flexor knees fixed. In the state of traction, the wounded limb was abducted and externally rotated, then internally rotated and fixed. The patients were detected by C-arm fluoroscopy to confirm a sound apposition and alignment of the fractured ends, maintaining about 130 degrees of the neck-shaft angle and 15 degrees of anteversion. A 5 cm skin incision was made beneath the lateral femoral trochanter to expose the greater trochanter. After placing a locator about 2 cm beneath the bottom of the greater trochanter to guide the needle along the direction of the femoral neck, a guide pin was pushed and its location adjusted at the femoral calcar under the anteroposterior film of C-arm fluoroscope, and the lateral film was located at the central axis of the femoral neck. After a desired length of DHS-blade was determined, we reamed the bone along the direction of guide pin, then tapped the blade to make the blade tip about 5-10 mm beneath the surface of femoral cartilage. The side plates were placed to make them close to the bone

surface, followed by 2 or 3 locking screws. Finally the screw caps and the blade were fastened; the wound was washed out and sutured.

Postoperative treatments

Antibiotics were used within one day after surgery to prevent infection. The second day after surgery, the patients began functional exercise of the ipsilateral hip, knee and ankle joints. After one week, the patients could gradually get out of bed with nonweight-bearing. Three months later, the affected limb allowed weight-bearing gradually according to the results of the X-rays.

Statistical analysis

The data were statistically analyzed by SPSS 13.0, and group comparison was conducted by paired Student's *t* test. Data were expressed as mean±standard deviation, $\alpha=0.05$.

RESULTS

A typical case is shown in Figure 1.

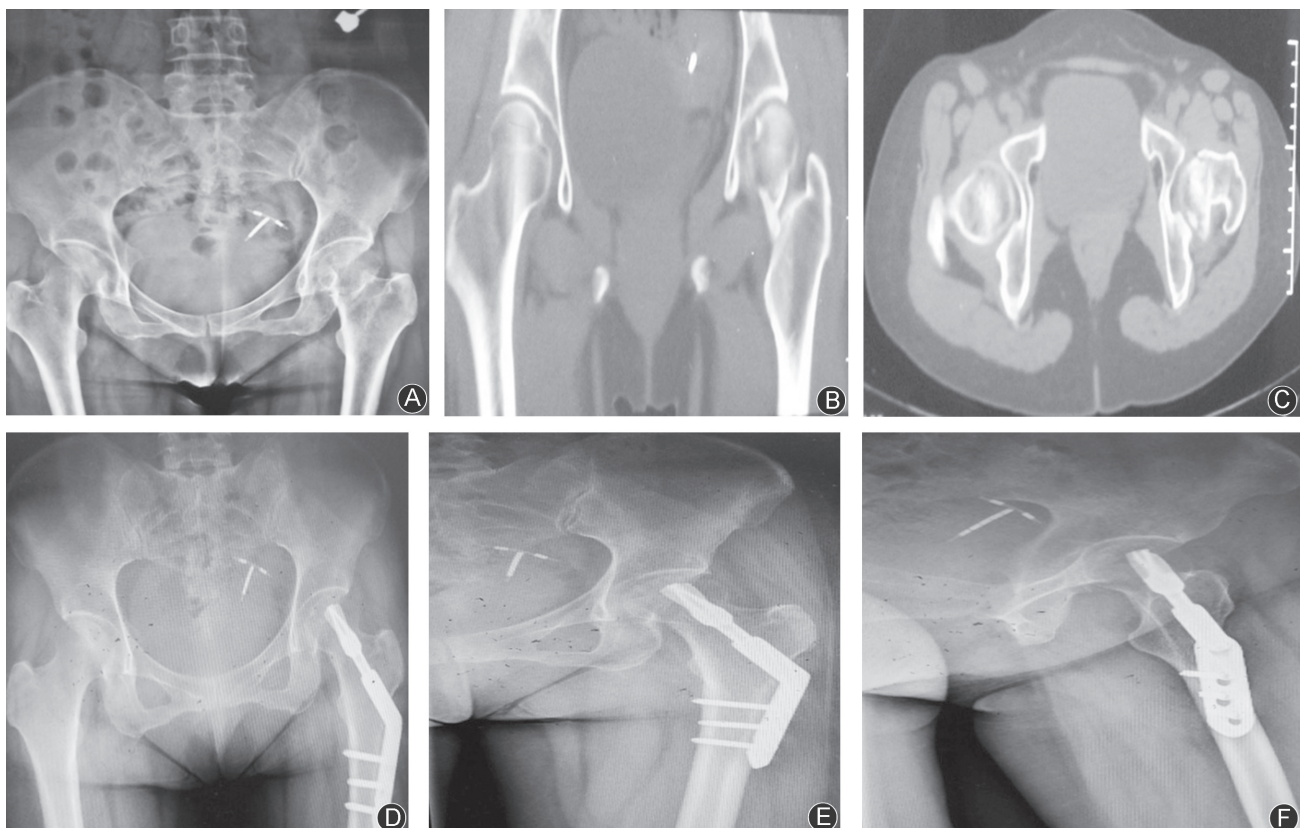


Figure 1. A 69-year-old female patient with left femoral neck fracture (Garden III, Singh index: level 2). Preoperative imaging films (A, B, C); Postoperative 1 year films (D, E, F).

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