

Relationship between Early Postoperative Activities of Daily Living and Bony Contact of the Anteromedial Bone Cortex Following Femoral Trochanteric Fracture

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Abstract

Background: The expansion of the older population has resulted in an increase in the number of patients sustaining proximal femoral fractures. Further, femoral trochanteric fractures are classified into three different patterns based on AP (anteroposterior) view and lateral view from plain film radiographs. The best reduction position is believed to be the positive pattern, in which plain lateral view radiographs show that the medial cortex of the proximal fragment of the fractured bone is outside the medullary cavity. However, even among those with a positive pattern, we have experienced cases with a large extent of sliding, as well as those with low activities of daily living (ADL) scores during the early postoperative period. This study aimed to clarify the position of contact between the medial cortices of the proximal and distal fragments of the fractured bone and to elucidate its relationship with postoperative ADL involving weight-bearing activities.

Methods: We investigated 44 patients with femoral trochanteric fractures, who were treated with open osteosynthesis using short femoral nails in our hospital between February 2021 and December 2021. Computed tomography (CT) values, as well as the thickness and location of the bony contact at the fracture site, were measured on CT images taken at postoperative day 1; ADL scores for weight-bearing activities were measured at postoperative day 1, postoperative week 1, and postoperative week 3. Data on postoperative ADL scores for weight-bearing activities as well as the location of bony contact were statistically processed and evaluated.

Results: The ADL scores for weight-bearing activities during the first postoperative week showed a positive correlation with scores at postoperative week 3 ($r=0.69$, $p<0.05$) and a negative correlation with the location of the bony contact at postoperative day 1 ($r=-0.43$, $p<0.05$). There were 31 patients whose ADL scores for weight-bearing activities increased from postoperative day 1 to postoperative week 1 (G-group) and 13 whose scores showed no increase (P-group). The score at 3 weeks after surgery ($p<0.05$) were significantly higher in the G-group than in the P-group and location of the bony contact ($p<0.05$) were significantly lower in the G-group than in the P-group.

Conclusions: The most important finding of this study was that the further to the medial side the bony contact was located, the greater the postoperative ADL scores. Thus, during an open reduction, setting up a medially-located bony contact for the proximal fragment of the fractured bone may be associated with better ADL scores in the early postoperative period.

Key words: anteromedial bone cortex, postoperative activities of daily living, reduction, trochanteric fractures