

National Trends of Surgical Treatment for Intertrochanteric Fractures in Korea

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Intramedullary nailing has been reported to have better outcome compared with traditional plate fixation in surgical treatment of intertrochanteric fractures. We evaluated the trends of surgical treatment of intertrochanteric fracture in Korea. Data of patients with intertrochanteric fractures, who were operated between the years of 2006 and 2011, was obtained from the Health Insurance Review and Assessment Service. The ratio of intramedullary nailing increased from 27.9% in 2006 to 64.3% in 2011 ($P < 0.001$), while the ratio of plate fixation decreased. During recent 5 yr, the utilization of intramedullary nailing doubled in clinical practice of intertrochanteric fractures in Korea.

Key Words: Trends; Hip Fractures; Surgical Procedures, Operative; Fracture Fixation, Internal; Claim Registry

Surgical treatment of intertrochanteric fractures is challenging in senile patients, because of medical comorbidities and severe osteoporosis (1-3). Traditionally, these fractures were operated with a sliding hip screw with a side plate. In the early 1990s, a new method of an intramedullary nail in the proximal femur with an interlocking screw in the femoral head was introduced (4, 5). Although some controversies still remain, intramedullary nailing has been reported to have better outcomes compared with traditional plate fixation (5-7). In the United States, the rate of intramedullary fixation increased dramatically since the late 1990s (4). However, this trend was not confirmed outside the United States. The purpose of this study was to evaluate whether national trends in surgical treatment of intertrochanteric fractures had changed in Korea during recent 5 yr (2006 to 2011) using nationwide data from the Health Insurance Review and Assessment Service (HIRA).

We analyzed the HIRA nationwide database, which includes diagnoses (in International Classification of Diseases, 10th revision [ICD-10]), procedures, and the used devices for almost all Korean citizens. All new visits or admissions to hospitals in Korea for intertrochanteric fractures were recorded prospectively in a nationwide cohort by the using ICD-10 codes and procedures. To identify surgical treatment for intertrochanteric frac-

tures in patients ≥ 50 -yr-of-age, selected ICD-10 codes (S72.1), age cut-off of 50 yr, and 2 procedures (open reduction of fractured extremity-femur and closed reduction of fractured extremity-pelvis/femur) were used (8-10). The nail-fixation group and plate-fixation group were categorized according to the code of the device that was used. These data were retrospectively evaluated to determine the trends of surgical procedure of intertrochanteric fractures between the years of 2006 and 2011. Only deidentified information was used in this study, because the HIRA limited data for the public. The study protocol was approved by the HIRA institutional review boards. The patients were divided into groups according to their age (50-64, 65-79, and ≥ 80 yr) and gender. The surgical trends of intertrochanteric fractures were determined in each group. Chi-square test of independence was used to evaluate whether the proportion of each procedure (intramedullary nail and plate) changed from 2006 to 2011. Statistical analyses were conducted using SPSS for Windows version 15.0 (SPSS, Chicago, IL, USA) and statistical significance was accepted for P values < 0.05 .

From 2006 to 2011, 35,569 intertrochanteric fractures were internally fixed using an intramedullary nail or plate. Of these, the proportion of the nailing increased from 27.9% in 2006 to 64.3% in 2011 ($P < 0.001$) (Fig. 1). Even after stratification by age

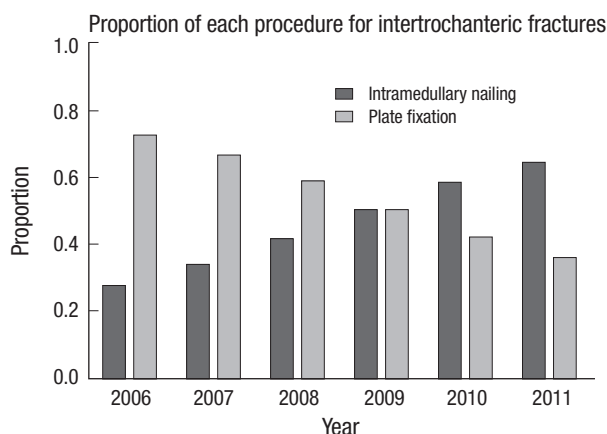


Fig. 1. Proportion of each procedure for intertrochanteric fractures.

and gender, the proportion of the nailing increased in all groups, and that of plate fixation showed a corresponding decrease in all groups.

The choice of surgical options for intertrochanteric fractures is controversial. We determined trends in the relative proportion of intramedullary nailing and plate fixation for these fractures in Korea, from 2006 to 2011. The present data reveal a shift in surgical treatment during the study period. The intramedullary nailing increased from 27.9% to 64.3% and the plate fixation showed a corresponding decrease. This finding concurs with the results of a recent surgeon-derived survey conducted in the United States (4), which showed a nationwide transition from plate fixation to intramedullary nailing in surgical treatment for intertrochanteric fracture. According to their survey, the younger surgeons have used the more intramedullary nail in the United States (4).

There are several possible reasons for increasing utilization of intramedullary nailing in Korea. First, surgeons might prefer the theoretical advantages of the nailing, such as less invasive incision and better biomechanics for fixation of proximal femur, especially in unstable intertrochanteric fracture (5-7). Second, promotion of industrial company might move from extramedullary plating to intramedullary nailing during the study periods, because the cost of nail device is higher than that of plate system in Korea. Although we could not evaluate the utilization of each device at surgeon-level in this study, younger surgeons might prefer the newer device, intramedullary nail, like as the United States (4).

Our study had some limitations. First, other important factors for decision-making, such as radiographic findings (the defect of posteromedial cortex, reverse obliquity, extension to subtro-

chanteric area, and presence of osteoporosis) and demographic characteristics (preinjury ambulatory state and instability risk), were not evaluated. Second, we could not evaluate the clinical outcomes such as complications after each fixation, because only deidentified information was available in this study.

In spite of these limitations, this is the first epidemiological study on the national trends of internal fixation for intertrochanteric fracture in East Asia, and our study demonstrated a shift in treatment of intertrochanteric fracture from plate fixation to intramedullary nailing from 2006 to 2011. Our study could provide contemporary nationwide data to estimate the surgical trend of intertrochanteric fractures.

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