**Examination of Surgical Treatment for Vancouver Classification Pseudo AL and B2 Periprosthetic Femoral Fractures Using Finite Element Method**

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**Purpose**: This study aims to investigate the treatment of Vancouver B2 fractures using finite element analysis (FEA) as a treatment method.

**Methods**: Three-dimensional CAD (computer-aided design) models were created using CT data before and after THA (total hip arthroplasty), after fracture, and after plate fixation using FEA. Four models were created, with different materials for polyethylene (PE) and titanium (Ti), and 4 models with different fixation positions and materials were created. Instability was defined as the amount of bone head displacement, and the change in stress values and displacement was compared.

**Results**: The results showed that stress was concentrated at the lower end of the stem after insertion, but after the fracture, stress concentration decreased at the lower end of the stem and increased at the upper end of the fracture site, leading to an increase in bone head displacement. The instability caused by the PE cable did not change, and plate fixation provided the same stability as after stem insertion. The number and fixation position of the PE cable did not change stress values, and instability did not change. On the other hand, a single Ti cable reduced stress at the fracture end and increased stability, but doubling the cables did not increase the reinforcement effect, and winding 2 cables under the lesser trochanter increased the stress at the lower end.

**Conclusion**: This study investigated the changes in stability and stress distribution after fracture fixation using FEA in the treatment of cementless stem perioperative fractures. The results indicated that cable fixation alone is insufficient and that combined use with plates is necessary. Additionally, the study showed that stress, which is concentrated again at the stem tip after fracture fixation, is distributed throughout the entire plate.