

## Can plate osteosynthesis of periprosthetic femoral fractures cause cement mantle failure around a stable hip stem? A biomechanical analysis

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Periprosthetic femoral fractures (PFF) are a serious complication after total hip arthroplasty. Plate fixation with screws perforating the cement mantle is a common treatment option. The study objective was to investigate hip stem stability and cement mantle integrity under dynamic loading. A cemented hip stem was implanted in 17 composite femur models. Nine bone models were osteotomised just distal to the stem and fixed with a polyaxial locking plate the other eight constructs served as the control group. All specimens were tested in a bi-axial material testing machine (100000 cycles). There were no statistically significant differences in axial nor in medial (varus) stem migration. No cement cracks were detected in both groups. Plate fixation of a PFF with a stable, cemented prosthesis did not lead to cement mantle failure in this in vitro study.

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