

High Failure Rates of Locking Compression Plate Osteosynthesis With Transverse Fracture Around a Well-Fixed Stem Tip for Periprosthetic Femoral Fracture

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Purpose: This study investigated the incidence of failure after locking compression plate (LCP) osteosynthesis around a well-fixed stem of periprosthetic femoral fractures (PFFs).

Methods: We retrospectively evaluated the outcomes of a series of 63 Vancouver type B1 and C PFFs treated with LCP between May 2001 and February 2018. The mean duration of follow-up was 47 months. Only patients who had fracture fixation with a locking plate without supplemental allograft struts were included in the study. We identified 6 periprosthetic fractures of proximal Vancouver B1 fractures with spiral pattern (Group A). Vancouver B1 fractures around the tip of the stem were grouped into 7 transverse fracture pattern (Group B) and 38 other fracture patterns such as comminuted, oblique, or spiral (Group C). Vancouver C fractures consisted of 12 periprosthetic fractures with spiral, comminuted, or oblique pattern (Group D).

Results: Fracture healing without complications was achieved in all (100%) 6 cases in Group A, 4 of 7 (57%) cases in Group B, 35 of 38 (92%) cases in Group C, and in 11 of 12 (92%) cases in Group D. There were 3 cases of metal failure with nonunion in the Group B; 1 patient had stem subsidence with fracture healing and another had metal failure with nonunion due to inappropriate fixation in Groups C and D, respectively. The failure rates of transverse Vancouver type B1 PFFs around the stem tip were significantly different than those of Vancouver type B1/C PFFs with other patterns.

Conclusion: LCP osteosynthesis satisfactorily treats Vancouver type B1 and C PFFs. However, for transverse Vancouver type B1 PFFs around the stem tip, additional fixation is necessary because LCP osteosynthesis has high failure rates.