The Modified Hardinge Approach Is Not Inferior to Trochanteric Flip Osteotomy for Pipkin Type IV Femoral Head Fractures: A Comparative Study in 40 Patients

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Purpose: To date, no study has compared the different surgical approaches for Pipkin type IV femoral head fractures. This study was therefore conducted to compare the modified Hardinge approach and trochanteric flip osteotomy for the treatment of Pipkin type IV femoral head fractures.

Methods: This retrospective study included 40 patients who underwent surgical treatment for Pipkin type IV femoral head fractures between 2011 and 2020 at a Level I trauma center. All patients completed at least 1 year of follow-up. The clinical outcome of the Merle d'Aubigné-Postel score and radiological outcomes, including the quality of the fracture reduction, osteonecrosis of the femoral head, posttraumatic osteoarthritis, and heterotopic ossification, were compared between the 2 groups. Conversion to total hip replacement was recorded as the main outcome measure, analyzed by Kaplan-Meier curve and log-rank test.

Results: 19 and 21 patients were treated using the modified Hardinge approach (Group A) and trochanteric flip osteotomy (Group B), respectively. The estimated surgical blood loss in Group B (500.00 ± 315.44 mL) was significantly higher than in Group A (246.32 ± 141.35 mL; P = 0.002). Two patients in Group B complained of discomfort caused by the trochanteric screws and requested implant removal. Radiographic outcomes, including the quality of fracture reduction, osteonecrosis of the femoral head, posttraumatic osteoarthritis, and heterotopic ossification did not differ significantly between the 2 groups. The clinical outcomes assessed using the Merle d'Aubigné-Postel score 1 year after injury were nearly identical between the 2 groups (P = 0.836). Four patients (21.1%) in Group A and 3 patients (14.3%) in Group B underwent conversion to total hip replacement during the follow-up period; the log-rank test showed no significant difference (P = 0.796).

Conclusion: The modified Hardinge approach resulted in reduced blood loss, with clinical and radiological outcomes similar to those of trochanteric osteotomy. The modified Hardinge approach is thus an acceptable alternative to trochanteric flip osteotomy.