

Is It Necessary to Fix the Displaced Quadrilateral Plate Directly in Acetabular Fracture?

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Purpose: Acetabular fractures with quadrilateral plate involvement have always been notoriously difficult fractures to treat. There is no consensus concerning whether or not direct reduction and internal fixation of a quadrilateral plate is preferred for a displaced quadrilateral plate in acetabular fracture. The purpose of this study is to confirm the effect of direct fixation for a displaced quadrilateral plate in acetabular fracture.

Methods: From January 2000 to May 2018, 58 consecutive patients underwent surgery for open reduction and internal fixation in acetabular fractures with a severely displaced quadrilateral plate. 48 patients were operated in our center between 2010 and 2013 with indirect reduction and fixation using suprapectineal plate only (Indirect group), and 10 patients between 2014 and 2018 underwent direct reduction and internal fixation of a displaced quadrilateral plate using an infrapectineal plate or contoured spring plate (Direct group). The primary outcomes are survivorship of hip joint as posttraumatic osteoarthritis using the Matta scoring system between 2 groups. The other assessments were evaluated general demographics, postoperative Matta radiological outcome grading, medialization of the femoral head, and other complications.

Results: In a comparison of primary outcome between the 2 groups, 15 patients out of 48 in the Indirect group (31.2%) and 1 patient of 10 in the Direct group (10%) developed posttraumatic osteoarthritis as fair and poor by Matta scoring system; the difference between the 2 groups is statistically significant ($P < 0.001$). Six patients in the Indirect group and 1 patient in the Direct group were converted to total hip arthroplasty due to posttraumatic osteoarthritis. In the assessment of postoperative Matta radiological outcome grading, all 10 patients in the Direct group had achieved anatomical and congruent reduction status compared with 8 with poor reduction status in the Indirect group ($P < 0.001$). The mean of medialization of the femoral head is 0.5 mm in the Direct group compared with 4 mm in the Indirect group ($P < 0.001$).

Conclusion: Compared to reduce indirectly and fix with the suprapectineal plate for the displaced quadrilateral plate in acetabular fractures, the treatment using a direct reduction and internal fixation with buttress plate improved reduction quality of articular displacement and offered better survivorship of the affected hip joint.