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## ***Managing Acetabular Fractures with Quadrilateral Plate Involvement***

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There have been limited studies in the current literature about fixation techniques used in the management of acetabular fractures with quadrilateral plate involvement (1-4). Suprapectineal plating versus subpectineal plating constitutes one main point of the discussion. Technical modifications such as the addition of periarticular lag screws over a suprapectineal plate, and the use of vertical or horizontal infrapectineal plates, are other matters of interest.

This biomechanical study by May et al. compared the performances of four different fixation constructs in acetabular fractures with quadrilateral plate (QLP) disruption—Group 1: A suprapectineal 12-hole reconstruction plate bridging the QLP; Group 2: Same instrumentation as in Group 1, but with additional periarticular screws along the QLP; Group 3: Same instrumentation as in Group 1, but with an additional 6-hole buttress plate below the pelvic brim; Group 4: Combination of the instrumentation used in Groups 2 and 3.

During simulation of inadvertent supraphysiologic load, the median load to failure was higher in Groups 2 and 4 compared with Groups 1 and 3. May et al. concluded that additional periarticular screws along the QLP increased the fixation strength and that periarticular screws were superior to infrapectineal buttress plates in preventing medial redisplacement of the QLP. However, unlike in our usual practice, the infrapectineal plate used in this study was not applied from the sciatic buttress to the inner side of the

upper pubic arm, and this may be a technical weakness of the study.

Tanoglu et al. reported another biomechanical study that compared three different fixation techniques—Group 1: Posterior column lag screws over a suprapectineal plate; Group 2: Posterior column lag screws over a suprapectineal plate and an infrapectineal plate; Group 3: A suprapectineal plate and a vertical infrapectineal plate—for anterior column posterior hemitransverse acetabular fractures (2). In the dynamic and static tests, Group 3 showed less stable fixation compared to Group 2. In the static tests, there was no statistically significant difference between Groups 1 and 2, although less displacement was obtained in Group 2. These authors concluded there was better stability and less fracture displacement with the combination of posterior lag screws over a suprapectineal plate and an infrapectineal plate supporting the pelvic brim along both sides of the linea terminalis than with a suprapectineal plate accompanying a vertical infrapectineal plate (2). As is our usual practice, these authors applied the infrapectineal plate along the inferior side of the pelvic brim from the sciatic buttress to the inner side of the upper pubic arm. Even though they found no statistically significant differences in stiffness values among the 3 groups, adding posterior column lag screws over a suprapectineal plate and adding infrapectineal plate fixation to this construct can result in less displacement.

In our experience, additional infrapectineal plate fixation facilitates reduction of acetabular fractures that have QLP disruptions with its buttress effect. This buttress effect probably varies according to plate position (vertical or horizontal) and also fixation type. In what Tanoglu et al. called the “brim sandwich technique,” suprapectineal and infrapectineal plates provide a stable construct superiorly and inferiorly along the pelvic brim. In our cases of acetabular fractures using the modified Stoppa approach, if infrapectineal plate fixation is used, we apply the plate from the sciatic buttress to the inner side of the upper pubic arm, instead of a 6-hole buttress plate applied below the pelvic brim, which has no fixation to the inner side of the upper pubic arm.

In this study by May et al., if the infrapectineal plate had been applied from the sciatic buttress to the inner side of the upper pubic arm, we believe the results would have been different and that the conclusion that an “additional infrapectineal buttress plate did not have any impact on the fixation’s capability to counteract medial redisplacement of the QLP” would also have been different.

## References

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