New Techniques and Emerging Evidence #NT16

Knee and Tibial Plateau

Intraosseous Shelf Plate Fixation for Depressed Articular Fragments in Tibial Plateau Fractures: A Technical Trick and Case Series

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Purpose: Tibial plateau fractures with uncontained, peripheral, metaphyseal defects and displaced articular injuries can be challenging to stabilize using traditional methods. The purpose of this study was to describe a technique to support the plateau articular surface in these cases, and report on outcomes of a small series. This technique uses a small or mini fragment plate, contoured to function as an intraosseous shelf plate.

Methods: A retrospective review of tibial plateau fractures treated with the shelf plate technique at 5 trauma centers was performed. Patient demographic, injury, surgical factors, and outcomes (including difference between postoperative plateau slope and final slope, loss of reduction, and other complications) were recorded.

Results: 20 patients underwent operative fixation of a tibial plateau fracture using the shelf plate technique. Mean age was 45 years and mean follow-up was 33 weeks. There were no cases of loss of reduction, shelf plate breakage, or clinically relevant change in reduction. All fractures united uneventfully. The most common complication noted was postoperative stiffness.

Conclusion: The intraosseous shelf plate is a viable option for providing fixed-angle support to the articular surface in tibial plateau fractures. It is particularly useful in patterns with uncontained articular depression and a large metaphyseal void.

Figure 1. This patient sustained a hyper-extension plateau fracture with reversal of posterior slope and anterior metaphyseal compression failure, primarily affecting the medial condyle. Distal to proximal wires were used to create a posterior hinge, and a distractor was used to restore the native slope. Following reduction, the shelf plate was inserted to directly support the reduced articular block (central). In this case, the lateral articular surface also required reduction and stabilization (right).