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Arthroscopic Management of Tibial Plateau Fractures

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INTRODUCTION

Tibial plateau fractures typically present as a high-mechanism injury in a young patient, such as a car vs pedestrian or fall from height, or a low-energy fracture in elderly patients. Among athletes, they are common in skiers.^{1,2}

The mechanism of injury is a combination of a varus or valgus deforming force and axial load resulting in a spectrum of shear and depression fracture patterns. The most common classification is the Schatzker system (Figure 4-1).

Several features of tibial plateau bony anatomy are critical for understanding and treating these injuries.¹

- ▶ The lateral tibial plateau is convex and lies 2 to 3 mm proximal to the medial plateau. Raising depressed fragments of the lateral tibial plateau only to the level of the medial plateau will not result in anatomic restoration of the articular surface.
- ▶ Normally, the lateral condyle of the femur lies directly in line with the lateral rim of the tibial plateau and the medial condyle with the medial rim of the tibial plateau. Widening of the tibial plateau is a common feature of tibial plateau fractures, and failure to reduce the condylar width results in abnormal articular contact with the femoral condyles.
- ▶ On average, the proximal tibia has a posterior slope of 9 degrees. This observation is critical in obtaining proper fluoroscopic imaging during fixation to evaluate articular reduction.

Associated soft tissue injury with tibial plateau fracture is common. Frequency of lateral meniscal injury is frequently quoted as present in 42% to 45% of plateau fractures^{3,4}; however, in one series, 91% of patients had evidence of lateral meniscal pathology and 77% had tear or avulsion of a cruciate or collateral ligament.⁵ The menisci function as significant secondary stabilizers of the knee joint, and their treatment is related to outcomes. The clinical implications of associated cruciate and collateral ligament injury remain incompletely defined.

Arthroscopy has emerged as a useful tool for evaluating articular reduction and treating associated soft tissue pathology. Short-term results of arthroscopic reduction internal fixation