

Chapter 81

Tibial Plateau Fractures

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Description

Schatzker Classification

Schatzker classification (Fig. 81.1), which was introduced in 1979, is the most commonly used classification for tibial plateau fractures [1].

I Split fracture of the lateral tibial plateau without articular depression

II Split and depressed fracture of the lateral tibial plateau

III Isolated depression of the lateral plateau

IV Fracture of the medial plateau

V Bicondylar plateau fracture with varying degrees of articular depression and displacement of the condyles

VI Bicondylar tibial plateau fracture with diaphyseal metaphyseal dissociation

THREE COLUMN Classification

Recently an new concept of classifying tibial plateau fractures has been introduced, based on CT findings. It aims to address the need of classifying the injury according to the number and location of different areas of the proximal tibia that needs reduction and fixation (Fig. 81.2) [2].

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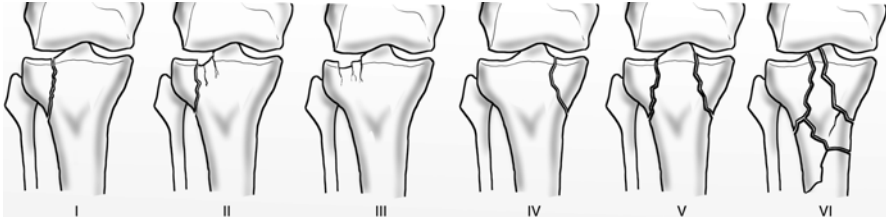


Fig. 81.1 The six types of the Schatzker classification system: type I split fracture of the lateral plateau without any depression; type II split depression of the lateral plateau; type III isolated depression of the lateral plateau; type IV fracture of the medial plateau; type V bicondylar plateau fracture; type VI bicondylar plateau fracture with diaphyseal - metaphyseal dissociation

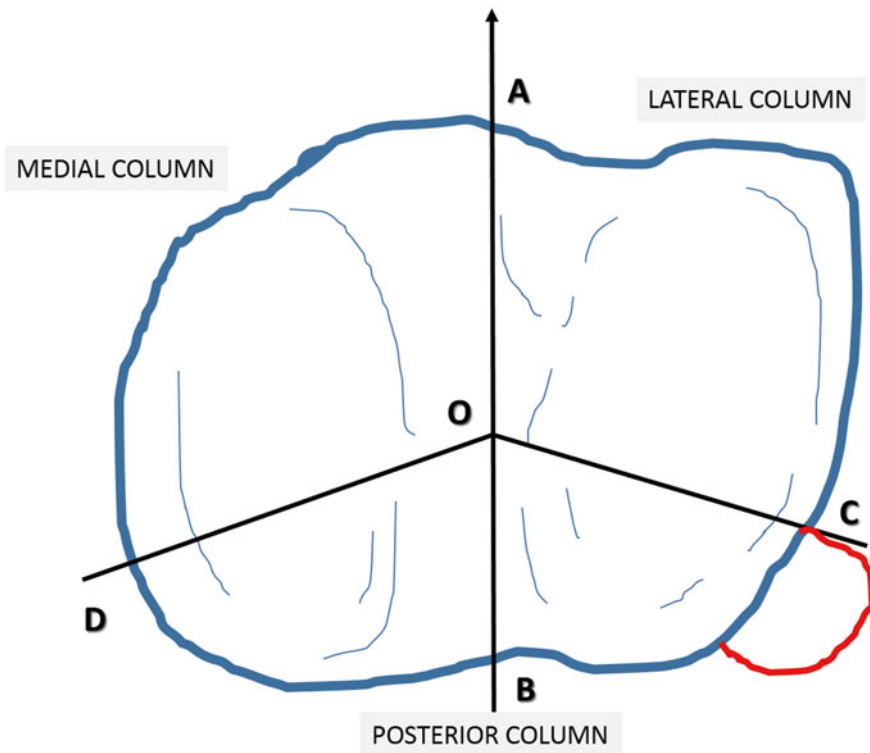


Fig. 81.2 Graphic representation of the three column classification scheme based on findings of the axial cuts of CT imaging. The tibial plateau is divided in 3 areas, (lateral column, medial column, posterior column). The point *O* is the midpoint of the two tibial spines. The point *A* represents the anterior tibial tuberosity. The point *D* is the posteromedial ridge of proximal tibia. The point *C* is the most anterior point of the fibular head. The point *B* is the posterior sulcus of the tibial plateau, which intersects the posterior column into medial and lateral parts

- Zero Column fracture-pure depression
- One Column fracture
 - lateral (split \pm depression)
 - medial (split \pm depression)
 - posterior (split \pm depression)
- Two Column fracture
 - anterolateral and posterolateral
 - anterolateral and posteromedial
 - anteromedial and posteromedial
- Three Column fracture

Treatment Strategy

Tibial plateau fracture treatment aims to reestablish joint stability, alignment, and articular congruity while preserving full range of motion. If the above prerequisites are met, painless knee function could be achieved and posttraumatic arthritis may be prevented. As being intra-articular, tibial plateau fractures are usually subjected to surgical treatment for optimal results. Nonetheless, undisplaced fractures with minimal impaction (less than 3–5 mm) from type 1 to 4 can be treated by non-operative methods. The same stands for fractures in elderly, low-demand, or osteoporotic patients. Methods of non-operative treatment for tibial plateau fracture include plaster cast immobilization, skeletal traction and functional cast bracing. Types 5 and 6 shall be treated operatively, even if non-displaced, since the amount of comminution may jeopardize the alignment and healing of the fracture. Current internal fixation techniques include ligamentotaxis, percutaneous fixation, buttress and locking plating techniques [3]. When extensive comminution and damaged soft tissues prohibit the use of internal fixation, circular external fixators are an excellent fallback option for management [4–7].

Type I Displaced fractures are surgically stabilized with lag screws alone or with a plate and screws.

Type II Displaced fractures are surgically stabilized with screws alone or with a plate and screws after elevation of the depressed bone fragment and potential use of graft to fill the void [8].

Type III Depressed fractures are surgically stabilized with screws or with a plate after elevation of the depressed bone fragment and potential use of graft to fill the void [8].

Type IV Displaced fractures are surgically stabilized with screws alone or with plate and screws.

Type V & VI Displaced fractures are surgically stabilized with lag screws and one or two plates if the skin condition is normal. The dual buttress technique or lateral locking plates (alone or with the combined use of a medial buttress plate) provide the commonest plating options. If the soft tissue and the skin are lacerated, contused or bruised an external fixator frame provides an alternative minimal invasive option. Several combinations (e.g. lag screws or plates with frames) can be used based on the personality of the fracture and the surgeon's skills and preferences. Lately even the combined used of condylar bolts and intramedullary nailing has been proposed for the treatment of such types with minimal articular impaction [3, 9, 10].

As far as the new classification scheme [2] there are no large series besides the original publication that validate its' suggestions with clinical results.

No high level of evidence is available with regards to the treatment modalities.

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