Operative Treatment of Fractures of the Tibial Plafond


In this review, we examine a study published in The Journal of Bone and Joint Surgery in 1996 titled “Operative Treatment of Fractures of the Tibial Plafond.”

This randomized, prospective study investigated 2 methods of operative treatment for intra-articular fractures of the tibial plafond. Approximately 26% of the fractures were open.

Indications for surgery included an open fracture and unacceptable alignment of the fracture or malreduction, or both, of the tibia or the fibula. A closed reduction was attempted for every fracture.

Exclusion criteria included: an acceptable reduction of the fracture; severe osteoporosis; an inability to walk; and a neuropathic joint.

Group I patients underwent open reduction and internal fixation (ORIF) of both the tibial plafond fracture and fibula fracture through 2 separate incisions. Group II patients were managed with external fixation with or without limited internal fixation (fibular plating or tibial interfragmentary screws).

Care of the pin site began immediately postoperatively and consisted of cleaning with hydrogen peroxide 3 times per day. Patients were advised to maintain toe-touch weight bearing for 10 to 12 weeks.

The external fixator was kept in place for an average of 10 weeks (range, 6-14 weeks) and was removed after radiographs revealed evidence of healing callus.

Of the 18 patients receiving open reduction and internal fixation, 7 patients had 15 operative complications. A major infection complication was defined as an infection that necessitated operative treatment, breakdown of the wound that necessitated a soft tissue coverage procedure, a neurovascular injury, failure of fixation, malunion, nonunion, or amputation.

Of the 20 patients receiving external fixation, 4 complications in 4 patients occurred. Of the 19 complications in the 2 groups, 13 occurred within 4 months after the injury, and all involved a soft tissue infection or a wound breakdown. The complications after open reduction and internal fixation were severe, and amputation was necessary in 3 patients.

In Group I, 8 fractures had an anatomical reduction, and all of the patients had an anatomical reduction or healing with <5° of angular malalignment.

In Group II, 4 type-I fractures had an anatomical reduction.

The fractures in Group I healed at an average of 14 weeks (range, 10-40 weeks) postoperatively. The fractures in Group II healed at an average of 15 weeks (range, 8-40 weeks) postoperatively.

Patients returned for follow-up at least every 3 months for the first year and every 6 months thereafter. At a minimum follow-up of 2 years (average, 39 months; range, 25-51 months), no significant difference between the average clinical scores or osteoarthritic changes were noted.

The authors of this study concluded that external fixation with or without limited internal fixation is satisfactory for treatment of tibial plafond fractures.
There have been many advances in orthopedic trauma over the past 2 decades, including an increase in minimally invasive techniques, the use of navigated systems, and materials such as Infuse and bone graft substitute for assistance with bone healing. Better quality plates, contoured plates, and locked plates have also been developed over this time span. Despite the multitude of advances, there have not been many advances in the treatment of tibial plafond fractures.

Since publication of this article, several studies that addressed the optimal treatment of tibial plafond fractures were reviewed. The majority of these papers recommend the use of a 2-stage technique for the treatment of tibial plafond fractures, especially those with significant soft tissue compromise. The 2-stage technique involves the use of external fixation initially to stabilize the fracture and allow the soft tissues to heal. Definitive surgery with internal fixation is delayed for several days to several weeks, allowing edema and soft tissue damage to improve. A study by Blauth et al in 2001 examined 3 techniques for tibial plafond fractures (open reduction internal fixation [ORIF], external fixation, and 2-stage) and found that a 2-stage technique is the best option for achieving satisfactory results while decreasing complications.

The emphasis on the soft tissues is paramount when treating tibial plafond fractures. Initial stabilization with external fixation to allow soft tissue healing and decrease the swelling prior to definitive fixation with ORIF is currently the gold standard. However, as demonstrated by Harris et al, patients with extensive soft tissue compromise and severe comminution can be treated safely with external fixation and limited internal fixation. Another study by Wang et al reported that closed tibial pilon fractures treated with a 2-stage technique and external fixation with limited internal fixation had similar results. It seems that the treatment of tibial pilon fractures with ORIF initially alone is not desirable and has been largely replaced by a 2-stage technique with external fixation and later ORIF when soft tissues have sufficiently healed.

REFERENCES

doi: 10.3928/01477447-20110714-17