MANAGEMENT OF PROXIMAL TIBIA FRACTURES WITH LESS INVASIVE PROCEDURES

**ABSTRACT**

Low and High energy Tibial plateau fractures present a spectrum of soft tissues and bony injuries that can produce permanent disabilities. Their treatment is challenged by fracture comminution, instability, displacement and extensive soft tissues injuries. Multiple options are available for treating Proximal Tibial fractures. Functional outcome of Tibial Condylar fractures treated with locking plate and importance of satisfactory reduction and post operative protocols in obtaining good results need to be evaluated.

**KEYWORDS:**

Introduction :-
Proximal Tibia fractures include articular depression, condyler displacement metaphyseal fracture extension associated injuries include cruciate & collateral ligament injuries and meniscal tears. Latest implants and techniques have provided better options for treatment of Proximal Tibial fractures. These include technique of minimal incision and reduction for articular surface restoration and using locking compression plate. Locking plates may decrease the need for dual plating in certain be condyler fracture patterns. Data regarding the use of these plates, their functional outcome in Indian population is scarce which necessitates this study.

Material & Methods: -
Around 26 Cases of Tibial Condylar fracture during the last two years included in this study. Criteria for inclusion were adult patients with comminuted metaphyseal fractures of proximal Tibia treated with lateraly placed fixed angle plate. Patients above age of 18 years. Exclusion criteria, all diaphyseal fractures, patients less than 18 years of age, patients who are medically unfit for surgery. Patients were temporarily immobilized with Posterior slab and surgery was done after subsidence of swelling.

Less Invasive Stabilization System plates and screws were used in all patients. The titanium plate is attached to an outrigger that aligns a drill sleeve with each hole in the plate. This allows percutaneous fixation of all but the proximal portion of the plate to bone. THE LISS system utilizes locking screws that attach securely to threaded holes in the plate, providing a fixed-angle internal fixator that can theoretically resist varus collapse of unstable proximal tibia fractures.

The fixed angle nature of the locking screws does not allow compression or reduction of bone to plate with tightening of screws. Gapes between bone and plate will remain after screws are tightened. Fracture reduction should be obtained prior to screw placement. Alignment will be maintained even if the plate does not precisely fit the bone.

Bending of the plate causes inaccurate aiming of the screws through the outrigger and is contraindicated.

Patients are positioned supine on a radiolucent table. A tourniquet is applied to the proximal thigh and the limb prepared and draped in the standard sterile fashion. Open fractures are irrigated and debrided.

A curvilinear incision is made over the proximal lateral tibia. The skin incision is approximately 6 cm in length for extra articular fractures and is extended as needed to provide exposure of the articular surface for intra-articular fractures. The fascia of the iliotibial band is divided longitudinally parallel to its fibres starting at the Gerdy tubercle and extended proximally. Dissection is extended distally through the fascia...
of the tibialis anterior muscle and a small portion of the muscle is elevated of the proximal lateral tibia. A submensal arthrotomy is made for intra-articular fractures.

When the fracture involves the articular surface, the articular segment is reduced anatomically and held provisionally with Kirschner wires (K-wires).

Based on preoperative planning, care is taken to place these screws in positions that do not interface with LISS screw placement.

Once the articular fragment and/or tubercle are reduced and at least provisionally stabilized, attention is turned to reduction and fixation of the articular segment to the shaft segment. The appropriate length LISS plate that provides at least four screws in the distal fragment is selected and assembled to the radiolucent outrigger. The plate is then guided though the surgical incision between the tibialis anterior muscle and the perosteum along the lateral tibia. The majority of the distal portion of the plate is placed percutaneously without direct visualization.

Once satisfactory alignment of the fracture and positioning of the plate is confirmed, the plate is secured to the proximal and distal fragments with 5.0-mm self-drilling, self-tapping locking screws. On average, 4 screws were used in the proximal fractures segment (range 3–6 screws) and 4 in the distal segment.

The outrigger is disassembled from the plate after removal of K-wires. The wound is irrigated. The iliotibial fascia and wound are closed over a drain in standard fashion.

DISCUSSION

Complex proximal tibia fractures including those with metaphyseal comminution present a difficult treatment challenge. In the current series, the use of the LISS plate system for treatment of complex proximal tibia fractures resulted in an excellent union rate. Obtaining proper alignment is technically demanding with the LISS system. To obtain optimal alignment when using the LISS system, it is important to understand that the unique properties of this fixed-angle plate and screw construct affects fracture alignment differently than traditional plating systems. Traditional constructs reduce bone to plate with the tightening of screws where the alignment of the fracture reduction is largely determined by the plate contour. If necessary, traditional plates can be bent to provide satisfactory reduction once bone is reduced to plate. Insertion of fixed-angle screws does not reduce bone to plate with screw tightening. Therefore, because all screws in the LISS system are locking screws, satisfactory alignment must be obtained independent of the relative contour of the bone and plate. If the bone is properly aligned without being completely in contact with the plate, then the fixed angle screws should be inserted to maintain this. Tightening the screws compresses plate to bone. Reduction is influenced by plate contour: alignment because reducing the bone to the plate with clamps or other instruments will only introduce malalignment.

CONCLUSION

The type and timing of surgical intervention must be guided by the degree of injury to the soft-tissue envelope and the patient's physiological demand. Articular fractures demand anatomical reduction and absolute stability to enhance the healing of articular fragments and make early motion possible.

In conclusion, the LISS internal fixator system can be used successfully to treat patients with complex proximal tibia fractures without the need for additional medial stabilization. Surgeons attempting to use fixed-angle internal fixation plating systems should familiarize themselves completely with the significant technical differences between these systems and traditional plating systems to assure satisfactory results, especially with regard to obtaining proper fracture alignment. We find that comminuted metaphyseal proximal tibia fractures with either simple or no articular extension are suited for treatment with the LISS system. When complex articular fractures exist, other plate and screw constructs may be preferable.