Introduction

Intra-articular fractures of the distal femur present a treatment challenge. The goal of surgical treatment is anatomical reconstruction of the articular surface followed by stabilization. Surgical treatment with open reduction and internal fixation (ORIF) has been recommended since the 1960s and has been shown to be superior to nonoperative treatment. Problems associated with non surgical treatment included nonunion, varus collapse, and arthrofibrosis. **(Rakesh , 2007)**

Although operative treatment was gaining popularity in the 1970s and 1980s, the dissection required for open reduction and internal fixation led to fracture fragment devascularization and an increased risk of delayed union, nonunion, infection, and implant failure when bone grafting was not done. **(Albert , 1997)**

The complications related to direct reduction techniques led to the development of new Concepts involved with indirect reduction techniques including reliance on soft tissue attachments to restore the mechanical axis, length, and rotation of the fracture without direct exposure of the fracture site, and the implant functions as an internal splint. The benefit is that the blood supply to the fracture fragments is maintained **. (Röstlund, 1987)**

In the 1990s, the success of these indirect reduction techniques for distal articular femur fractures were reported using conventional implants including the dynamic condylar screw, angled blade plate, and condylar buttress plate. Use of a lateral approach to the distal femur while avoiding direct fracture exposure and medial dissection led to early fracture callus

formation and decreased implant failure rates, infection rates, and need for bone grafting except in open fractures with bone loss **.(J Orthop 1996)**

The Less Invasive Stabilization Technique (LISS) plate, which uses locked screws and percutaneous fixation, also has been introduced. The LISS allowed higher elastic deformation than the other systems. this method has been encouraging; however, technically it is quite demanding. **(Canale, 2007)**

External fixation is typically reserved for those patients with open fractures with bone loss, vascular injury, associated significant soft tissue injuries, or extensive comminution. Reported benefits of external fixation include decreased surgical time and blood loss, and less disruption of the blood supply to fracture fragments**. (Frigg, 2001)**

If only one condyle is fractured, the operation is relatively simple, and because the **shaft** is not involved, internal fixation usually is secure enough to allow movement after a few days. Often condylar fractures can be reduced with traction on a fracture table and then fixed with a percutaneous lag screw. Open reduction is indicated for irreducible condylar fractures. **(Heiple, 1971)**