



## Case Report

# Close Comminuted Fracture in the Shaft of Femur: Managed by Open Reduction and Internal Fixation with Broad Dynamic Compression Plate (DCP) Without Stripping of Periosteum

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### Abstract

Management of close comminuted fracture in the shaft of femur in adult is a difficult task. Here we report a case who was managed by open reduction and internal fixation with broad dynamic compression plate without stripping of Periosteum.

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### Introduction

Management of close comminuted fracture involving more than 50% of the cortex of the shaft of femur in adult is a difficult task because close interlocking nailing is practically not possible in peripheral Medical College Hospital. In this case there was comminution with three butterfly fragment which was in unacceptable position in the shaft of the femur at the junction of middle and lower 1/3rd. In Tscherne classification it was grade 2 soft tissue injury<sup>1</sup>. Preoperative plan was open reduction and internal fixation with 12 hole broad DCP without stripping the periosteal hinge. There is danger inherent in the mechanical efficiency of our modern methods, danger lest the craftsman forget that union cannot be imposed but may have to be encouraged. Where bone is a plant with its roots in the soft tissues and when its vascular connections are damaged, it often requires, not the technique of a cabinet maker, but the patient care and understanding of a gardener<sup>2</sup>. For the dealings of trauma, an orthopaedic surgeon must combine the knowledge of systemic effects

of trauma including immunologic impairment, malnutrition, pulmonary and gastrointestinal dysfunction, in planning with the timing and the type of surgical intervention required. This rarely is a cut and dried decision because of the number of treatment options available and because no treatment is without complications<sup>2</sup>.

### Case Report

Mr. X, a young man of 30 years sustained head on collision between a police van and his motor cycle having trauma in his right thigh and also in different parts of the body. The thigh was swollen and deformed. He was unable to move. There was multiple abrasion in the body. Initially the patient was resuscitated with intravenous fluid, blood, antibiotic, analgesic and immunized with tetanus toxoid. Abrasions were toileted and dressing was made properly. Surface traction was applied in his right lower limb.

Patient was normotensive, non diabetic and without any systemic diseases. X-ray findings revealed comminuted fracture at the junction of

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middle and lower 3rd of right femur Cortex involvement was more than 50% with 3 butterfly fragments. Alignment was acceptable.

The case was operated after 12 days of accident. During operation, muscles were stripped incompletely with care from the lateral side of the fracture fragments without disturbing the periosteum of biological tissue at the fracture site. It was possible to fix the 3 fragments in situ with cortical screws. Then 12 hole broad dynamic compression plate was placed on lateral side of the femur. The plate was fixed with 11 screws. Wound was closed in two layers leaving a close drain. Third generation cephalosporine was administered for 6 weeks.

The patient was advised rest and non-weight bearing for 6 weeks, then crutch walking with toe touch is allowed. Quadriceps drill was taught 1 week after operation and controlled knee bending exercises was allowed after 2 months. After two and half months gradual weight bearing was advised.

### Discussion

With the complexity of the procedure in the management of such type of fracture requires extensive preoperative planning with careful analysis of the fracture and the extremity, much as an architect would develop a plan for construction a building. Before treatment can be determined, the environment of the fracture including its vascular supply, muscle tendon unit damage, skin coverage, the degree of soft tissue damage, the amount of neurological damage, the microbiology of the environment, the availability of nutritional support and the physical and mental status of the patient must be determined. With an accurate evaluation of the fracture environment, the type of fracture stabilization selected should successfully induced one type or combinations of types of fracture healing.

The primary responsibility of the orthopaedic surgeon is the prevention of functional deformity, to obtain union of the fracture in most anatomic position compatible with maximum functional return of the extremity.

It is impossible to intervene surgically without adding further injury to the extremity, the technique chosen should minimized addition soft tissue damage and bony injury. An anatomic reduction obtained at the expense of total devascularization of the fracture fragments is not a well planned or well executed procedure. The mechanical stresses that will be applied to the extremity and planned internal fixation also must be considered. If the biology of fracture is so disturbed that fracture healing does not occur, the implant or explant construct will predictably fail.

Before attempting a complicated open reduction and internal fixation, the surgeon must consider his training, his familiarity with that procedure and his surgical ability. A patient should be fully informed of the rewards and risks of the surgical methods chosen and should to cooperate in the required rehabilitation. If the patient is not dependable and cooperative, non-operative methods of treatment may be a wiser choice. Biologic intervention in the management of injured extremity with the increased success of free tissue transfers, the development of osteoconductive biomaterials and possibly in near future, the development of bioinductive materials may be the future guide approach. The use of electrical stimulation is still under evaluation<sup>1</sup>.

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