



A Study of Combined Management of Fracture Distal End of Femur With Patellar Fracture in Tertiary Health Care Centre in Central India.

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ABSTRACT

Background-Fractures of distal femur & patella had been seen as separate entity. But being parts of joint they should be treated as a unit. Hence this study aims at treating the fractures together & assessing the postop outcomes.

Methods-The study is longitudinal observational study of 37 patients with combined distal femur & patella fractures. A predesigned proforma was used for data collection. Patients were followed 18 months post operatively. Patient's functional results were evaluated using Friedman and Wyman scoring system.

Results- Average age of presentation was 36.5+ 14.14 years. In total 13.51% patients had poor scoring. Intra-articular fractures of distal femur ($P < 0.03$) & non operatively treated patients of fracture patella had $< 90^\circ$ range of motion (ROM) ($P < 0.0002$).

Conclusion-Combined operative management of fractures of distal femur & patella have better restoration of ROM.

KEYWORDS : Fracture distal femur, Friedman and Wyman scoring, range of motion.

Introduction- The fractures of distal femur with fracture patella present a huge surgical challenge. These fractures are difficult to treat and operative treatment is usually recommended for favorable outcome⁽¹⁻⁴⁾. These are associated with high energy trauma (in the youngsters) and osteoporotic bones (in the elderly)⁽⁵⁾ and are frequently comminuted and intra-articular.

The goal in treating supracondylar femur fractures, as in treating any periarticular fracture in a weight bearing bone, is restoration of a stable limb for functional, pain-free ambulation and restoration of good range of motion. Initially, fixation and, finally, healing of the bone restores stability. Maintaining anatomic alignment and length and preventing stiffness restore function. Avoiding arthritis, which requires restoration of anatomic congruent joint surfaces and maintaining the normal mechanical axis of the limb, prevents pain.⁽⁶⁾

Supracondylar femur fractures require anatomically stable internal fixation for best results. Historically, traction achieved adequate results for the treatment of these fractures; however, the outcomes probably would not be considered acceptable today. Maintaining leg length and preventing varus mal-alignment is difficult with traction. Although surgical risks were avoided, the patient was exposed to the risks of prolonged bed rest, including pulmonary complications, deep venous thrombosis, pressure ulcers, disuse osteoporosis, and generalized muscle atrophy and deconditioning.^(6, 7) These complications could be best prevented with operative methods.⁽⁶⁾ As with this intervention in cases of involvement of the articular surface that demands a congruent anatomic reduction prevents or minimize post-traumatic arthritis and provides bone stock for later knee replacement or fusion.⁽⁶⁾

Patella fractures account for approximately 1% of all skeletal injuries⁽⁸⁾. Supracondylar fracture with fracture of patella can occur as patella is located subcutaneously location that makes it prone to injury. Fractures occur as a result of a compressive force (as occurs with a direct blow), a sudden tensile force (as occurs with hyper flexion of the knee), or a combination of these.⁽⁸⁾ These fractures become problem-

atic if the extensor mechanism of the knee is nonfunctional, articular congruity is lost, or stiffness of the knee joint ensues. To avoid these problems, the surgeon must achieve anatomic restoration of the joint and must allow early motion.⁽⁸⁾ Hence operative intervention is recommended to allow stable fixation, early motion, and improved rates of bony union.⁽⁸⁾

The patients with supracondylar fractures with patellar fractures are multiple trauma victims with an array of other skeletal, abdominal, head and chest injuries. In the course of management of these cases, the initial concern is stabilizing the general condition and preservation of the life & subsequent treatment of extremity injuries. The study is conducted at tertiary health care center with influx of large number of trauma patients. In the past there are limited citations available for combined supracondylar & patellar fractures. Hence this study aims to evaluate functional outcome, fracture healing, and the complications of supracondylar fractures with fractured patella.

Methods- This prospective observational longitudinal study was conducted at Department of Orthopaedics, Gandhi Medical College and Hamidia Hospital, Bhopal between July 2014 and December 2015. Due ethical clearance was taken from ethics committee of institution. A proforma was formulated & pilot tested. All the participants of study were informed about their inclusion in study & their informed consents were taken. All the patients with 18- 70 years having closed fractures of ipsilateral distal femur and fracture patella were included in study. The patients with pathological fractures or those having any Medical contraindications to surgery were excluded. Patients were observed for 1-1.5yrs post operatively. Pre & post-operative X-ray were observed & findings were noted along with proforma. Various modalities of treatment were used as per patients requirements. Wound inspected on 2nd, 5th and 8th postoperative day & suture removal was done on the 12th postoperative day. All the patients were mobilized within 48-72 hours of surgery. Gentle active range of motion started at 2nd post-operative day except where patella is not fixed, in those cases active range of motion starts at 12-14 weeks. Patients functional results were evaluated using the scoring system of

Friedman and Wyman⁽⁹⁾ in which the scoring was done on the basis of Activities of Daily Living (ADL)- Good-No limitations of activities of daily living, <20% loss of hip or knee motion. Fair- mild limitations of ADL, mild to moderate pain, 20-50% loss of hip or knee motion. Poor-moderate limitations of ADL, Severe pain, <50% loss of hip or knee motion. In total 37 patients were included in the study.

Result- Average age of presentation was 36.5+ 14.14 years. Male's outnumbered females M: F-1.64:1. Almost 75.68% were road traffic accident victims. Surgical intervention was done in all patients with distal femur fractures & in 83.78% patients with fracture patella. Most common method to manage distal femur fracture used was locking plate & Tension band wiring in fracture patella. Average time to union was 18.6 weeks (range 14 -20 weeks). In total 86.49% patients had an uneventful recovery & 5.41%(2/37) patients had non union of fracture. In total 13.51% patients had poor scoring i.e. moderate limitations of ADL with range of motion <90°. A statistically significant association was seen with range of motion post operatively & type of femur fracture. i.e extra-articular fractures had better range of motion. Also range of motion is statistically significantly associated with operative management of patellar fractures. Those who were operated had better scores.

Discussion-

Most of the patients in study were males & were road traffic accidents victims and were under 40 years. All patients with distal femur fractures were operated. As a non-surgical treatment is a rare option⁽¹⁰⁾. Locking plate was best modality of treatment as stated by M Ehlinger & etal also Functional recovery was found to be very good with 80% of good and very good results. They concluded that the locking plate system allows early mobility, rapid functional recovery and good radiological results with low morbidity, even when used in intra-articular fractures.⁽¹⁰⁾ However, there seems to be a tendency towards progression to arthritis in intra-articular fractures.⁽¹⁰⁾

Tension band wiring is satisfactory method of reducing fractures of patella & helps in acquiring greater range of motion. This observation is similar to as stated by Hung etal⁽¹¹⁾ It was observed that there is significant restoration of knee movement in operating extrarticular cases (p<0.05). Also operating fracture patella along with distal femoral fractures help in achieving greater range of movement as compared to adopting conservative methods (P<0.05). Hence it is recommended that distal femur fractures with fractures of patella should be managed operatively.

Limitations- Intra-articular fractures have poor prognosis despite using all means to restore joint functions. This gives an opportunity for further research which could not be done in current study.

| Table -1 | N-37 | % |
|------------------------------|------|-------|
| Age wise distribution | | |
| <30yrs | 12 | 32.43 |
| 30-39yrs | 10 | 27.03 |
| 40-49yrs | 9 | 24.32 |
| 50-59 | 3 | 8.11 |
| >60yrs | 3 | 8.11 |
| Total | 37 | |
| Sex wise distribution | | |
| Male | 23 | 62.16 |
| Female | 14 | 37.84 |
| Total | 37 | |
| Type of injury | | |
| RTA | 28 | 75.68 |
| Fall | 8 | 21.62 |
| Others | 1 | 2.70 |
| Total | 37 | |

| Table -2-Distribution of patients on the basis of type of fracture | | |
|--|----|-------|
| Intra-articular | 24 | 64.86 |
| Extra-articular | 13 | 35.14 |
| Total | 37 | |
| Type of management distal femur # | | |

| | | |
|--|----|-------|
| Compression Plating | 24 | 64.86 |
| IM Nailing | 13 | 35.14 |
| Type of management of patellar# | | |
| TBW | 21 | 56.76 |
| Circumferential wiring | 8 | 21.62 |
| CC screw | 2 | 5.41 |
| Conservative | 6 | 16.22 |
| Distribution of patients on the basis of post op outcome | | |
| Good | 18 | 48.65 |
| Fair | 14 | 37.84 |
| Poor | 5 | 13.51 |

| Table-3-Distribution of patients on the basis of type of distal femur fracture & range of motion | | | |
|--|-------------|-------------|------------|
| | >120 | 90-120 | <90 |
| Extra-articular | 10 (27.03%) | 2 (5.41%) | 1 (2.70%) |
| Intra-articular | 8 (21.62%) | 12 (32.43%) | 4 (10.81%) |
| Total | 18(48.65%) | 14(37.84%) | 5(13.51%) |
| Chi sq-6.47 df-2 p-0.03 | | | |
| Distribution of patients on the basis of range of movement & type of management of patellar fracture | | | |
| | >120 | 90-120 | <90 |
| Conservative | 1 | 1 | 4 |
| Operative management | 17 | 13 | 1 |
| Total | 18 | 14 | 5 |
| Chi sq-17.33 df-2 p-0.0002 | | | |

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