



TO EVALUATE THE OUTCOME OF SUB-TROCHANTERIC FRACTURES TREATED BY OPEN REDUCTION AND 95 DEGREE DYNAMIC CONDYLAR PLATE: A RETROSPECTIVE STUDY OF 30 CASES.

Orthopaedics

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ABSTRACT

Introduction: Sub-trochanteric fractures have always posed a challenge with regards to selecting right implant. Both intra-medullary and extra-medullary implants have been used with varying success and failures. Recent studies have increasingly favoured the use of intra-medullary fixation. However not all fractures are amenable to this method and at times on failure of intra-medullary implants the choice falls back on extra-medullary implants. Aim of our study was to evaluate the outcome of 95 degree Dynamic Condylar plate fixation in sub-trochanteric fractures.

Methods: This retrospective study of 30 patients was done by including patients who fulfilled the inclusion and exclusion criteria. Patient details were noted and regular follow-up of patients was done till one year post-op phase. Patients who did not turn up for final followup were excluded. Type of fractures were classified based on Mullers classification. Final evaluation was done using Harris Hip Score. **Results:** In this series of 30 patients, 12 were type A, 11 were type B and 7 were type C fractures. Average operative time was 97 min and increased from type A to type C fracture. Average radiation exposure was 118 sec. Average union time was 23.6 weeks. There were 3 cases of superficial infection and 4 cases of implant bending. Based on Harris Hip score we had Excellent results in 43.3 %, Good results in 30 %, Fair results in 10 % and Poor results in 16.7 % cases.

KEYWORDS

INTRODUCTION :

Sub trochanteric area extends from lesser trochanter of femur to a point upto 5 cm distal to it. (1) Prevalence of this fracture ranges from 10 % to 34 % of all hip fractures. (2). It follows a bimodal pattern of distribution wherein young patients get this fracture due to high impact trauma whereas, elderly suffer due to trivial trauma (3). High amount of bending and torsional stress in this area (roughly 1200 pound/sq. inch), coupled with strong deforming pull of muscles around hip causes a lot of shear stress in this region. (4) Conservative treatment of these fractures has been highly unsatisfactory, warranting operative intervention. Different methods of fixation, both intra-medullary and extra-medullary, have been performed for these fractures over so many years. Each method of fixation has its own set of advantages and disadvantages. Intra-medullary device provides more biological fixation and offers advantages in form of minimal soft tissue damage, less blood loss, less operative time, and early rehabilitation. However not all fractures are amenable to this procedure. Extra-medullary devices have also been equally effective mode of treatment for such fractures. In fact some fracture patterns are more suitable for these devices rather than intra-medullary devices. A large meta-analysis was done by Liu, Xing Wu et al and they concluded that there was no significant difference in the final outcome of both types of fixation (5). However multiple recent comparative studies have conclusively proven that intra-medullary fixation seems to have better outcome than extra-medullary fixation. In our retrospective study we aim to evaluate the outcome of 95 degree dynamic condylar plate fixation in sub-trochanteric fractures

- 1) Pathological fracture
- 2) Open fracture.
- 3) Patient with neurological or psychiatric disorder.
- 4) Patients lost to follow-up.

All patients underwent standard pelvis with both hip AP and affected side knee with femur xrays. Fracture was classified using Muller's classification into type A, B and C. (Figure 1). Demographic details of the patients were recorded in a given proforma. Preoperative assessment was done by anaesthesia team and once fitness for surgery was given patients were posted for surgery. All patients were given spinal anaesthesia and operated on traction table under C-arm guidance. Standard lateral incision of appropriate length was taken based on fracture type. Once anatomical reduction was achieved guide pin was placed and confirmed under C-arm. Richard screw of Appropriate length was inserted and dynamic condylar plate of required size was applied over the screw and held to shaft of femur. Cortical screws were used to fix the plate. Final fixation was confirmed under C-arm. Wound was closed in layers after saline wash and sterile dressing applied. Post-op xrays were taken for record purpose. Stitch removal was done at around two weeks. Patient was advised non-weight bearing for 6 to 8 weeks. Regular follow-up was done at 1 month, 3 months, and then at monthly interval till fracture union was seen. Final evaluation was done at 1 year post op using the Harris Hip Scoring system.

MATERIALS AND METHODS:

A retrospective study was conducted at GMERS Medical College, Gotri, Vadodara, a tertiary care centre. All patients who had undergone ORIF by 95 degree DCS for fracture sub-trochanter from Jan 2018 to Dec 2023 were included in the study based on following inclusion and exclusion criteria.

Inclusion Criteria:

- 1) Age more than 18 yrs.
- 2) Unilateral sub-trochanteric fracture.
- 3) No other skeletal or systemic injury.
- 4) Medically fit patient for surgery.
- 5) Final follow up at one year post surgery.

Exclusion Criteria:

Muller's Classification:

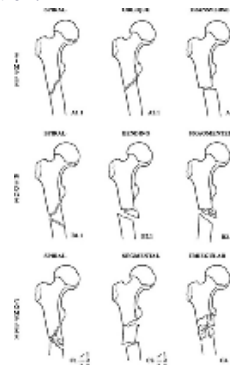


Figure 1. C.L. Loizou, I. McNamara, K. Ahmed, G.A. Pryor, M.J. Parker, Classification of subtrochanteric femoral fractures injury
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Pre-op x-ray of case no:06



Post-op x-ray of case no:06 Ap view



Post-op x-ray of case no:06 Lateral view



Pre-op x-ray of case no:04



Post-op x-ray of case no:04



Post-op xray of case no: 04 One year follow-up.



Pre-op x-ray of case no:10



Post-op x-ray of case no:10



Pre-op x-ray of case no:24**Post-op x-ray of case no:24****post-op x-ray of case no:24 failure at one month post-op.****RESULTS:**

In our series of 30 patients, mean age was 58 years with a range of 23 to 85 years. 17 were males and 13 females. Mode of injury was vehicular accident in 11 cases and domestic trauma in 19 cases. Based on Muller's classification, 12 were type A, 11 were type B and 7 were type C fracture. Average interval between injury and admission was 1.5 days with a range of 0 to 5 days. Mean admission to operation interval was 4.4 days with a range of 1 to 9 days. Average hospital stay duration was 9.1 days with a range of 4 to 16 days. Average surgical time was 97 min with a range of 70 min to 150 min. Average duration of radiation exposure was 118 sec with a range of 60 sec to 200 sec. Average blood loss was 373 ml with a range of 250 ml to 500 ml, (as measured by Mop count. Each soaked mop was counted as 50 ml blood loss.). Average union time was 23.6 weeks with a range of 18 to 32 weeks. Superficial wound infection was seen in three patients (10 % incidence) which healed eventually by dressing and antibiotics. Implant bending or breakage was seen in 4 cases with an incidence of 13.3 %. All these patients had started early weight bearing. Refixation was done in these cases without any bone grafting and eventually the fracture united.

DISCUSSION:

Sub-trochanteric fractures have always been a difficult challenge for all orthopedic surgeons. There is still a lot of difference of opinion regarding the best type of implant. (4). Both intra-medullary and extra-medullary implants have been used for management of these fractures with varying results by different surgeons (6). Intra medullary fixation provides better preservation of biology, early mobilization and weight bearing and also shortens the hospital stay. However there is increased exposure to radiation. (7,8) At times the operative time also increases and there is lesser hold of implant in proximal fragment. In CRIF there are chances of sub-optimal anatomical reduction of fracture. All these can lead to early implant failure, delayed union, non-union and at times revision surgery. (9,10) Open reduction using DCS provides direct visualization of fracture. It leads to better and near anatomical reduction of large fragments. Medial wall restoration of proximal femur is better achieved by 95 DCS. Use of inter-fragmentary screws is also possible for near anatomical reduction. Lateral wall reconstruction and reinforcement is better with DCS. Richard screw along with one or two cancellous screws in proximal fragment into

calcar region strengthens the fixation in proximal fragment thereby preventing varus and rotational deformity. (11)

Average operating time for DCS was around 97 min in our study which was comparable to studies by Halwai MA et al (80 mins) and V. Sharma et al (92 mins). (12,13). Average blood loss in our study was 373 ml which was comparable to studies by Neher et al (418 ml) and Vaidya et al (430 ml). Two units of blood transfusion was done in our study group one intra-op and one post-operatively in almost all patients. Average radiation exposure in our series was 118 sec with a range of 60 to 200 sec. our incidence of wound infection was 10 % which was in line with several studies. Rohilla R et al in their series had union at 16 weeks. Yoo MC et al had union at 19 weeks. Laghari MA et al had union time of 18 weeks. (14-16). Average union time in our series was 23.6 weeks with a range of 18 to 32 weeks. All fractures had eventually united in our series at the end of one year follow up. Based on Harris Hip score in our series we had excellent results in 43.3 % cases, Good results in 30 % cases, Fair results in 10 % cases and Poor results in 16.7 % cases.

CONCLUSION:

Dynamic condylar plate is a very surgeon friendly implant to use. It provides a strong and stable construct especially in cases of lateral wall burst fractures. It minimizes radiation exposure duration. Besides the Richard screw, dynamic condylar plate allows for placement of two additional screws in calcar region thereby preventing varus collapse and avoiding rotational malalignment. Inter fragmentary screws can additionally aid in near anatomical reduction and alignment in case of comminuted fractures. Only drawback of this device is longer skin incision, extensive soft tissue stripping, drainage of fracture hematoma, delayed weight bearing, and theoretical increase in chances of increased incidence of infection.

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Conflict Of Interest: None

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