

Research Article
Orthopaedics

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USE OF 95 DEGREE CONDYLAR BLADE PLATE IN COMPLEX PROXIMAL FEMUR FRACTURES

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Abstract:

Background- Angled Blade Plates have been introduced in the 1960s by the AO and Synthes and belong still to surgeons basic armatorium used for fracture treatment, revision surgery and correction osteotomies. They serve as a tension band plate whenever possible (i.e., condylar plates with medial bony buttress). Due to their fixed-angle shape, successful application needs careful planning, concise orientation in all planes (AP and lateral views, rotation) and precise preparation of the channel for the blade.

The purpose of this study was to study the use of 95 degree condylar blade plate in complex proximal femur fractures and evaluate the results for union rates, complications and functional outcomes.

Methods- Total 8 patients with complex proximal femur fractures were studied. The inclusion criteria for this study was age more than 18 years, all complex proximal femur fractures where nailing is not possible because of involvement of entry point and where proximal containment of the nail is not possible. Other indications were Narrow Medullary Canal, Non availability of the medullary canal because of distal femur fixation with an implant, while pathological fractures and fractures in less than 18 years people were not included.

Results- Among the 8 cases studied 5 (62.5%) were male and 3(37.5%) were females. Mode of injury in most of the patients was road side accidents. 1 case

had to re-operate because of repeat fall. According to kyles criteria good to excellent scores were achieved in 8 out of 8 patients.

Conclusions- 95 degree condylar blade is an effective method of reduction of complex proximal femur fractures where nailing is impossible or is extremely difficult.

Key words: Angled plates, proimal femur fracture, fracture reduction, condylar blades

Introduction

The Proximal femoral fractures account for a large proportion of hospitalization among trauma cases.¹ The complex proximal femoral fractures require special methods of treatment and have their own set of complications and controversies regarding the optimal method of management. Studies have reported various methods of extra medullary or intra medullary fixation in the management of these fractures. The biomechanical aspects of an individual implant for these fractures need to be considered and the best device for each specific fracture pattern should be selected to increase the possibility of a favorable outcome.² Currently, there are only a few published articles that report the use of the fixed angled blade plate, particularly a 95 degree angled blade plate, to treat complex proximal femoral fractures.^{3,4,5} The purpose of this study is to clarify the efficacy of using a 95 degree angle blade plate fixation in the treatment of complex proximal femoral fractures.

Definition, classification and anatomical boundaries between fracture neck of femur, inter trochanteric fracture and sub trochanteric fracture has been well studied and well defined but there is a gray area when the fracture extends beyond the anatomical line of neck of femur, inter trochanteric area or the sub trochanteric area. Nowadays we are getting a lot of high velocity trauma, when fracture in the proximal femur is difficult to classify as fracture neck of femur, inter trochanteric fracture or sub trochanteric fracture as the fracture involves all the three zones of proximal femur namely the basal neck, the trochanter and the sub trochanter.

Though these types are rare but cases do occur especially in high

energy trauma involving relative younger population. In the younger population, the major differences in physiology, injury characteristics and activity level necessitate a dedicated treatment pathway to restore the relationship of head-neck and the greater trochanter.⁶ In literature, these fractures are simply labeled as fracture proximal femur with sub trochanteric extension and labeled as comminuted proximal femoral fractures. No separate classification and guidelines exist for treatment of these proximal femoral complex fractures. Surgical stabilization of the proximal femur fractures is one of the most currently performed orthopaedic procedure.⁷ The goal of surgical intervention is to achieve anatomical reduction with a stable fracture fixation which helps bone union and allows early mobilization from the biomechanical view point.⁸ The cephalomedullary nailing is the gold standard treatment in these fractures and has various advantages, namely shorter operating times and less blood loss, as well as lower rates of infection, non-union, and implant failure^{9,10,11,12} but few fractures are impossible to nail or extremely difficult to nail.

For cephalomedullary nail to be effective, proximal containment of the nail within the bone is must. It decreases the primary stability of the nail. In the absence of containment, because of comminution in the entry point, the nail just hangs on the two screws inserted to the head and neck which compromise the primary biomechanical stability of the nail.

Methods

This prospective study was carried out in the department of orthopaedics in Sri Guru Ram Das Institute of Medical Sciences and Research. Total

8 patients were taken and preoperative evaluations and x rays were taken to assess the injury.

The fracture was approached through lateral approach. The patient was put on spica table. Formal open reduction was not attempted. Then via lateral incision, firstly if there is separation between greater trochanter and the head-neck fragment, the greater trochanter and the head-neck fragments are assembled together in proper alignment and fixed with 3.5mm inter fragmented screw. Next channel of blade was prepared as per preoperative planning (in AP view to restore the neck-shaft angle of the opposite normal femur and central in lateral view).

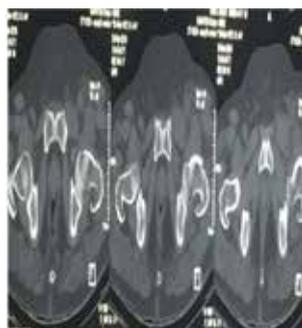
The proximal fragment was fixed with one/two additional screw going to the calcar region for the shaft fragments. Formal open reduction was not attempted. The fragments were grossly aligned with minimum dissection and the fracture zone was bypassed with plate and fixed with 4-5 screws distally.

If the fracture lines are simple then the fracture was put under load with the help of interfragmentary screw by putting the lateral cortex under compression. In the presence of comminution every attempt was made to put the lateral cortex under compression. No medial compression was done. No lever was put on the medial side. No medial soft tissue stripping done. Attempt to fully or partially load the fracture site was done which is a prerequisite for any plating technique.

Results

8 cases were studied out of which 5 were male and 3 were female. Mode of injury in 5(62.5%) was road side accident while 3(37.5%) patients had

a history of fall.7(87.5%) patients were less than 50 years of age. Partial weight bearing was started at 8-12 weeks in the patients treated with 95 degree condylar blade plate. The mean was 10.53 weeks in these patients. The mean stay of these patients in the hospital was 8-12 days(10.4). Eight patients came for follow up. Radiological union occurred between 14-18 weeks (16.2). 1 out of the 8 patients had a fall for which he was operated again after 1 month.



Pre operative ct scan , xray left hip and post operative x rays of the patient jagjit singh treated with 95 degree condylar blade plate



Pre operative and post operative x-rays of a 28 yr old female treated with 95 degree condylar blade plate



Due to narrow medullary canal, 95 degree condylar blade plate was used in place of cephalomedullary nail.

According to KYLES criteria excellent results were seen in 5 out of 8(62.5%) patients and good outcome was seen in 3(37.5%) cases.

Kyles Criteria Results	Number Of Patients	Percentage
Excellent	5	62.5%
Good	3	37.5%
Fair	0	0
Poor	0	0

Discussion

Proximal femur fractures should be treated with intramedullary devices which are the gold standard for their treatment but there are certain circumstances when nailing is extremely difficult or cannot be done due to non negotiable non-containable entry point. Extramedullary devices such as 95 degree condylar blade plate can be used effectively in these complex proximal fractures. The 95 degree angled blade plate is a recommendable alternative treatment of unstable proximal femoral fractures. The surgical technique is technically demanding but can be a viable option for patients with these difficult fractures. Thorough preoperative planning, attaining an anatomic reduction, minimal medial soft tissue dissection, and secure fixation using screws and wires will

ensure an optimal outcome.

Best results are achieved with proper surgical technique. Medial soft tissue was intact but as it is with any plating technique, every attempt should be made to put lateral cortex under compression. Therefore, condylar blade plate should be used when the fracture can be fixed and loaded anatomically, at least laterally. In the absence of lateral cortex compression, there is increased degree of implant failure. Using the condylar blade plate in the bridge mould carries increased complication rate because the plate then becomes a load bearing device and increases the mechanical stress in the proximal femur and carries increased risk of implant failure.

References

1. Mittal R, Banerjee S. Proximal femoral fractures: Principles of management and review of literature. J ClinOrthop Trauma. 2012;3(1):15-23.
2. Seinsheimer F. Subtrochanteric fractures of the femur. J Bone Joint Surg Am. 1978;60:300-6.
3. Asher MA, Tippet JW, Rockwood CA, Zilber S. Compression fixation of subtrochanteric fractures. ClinOrthopRelat Res. 1976;(117):202-8.
4. Brien WW, Wiss DA, Becker V Jr, Lehman T. Subtrochanteric femur fractures: a comparison of the Zickel nail, 95 degrees blade plate, and interlocking nail. J Orthop Trauma. 1991;5(4):458-64.
5. Kinast C, Bolhofner BR, Mast JW, Ganz R. Subtrochanteric fractures of the femur. Results of treatment with the 95 degrees condylar blade- plate. ClinOrthopRelat Res. 1989;(238):122-30.
6. Pauyo T, Drager J, Albers

- A, Harvey EJ. Management of femoral neck fractures in the young patient: A critical analysis review. *World J Orthop.* 2014;5(3):204-17.
7. Suriyajakyuthana W. Intertrochanteric fractures of the femur: results of treatment with 95 degrees Condylar Blade Plate. *J Med Assoc Thai.* 2004;87(12):1431-8.
 8. Lin KJ, Wei HW, Lin KP, Tsai CL, Lee PY. Proximal femoral morphology and the relevance to design of anatomically precontoured plates: a study of the chinese population. *ScientificWorldJournal.* 2014, Article ID 106941, 6 pages, 2014. doi:10.1155/2014/106941
 9. Whatley JR, Garland DE, Whitecloud T 3rd, Whickstrom J. Subtrochanteric fractures of the femur: treatment with ASIF blade plate fixation. *South Med J.* 1978;71(11):1372-5.
 10. Van Doorn R, Stapert JW. The long gamma nail in the treatment of 329 subtrochanteric fractures with major extension into the femoral shaft. *Eur J Surg.* 2000;166(3):240-6
 11. Barquet A, Francescoli L, Rienzi D, Lopez L. Intertrochanteric-subtrochanteric fractures: treatment with the long Gamma nail. *J Orthop Trauma.* 2000;14(5):324-8.
 12. Rahme DM, Harris IA. Intramedullary nailing versus fixed angle blade plating for subtrochanteric femoral fractures: a prospective randomised controlled trial. *J OrthopSurg (Hong Kong).* 2007;15(3):278-81.