

Basicervical Fracture of Neck Femur Treated With DHS And Derotation Screw- A Prospective Study of 30 Cases

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Abstract

Introduction: Basicervical region of femoral neck consist of that part of proximal femur located just proximal to or along the intertrochanteric line through the base of the femoral neck at its junction with the intertrochanteric region. In our study we try to observe the results of fixation of basicervical fracture neck of femur with dynamic hip screw with derotation screw

Methodology: 30 cases of basicervical fracture neck of femur with age >18 yrs were treated by DHS with Derotation Screw(DRS) and followed up regularly

Results: Most of the patients were between the age group of 50-60 yrs with male : female ratio being 3:1. In all our cases union was observed and average time for union was 13 weeks. There were 2 cases of superficial infection and 4 cases of non specific hip pain. There was excellent result according to Harris hip score in 73.33% cases.

Conclusion: From our study we conclude that DHS with DRS is an effective and safe method for fixation of basicervical fractures of neck of femur with minimal complications.

Keywords: Basicervical neck femur, DHS, Derotation Screw, Harris Hip Score

I. Introduction

Basicervical fractures are a unique type of hip fracture occurring at the base of the neck of proximal femur. Basicervical region of femoral neck consist of that part of proximal femur located just proximal to or along the intertrochanteric line through the base of the femoral neck at its junction with the intertrochanteric region. Due to this location, it represents an intermediate form between femoral neck and the intertrochanteric fracture. Although it is generally acknowledged that basicervical fractures are extracapsular, this may not always be the case. There has been considerable controversy in recent decades as to whether basicervical fractures should be managed as high intertrochanteric fractures or low neck fractures. True picture of basicervical fractures may nevertheless be obscured by the fact that they are, almost invariably, included in the broader group of fractures of the trochanteric region. However basicervical fractures have greater biomechanical instability than stable intertrochanteric fractures due to their greater fracture angle and subsequent greater varus moment and may lead to poor functional outcome. Also because of its location these fractures carry theoretically higher chances of Osteonecrosis. In our study we try to observe the results of fixation of basicervical fracture neck of femur with dynamic hip screw with derotation screw .

II. Methodology

The study was conducted in GMCH department of Orthopaedics from July 2015 to June 2016 and cases were followed up for a minimum period of 8 months with average follow up being 12 months. 2 patients were lost to follow up after 8 month follow up but they were included in the study.

30 cases of basicervical fracture neck of femur with age >18 yrs were treated by DHS with Derotation Screw(DRS) and followed up regularly. Patient with age < 18 yrs, Medical contraindications for surgery, Inability to take part in post operative rehabilitation & those with Open fractures were excluded from the study. A thorough clinical examination was carried out. The initial radiographs included AP view of the pelvis with both hip, AP & Lateral view of the affected femur with the hip joint. The level of fracture was determined and special attention was paid to the possibility of an extension of a fracture line into the cervical or trochanteric region. If any extension was found the case was excluded from the study. Patient and the family is then explained about the nature of the fracture, prognosis of non operative and operative treatment and also regarding the need for open reduction and internal fixation in their case. The patient and his family members were explained about the study and consent was taken if they agree to be a part of the study.

The patients were prepared for surgery under GA/SA/EA. The injured part was shaved and meticulous antiseptic dressing was carried out in the evening before the day of surgery. A preoperative intravenous injection of 1.5 gm CEFTRIAZONE+ SULBACTAM and 500mg of AMIKACIN was administered about half an hour before surgery after negative skin test and continued 12 hourly for 3 days. From the 4th day, 500mg of CEFUROXIME AXETIL and 200mg of OFLOXACIN were given orally 12 hourly upto 7 days.

The anaesthetized patient was placed supine on a fracture table and the extremities are secured to the traction foot piece. Closed reduction was tried first under IITV. If it failed open reduction was carried out under direct vision.

Reduction was categorised as good if the femoral neck angle was $<10^{\circ}$ of varus or $<15^{\circ}$ of valgus compared to the contra lateral hip [1] and the displacement between the fragments was <3 mm on both AP and lateral radiographs with trabecular angle of 160° to 170° in AP radiograph and trabecular angle of 170° to 190° in lateral radiograph.

A standard lateral approach to trochanteric region and proximal shaft was made. The entry point for the guide pin insertion was marked approximately 2 cm below the trochanteric flare, just opposite the tip of the lesser trochanter, midway between the anterior and posterior cortices. The lateral cortex was drilled with a 2mm drill bit. The threaded guide pin was inserted into the femoral neck and head with the help of 135° angle guide pressed against the middle of the femoral shaft. The guide pin was placed as centrally as possible inside the femoral neck and head in both AP & lateral view and advanced into the subchondral bone under IITV guidance. With the direct measuring gauze slid over the guide pin, the length of the pin within the bone was read off directly. The additional anterior frontal K-wire was removed.

Another pin (2.4 mm) was inserted 13mm proximal to the first pin, taking care that both pins were parallel so that the later did not come in the way during insertion of the lag screw.

We insert a cannulated drill bit over the 2.4 mm guide pin and pass it upto the subchondral bone. Then we remove the drill bit and tap the tract and insert 6.5 mm cannulated cancellous screw with washer which acts as derotation screw.

The DHS triple reamer was set to correct depth so that the reaming ended 10 mm sort of subchondral bone. Tapping was continued until the required length as marked on the tap. Lag screw was driven into the femoral head by turning the wrench until the zero mark on the wrench reached the lateral cortex which meant the tip of the screw was 10 mm from the articular surface. With the impactor, the plate is seated against the lateral femoral cortex. The plate was fixed with the femoral shaft by proper length 4.5mm cortical screws. In all cases 4 hole plate was used and a long barrel (38 mm) was selected to get a proper sliding action. The traction was released at this point and compression of the fracture was achieved with the compression screw put inside the lag screw.

The wound was closed in layers using a non-absorbable suture material. Sitting up in bed was encouraged on the first post operative day. Quadriceps exercise and range of movement exercises of the hip and knee started on the first day after surgery within limits of pain. The general supportive measures were taken and stitches were removed on tenth to fourteenth post operative day. Then progressive weight bearing was started once 1st evidence of callus is observed on radiographs.. In cases where reduction was not considered satisfactory weight bearing was delayed till occurrence of callus on x ray.

Further follow up was carried out at 6, 9, 12 and 16 weeks and then at two monthly intervals.

III. Results

Most of the patients were between the age group of 50-60 yrs with mean age of the patients being 54.2 yrs with a standard deviation of 9.6 yrs. Other authors like Kuokkanen (1991) [2] found the average age to be 72 years in the Basicervical fractures which he treated with various methods. Saarenpaa et al (2002) [3], Su et al (2006) [4], Boghdady et al (2007) [5], Massoud et al (2010) [6] reported the average age to be 79 years, 67.9 years, 75years(M) and 78 years(F), 68.9 years respectively. The male : female ratio being 3:1.

The time interval between trauma and surgery was average 7.5 days. The average operating time was 45min 10 sec. Enocson et al (2012) [7] found the mean operative time in these fractures treated with DHS with DRS to be 65 min.

Fracture union was found in 100% of cases and average time for union was 13 weeks. Massoud et al (2010) [6] found the average time for union to be 11.5 weeks in his cases treated with DHS and Derotation screw with no cases of non union. Enocson et al (2012) [7] found 0.02% of nonunion in his basicervical fracture cases treated with DHS and an antirotation screw. Fracture collapse of $>10\%$ was found in 20% of cases with resultant shortening. Massoud et al (2010) [6] found severe collapse in only 7.21% of his cases, rest having mild collapse.

No cases of mortality and no cases of AVN were found. There were 2 cases of superficial infection which resolved on oral antibiotic administration of Cefuroxime 500 mg B.D. and Ofloxacin 400 mg O.D and 4 cases of non specific hip pain. Enocson et al (2012) [7] in his study found 2 cases of lateral pain from the SHS plate or laterally protruding screws (2.15%) , 2 cases of deep infection(2.15%), and 1 case each of subtrochanteric fracture, post traumatic osteoarthritis and AVN (1.08% each). Yamakawa et al (2013) [8] did not found any complication in his study.

There was excellent result according to Harris hip score in 73.33% cases, good result in 16.67%, poor results were found in 10% of cases with mean Harris Hip Score being 88.5. Massoud et al (2010) [6] in their

study of basicervical fractures treatment evaluated functional results using Kyles et al modified criteria and found 92.86% excellent results,4.76% good and 2.38% fair results with no poor results.

IV. Conclusion

From this prospective study conducted on 30 patients with basicervical fracture of femoral neck, we came to the conclusions that Basicervical Fractures of Femoral Neck are unique type of fracture mid way between true neck femur fractures and intertrochanteric fractures. Maintenance of length, apposition, axial alignment and normal rotational alignment provides a satisfactory result following fractures of the proximal femur. In Basicervical fracture of neck femur DHS with Derotation Screw provide excellent results in terms of fracture union as well as functional outcome. Functional outcome is more influenced by quality of fracture reduction There was better functional outcome with good reduction of fractures..

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Photographs



Pre-Op X Ray



Post-Op X Ray



Union At 12 Weeks



Squatting At 8 Mnth Follow Up



Straight Leg Raising At 8 Mnth Follow Up