Original Research Article

Comparison of conservative and internal fixation with dynamic hip screw methods in management of intertrochanteric fractures of the femur

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Abstract

Background: Intertrochanteric fractures are the most commonly treated fractures by Orthopedic surgeon. Many techniques are described in literature but internal fixation with Dynamic Hip screw is most efficient method.

Aim: The present study was conducted to compare the results of conservative methods and internal fixation with dynamic hip screw in management of intertrochanteric fractures of the femur.

Materials and methods: This study included 40 patients of intertrochanteric fractures of the femur, out of which 30 patients were treated by conservative methods considered as Group I and 10 patients were treated by internal fixation with Dynamic Hip Screw (DHS) considered as Group II. All the results were evaluated by using Kyle's criteria.

Results: In Group I, 4 (13.3%) cases had excellent results, 6 (20%) case had good results, 20 (66.6%) cases had poor results. In Group II, 8 (80%) cases had excellent results, 6 (20%) cases had good results. In Group I, 73.3% of cases had unstable fractures and in Group II, 80% of cases had unstable fractures

Conclusion: The quality of results was better with internal fixation with dynamic hip screw (DHS) as compared to conservative methods.

Key words

Intertrochanteric fractures, Dynamic Hip Screw, Conservative management, Hip fractures.

Introduction

Hip fractures are devastating injuries that most often affect the elderly and has tremendous impact on both the health care system and society in general with life expectancy increasing each decade [1]. The incidence of hip fractures which was limited significantly in elderly is now increasing among young persons who sustain high energy trauma. Despite marked improvement in implant design, surgical techniques, and patient care. Hip fractures continue to consume a substantial proportion of our health care resources. The combination of growing elderly population and a rising incidence of high energy trauma makes a thorough understanding of hip fractures essential [2].

Gulberg [3] has predicted that the total number of hip fractures worldwide will reach 2.6 million by 2025. Hagino, et al. reported a lifetime risk of hip fracture for individuals at 50 years of age of 5.6% for men and 20.0% for women [4, 5]. The most commonly used implant is the Dynamic hip screw (DHS) with side plate. It is currently considered the gold standard for fixation of IT fractures [6].

Conservative treatment regimens include Buck traction, well leg traction, plaster Spica immobilization; Russel balanced traction and skeletal traction through distal femur or proximal tibia. Various operative treatments consist of internally fixing the fractures by various implants such as fixed nail plate devices, sliding nail plate devices and intramedullary devices [7]. The aim of present study was to compare the results of conservative methods and internal fixation with dynamic hip screw in management of intertrochanteric fractures of the femur.

Material and methods

This study was conducted in the Department of Orthopedics, M.N.R. Medical College and Hospital, Sangareddy. The patients for this study were selected from those attending the Outpatient Department of Orthopedic and from those arriving at emergency of M.N.R. Medical College and Hospital, Sangareddy from April 2013 to June 2015. The present study included 40 patients of intertrochanteric fractures of the femur, out of which 30 patients were treated by conservative methods considered as Group I and 10 patients were treated by internal fixation with Dynamic hip Screw (DHS) considered as Group II. All the patients were subjected to detailed history, clinical examination. Necessary radiological and pathological investigations were done.

Inclusion criteria

For conservative treatment

- Patients who were non ambulatory prior to fracture.
- Patients with severe anemia.
- Poor cardiovascular and pulmonary status.
- Osteoporotic patients.

For internal fixation with Dynamic Hip Screw

- Patients who were ambulatory prior to fracture.
- Patients who were in stable medical condition to tolerate the stress of surgery and anesthesia.

All patients were subjected to take detailed clinical history, examination of the injured hip, assessment of neuro vascular status of limb associated with injury, radiological examination of hip.

Implants used

DHS lag screw, Compression Screw, 1350 DHS Barral Plate, 4.5 mm cortical screws.

Evaluation of the results

The results will be evaluated and graded as excellent, good and poor as per criteria of Kyle (1979).

- **Excellent:** No pain, minimum limp, normal range of motion, can walk without support, can squat and sit cross legged, no shortening
- **Good:** Occasional mild pain, noticeable limp, acceptable range of motion, can walk with the help of cane. Can squat and sit cross-legged shortening less than two cm.
- **Poor:** Moderate pain, marked limp, limited range of motion, can't walk, can't squat and sit cross-legged, shortening more than two cm.

Results

Out of 40 cases majority of patients were males, 28 (70%) and females were only 12 (30%), sex distribution did not differ too much in both groups of patients with 66.6% males in Group I and 80% males in Group II. Overall male female ratio was 7: 3. Out of 40 patients 75% patients were treated by conservative methods and 25% were treated by internal fixation. Out of 40 cases, 32 cases were due to injury caused by fall and 8 cases were due to various accidents.

Out of 40% cases, 22 (55%) patients had fracture of right side while 18 (45%) patients had fracture of left side. In our study intertrochanteric fractures have been classified into stable and unstable fractures. Boyd and Griffin type I and type II fractures are stable fractures and type III and type IV fractures are unstable fractures (**Table - 1**). Types of traction applied were as per **Table – 2**.

Table – 1: Pattern of fracture.

Pattern of fracture	Group I		Group II		Overall	
	No. of cases	%	No. of cases	%	No. of cases	%
Stable	8	26.6	2	20	10	25
Unstable	22	73.3	8	80	30	75
Total	30	100	10	100	40	100

In Group I, all cases were immobilized for about 12-14 weeks. This long period of recumbency was responsible for most of complications seen in group I. whereas all cases in Group II were mobilized the day after surgery. Methods of immobilization were as per **Table – 3**. Complications of treatment were as per **Table – 4**.

Table – 2: Types of traction applied.

Types of traction applied	No. of cases	%
Upper tibial skeletal traction	24	80
Below knee skin traction	6	20
Total	30	100

After six months the results were evaluated and graded as excellent, good and poor as per criteria of kyle [14]. In Group I, 4 (13.3%) cases had excellent results, 6 (20%) case had good results, 20 (66.6%) cases had poor results. In Group II, 8 (80%) cases had excellent results, 6 (20%) cases had good results. There was no poor result in Group II. The details were as per **Table – 5**.

Table – 3: Methods of immobilization.

Methods of immobilization	No. of cases	%
Derotation bar	24	80
One & half hip Spica	6	20
Total	30	100

Discussion

A total 40 cases of intertrochanteric fracture of the femur divided in to two groups, Group I

treated by conservative methods and Group II treated by internal fixation with Dynamic hip screw. The ratio of women to men in our series was 3:7 while Clawson (1964) reported women to men ratio in the range of 2:1 to 8:1.

Table – 4: Complications of treatment.

Complications	Group I		Group II		Overall	
	No. of cases	%	No. of cases	%	No. of cases	%
Superficial infection	--	--	2	20	2	5.0
Deep infection	--	--	--	--	--	--
Pressure sore	10	33	--	--	10	25.0
Respiratory tract infection	6	20	--	--	6	15
Urinary tract infection	3	10	--	--	3	7.5
Deep vein thrombosis	--	--	--	--	--	--
Knee stiffness	24	80	--	--	24	60
Coxa Vara	24	80	--	--	24	60
Shortening <2 cm	6	20	2	20	8	20.0
Shortening >2 cm	24	80	--	--	--	--
Non union	--	--	--	--	--	--

Table – 5: Evaluation of final results.

Result	Group I		Group II	
	No. of cases	%	No. of cases	%
Excellent	4	13.3	8	80
Good	6	20	2	20
Poor	20	66.6	--	--
Total	30	100	10	100

Considering the mode of injury in our series, out of 40 cases, injury due to fall accounted for 32 (80%) cases and road traffic accidents accounted for 8 (20%) cases. The distribution was somewhat similar to the series of cases reported by Clawson in which injury as a result of fall, involving both direct and indirect forces accounted almost invariably in majority of cases [8].

While observing the type of fracture in our series of cases it was found that unstable fractures constituted 75% of all cases. In Group I, 73.3% of cases had unstable fractures and in Group II, 80% of cases had unstable fractures (**Table - 1**). This correlates with the finding of Jacobs, et al. that incidence of comminuted unstable intertrochanteric fractures is increasing [9].

In our series of cases, 35% of all cases were suffering from associated past illness so as to preclude internal fixation in them. In Group I, 40% of all cases were terminally ill therefore they were given conservative treatment. According to Baumgaertner M., et al, patients with terminal illness, patients with old fracture non-ambulatory patients who are comfortable with the fracture should receive conservative treatment. In Group II, two patients had mild hypertension that was controlling antihypertensive drugs [10].

Abrahamsen B, et al., claimed that trochanteric fractures treated conservatively by skin traction

or Steinmann pin skeletal traction with Hamilton Russel traction has better results than any operation and that mortality is lower [11]. However, Horowitz BG, et al., reported mortality rate of 34.6% for trochanteric fracture treated by traction and 17.5% for those treated by internal fixation [12]. Thus, we set out in our study to compare the results of conservative methods and internal fixation by DHS in an intertrochanteric fracture of femur. For this out of 40 cases of an intertrochanteric fracture of the femur in our series, 30 cases were selected to be treated by internal with DHS. (**Table – 2, Table - 3**)

Jensen, et al. demonstrated that dynamic hip screw was most suitable implant in their series of an intertrochanteric fracture of the femur treated by various internal fixation devices [13]. In our study in Group II, 10 cases were treated by internal fixation with dynamic hip screw. There were no complications in 8 (80%) cases. Only two cases (20%) developed superficial infection and shortening less than 2 cm. superficial infection was treated with appropriate antibiotics. There were no complications due to implant failure in any case. The results were evaluated and graded as excellent, good and poor as per criteria of Kyle [14] (**Table - 4**)

Excellent: No pain, minimum limp, normal range of motion, can walk without support, can squat and sit cross legged, no shortening.
Good: Occasional mild pain, noticeable limp, acceptable range of motion, can walk with the help of case, can squat and sit cross legged, shortening less than 2 cm.
Poor: Moderate pain, marked limp, limited range of motion, cant squat and sit cross legged, shortening more than 2 cm.

Using above criteria we achieved excellent results in 4 (13.4%) cases, good results in 6 (20%) cases and poor results in 20 (66.6%) cases in Group I. In Group II, we achieved excellent results in 8 (80%) cases and good results in 2 (20%) cases. There was no case with poor results in Group II. Seeing the results we could achieve by conservative methods, results were poor in 66.6% of cases while the results were 80% excellent, 20% good and nil as poor after internal fixation with DHS, therefore, if condition permits internal fixation with DHS may be a treatment of choice in an intertrochanteric fracture of the femur (**Table - 5**).

Conclusion

Upper tibial skeletal traction was applied in 80% cases and below knee skin traction in 20% cases for three to four weeks followed by application of derotation bar in 80% cases and one and half hip Spica in 20% cases for another 9-11 weeks in Group I cases. In Group II cases, internal fixation by dynamic hip screw (DHS) was done. In Group I, total duration of immobilization was 12-14 weeks which in Group II, patients were mobilized within first week of surgery. The ability to walk without support, ability to squat and sit cross legged, range of motion at hip and knee were significantly better in cases where internal fixation with dynamic hip screw (DHS) was better done. Taking the anatomical or near anatomical fracture union and restoration of the patient to his or her prefracture ambulatory status at the earliest possible and avoiding all problems of recumbency. The overall quality of results was better with internal fixation with dynamic hip screw (DHS) as compared to conservative methods.

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