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Original Research Article

A Study of Management of TrochantericFractures with Sliding Compression Hip Screw

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Abstract:

Background and Objectives: Many patients come to Department of orthopaedics with trochanteric fracture. It is one of the commonest injuries occurring in elderly age group. Though fracture unites with conservative treatment but associated with high mortalityand morbidity. So fractures stabilization with sliding compression hip screw (DHS) is a useful option to prevent morbidity and mortality.

Methods: A total of 20 patients with trochanteric fractures underwent surgery for the fracture fixation with DHS in the Department of Orthopaedics, PMCH Patna. Study duration of Twenty months. Patients were selected irrespective ofsex.

Results: Excellent results were obtained in 65% of cases, good results in 15%, fair in 10%, poor in 10%. Complications include 15% shortening, 5% implant failure, 10% infection, 5% coax vara.

Conclusion: DHS is the reliable, versatile and effective treatment for the treatment of all types of intertrochanteric fractures. It minimizes the hospital stay and reduces theeconomic burden and enhances early return to work.

Keywords: Trochanteric fractures, DHS.

Introduction

Hip fractures are among the most devastating injuries in the elderly. The impact of these injuries goes far beyond immediate clinical considerations and extends into the domains of medicine, rehabilitation, psychiatry, social works and medical economics. [1]

The incidence of fractures of the proximal femur is increasing, not unexpectedly, since the general life expectancy of the population has increased significantly during the past few decades. These fractures are associated with substantial morbidity and mortality; approximately 15% to 20% of patients die within 1 year of fracture. After 1 year, patients appear to resume their age-adjusted mortality rate. Most of the proximal femoral fractures occur in elderly individuals as a result of only moderate or minimal trauma. In younger patients these factures usually result from high-energy trauma. Classically an intertrochanteric fracture occurs along a line between the greater and lesser trochanter. The prognosis of trochanteric fractures usually unites if reduction and fixation are properly done, and although malunions may be a problem, late complications are rare.

Open reduction and internal fixation of hip fractures should be done with the aim of obtaining rigid and stable internal fixation that will permit patients to be ambulatory within ashort period. Most patients are allowed to site in a chair the day after surgery. Mobilization is advantageous in preventing pulmonary complications, venous thrombosis, pressure sores and generalized deconditioning. Protected weight, bearing may be permitted within 24 hoursafter surgery, provided the fracture is well reduced and securely and rigidly fixed with stable internal fixation. [2-4]

Great attempts to fix extra capsular fractures internally began in 1930s with modification of the smith Peterson nail, which allowed immediate fixation and early mobilization. This was further modified by McLaughlin, who used a stronger four-flanged nail with serration on the end to enable a more secure fit of the nail to the plate. An alternative to the adjustable nail plates was the fixed angle nail plate, the most successful of which was the Jewett nail plate. In mid 1960s, various osteotomies were advocated with the use of rigid devices to create a stable fracture from an unstable intertrochanteric configuration. During this same period (1960s) Clawson and Massie introduced sliding devices that allowed impaction of fracture fragments. Intramedullary devices were introduces in the middle to late 1970s, in

the form of Ender's nails, Kuntscher Y nail, the Harris Condylocephalic nail and the Gamma nail. Later studies of Ender's nail have reported high incidence of varus deformity, Knee pain caused bydistal migration of pins leading to high incidence of re-operation rate, loss of reduction, shortening and external rotation. The superior results with sliding devices which were modified by the Richards manufacturing company in the 1960s produced by Dynamic Hip Screw considered to be still the implant of choice for the treatment of intertrochanteric fractures of femur by most of theauthors. [5]

Objectives

To evaluate the effectiveness of sliding compression (Dynamic) hip screw in thetreatment of trochanteric fractures with reference to

a. Mobilization

b. Rate of fracture union (Union time)

Functional outcome

Material and Methods

The clinical material, for the present study on "management of trochanteric fracture of femur with DHS" consists of 20 cases of fresh trochanteric fractures (within three weeks) of femur admitted in Patna Medical College and Hospital Patna Bihar. Study duration of Twenty Months.

Intertrochantric and per-trochanteric fractures were included in this study and sub- trochanteric fractures were excluded. Pathological inter trochanteric fractures and isolated trochanteric fractures were not included in this study. As soon as the patient was admitted, the essential information was recorded in the proforma prepared for this study and skin or skeletal traction applied. Medical evaluation and stabilization was begun, with particular attention being given, not only to cardiac and pulmonary status, but also to skin hygiene.

All cases were done under SA. All patients were maintained on prophylactic antibiotics. The antibiotic used was Cefotaxime / Ceftrioxone. It was administered in the dose of I gm IV just prior to induction of anesthesia and continuing at 12 hourly interval for 48 hours.

Implants : The screw plate, made of stainless steel, consists of two parts.

The screw, the broad threads of which must be few, that, they, always and proximal to thefracture line; otherwise they will hinder the gliding process and The plate, which is U-shaped for bending strength; at the upper end of the plate there is acuff, fixed at an angle of 135 degrees, in which the screw glides. The junction between the cuff and the plate is so strong that bending to a greater extent or breaking are not possible.

The surgery is carried out by placing the patient supine upon the orthopaedic fracture table. An assistant holds the sound limb, while the surgeon grasps the injured limb, the hip and knees are flexed to 90 degrees, strong upward traction is then exerted upon the limb in the line of femur, while an assistant stabilizes the pelvis; while the traction is still being applied the thigh is rotated medially and the limb is then lowered to horizontal position, with medial rotation still being maintained. The reduction is confirmed with image intensifier. Each foot is bandaged firmly to the respective foot piece of the orthopaedic table. The sound limb is abducted to 30 degree to 40 degree and locked in this position. On the second post operative day suction drains are removed. Statures are removed on 8th and 10th day. Patients are then begun on a physiotherapy programme (active and active assisted exercises to hip and knee) to regain ambulatory states and mobilized on NON-WEIGHT BEARING CRUTICH WALKING and discharge from the hospital once thewound was healed. Patients are advised non weight bearing until there is roentegenographic evidence of fracture healing. The following up was done on out-patient basis up to 1 year depending on the patient.

1. Reaming, 2. Tapping, 3. Screw Fixation, 4. Barrel and Tap Screw Fixation, 5. Confirmation of fixation, 6. Wound closure.

Results

The following observation were made from the date collected during this study of 20 patients with trochanteric fractures

Age Incidence: In this series the average age of patients was 53.5 years. The youngest being 29 years and oldest being 79 years. The distribution of cases according to various agegroup are as shown below.

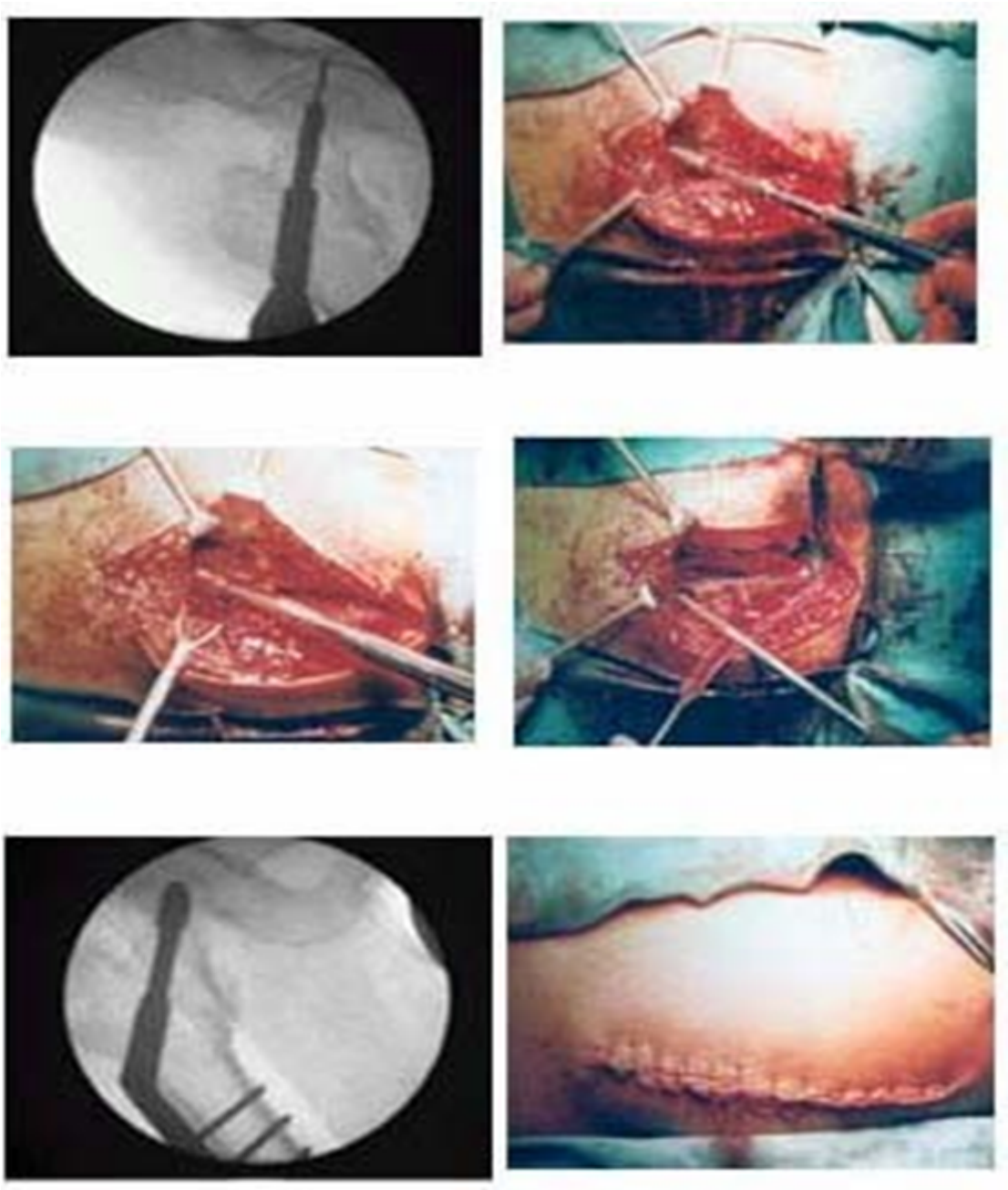

Table 1: age incidence

Age in Years	No. of cases
21 – 30	1
31 – 40	1
41 – 50	2
51 – 60	4
61 – 70	5
71 – 80	7
Total	20

In this study there were 11 men (55%) and 9 women (45%) showing malepreponderance. In this series high energy trauma (severe) secondary to road traffic accident and fall from a height was the mode of injury in 5 cases (25%) and trivial, secondaryto a missed step in 15 cases (75%).

Table 2: Type of Fracture

Type of fracture	No. of cases	Percentage
Type I	4	20
Type II	12	60
Type III	3	15
Type IV	1	5
Total	20	100

Table 3: Associated injuries

Associated injuries	No. of patients	Percentage
# Both bones (leg)	1	5
# Colle's fracture	2	10
Head injury	1	5
Total	4	20

The commonest associated disease in this study was anaemia (10 cases), the other disease included chronic obstructive pulmonary disease, hemiplegia,diabetes mellitus, hypertension, ischaemic heart disease.

Table 4: Complications

Complications	No. of cases	Percentage
Infection	2	10
Shortening	3	15
Implant failure	1	5
Coxa vara	1	5

The average days of stay in the hospital in this series was 41 days. Themaximum period was 70 days and minimum being 12 days.

Table 5: Hospital stay

Hospital stay (weeks)	No of cases	Percentage
2 – 4	5	25
4 – 6	9	45
6 – 8	3	15
8 – 10	2	10
10 – 12	1	5
Total	20	100

In this study one patient expire during follow up. He was diagnosed to haveischaemic heart disease, expired by 7 months of surgery,

Table 6: Assessment of results

Results	No. of cases	Percentage
Excellent	13	65
Good	3	15
Fair	2	10
Poor	2	10
Total	20	100

Discussion

Fractures of the trochanter are relatively common injuries among the elderly. Unfortunately, this is the single most abused fracture in the body, especially when managed surgically (Tronzo, 1973), In the recent years there is no controversy in the management of trochanteric fractures, and it has been well established that surgical management is the answer. The review of literature emphasizes theoretical, practical and biomechanicaladvantages of the dynamic hip screw over other implants. Though Medoff's axial compression screw has come into vogue, dynamic hip screw remains to be the best implant available till date, for fixation of the trochanteric fractures of the femur. In this series, involving the rural population most of them being illiterates are non- complaint and resistant to the modern methods of treatment. An effort had been made to motivate, educate and to give them the best treatment available in the management oftrochanteric fractures [6]. The results of the study are evaluated.

Age distribution: In the present series, the average age is 53.5 years. The average age is towards the lower side compared to other series. Though trochanteric fractures are known to occur in the elderly but in this series many young patients had sustained trochanteric fractures and the age group range from 28-79 years [7]. Rapid industrialization, improved

modes of transport and exposure of younger age group to road traffic accidents and fall from height, does explain the higher incidence of trochanteric fractures in younger age group (Table 1)

Table 7: Comparison of average age distribution

Series	Year	Average age (Years)
Sahlstrand	1974	75
Ecker et al.	1975	75.1
G. S. Kulkarni	1980	62
V. Chacko	1984	61.7
T.S. Sethi et al.,	1983	58.5
Watson et al.,	1998	76

Many authors have observed female preponderance in their series viz., Boyd and Griffin (1949), Evans (1955), Sermiento (1963), Ecker et al [8]., (1975) and Watson etal., (1998). Though it is believed that trochanteric fractures occur more commonly in women, because of metabolic bone changes. In this series, male preponderance has been observed. Similar incidence has been observed by Ohri and Hateem (1959), R.C. Gupta (1974), [9] v. Chacko and S.P. Mohanty (1984), K.P. Pathak (1984), Sethi et al., (1993) [10].

This observation may be because, in India males are engaged in more strenuous and active life, hence more prone to injuries. Whereas females are known to have a morecontained and restricted lifestyle. The nature of injury was trivial in 75% in older age group. The high incidence or trochanteric fracture occurring among the elderly due to fall at home following missed step. Calls upon for a safer living condition, prevention of osteoporosis and other age-related conditions, In this series the commonest associated disease was anaemia (50%) and COPD (15%). Other associated conditions were diabetes mellitus, hypertension ischemic heart disease and hemiplegia [11]. This finding calls for better health awareness. In this series, the commonest of type trochanteric fracture of Boyd and Griffin classification was Type II (65%) which is the same as observed by other authors in literature.

Incidence of osteoporosis among the elderly may be responsible for high incidence of comminution when an excessive bending strain is applied at the neck shaft angle [12]. Comminuted fractures are hence found to be most difficult to reduce, requiring open reduction and stable fixation (Sermiento, 1968; Dimon and Houghston, 1967).

Complications: In this series, shortening of less than 1 cm was seen in 3 patients

Ecker et al[2], (1975)	-	20%
Sernbo (1988)	-	20%

Shortening may be due to late collapse at the fracture site as the stresses are known tobe high at the neck shaft angle. The rate of infection in this series is 10% (two cases) both the patients had deep infection with discharging sinus for which implant had to be removed at 1 year after the fracture had consolidated. Following implant removal wound healing was good in both the patients. The high rate of infection when compared to other series maybe due to less number ofpatients included in the study. The infection rate observed by other author are as seen below

Table 8: comparison of infection rate

Authors	Year	Percentage
Jocobs et al.[3],	1976	4
Jensen[4]	1980	20
Sernbo et al.,	1988	2.5
Sethi et al[5].,	1993	8

In this series implant failure (cut out) was seen in one patient (5%), the same patient had 1.5cm shortening and coxa vara following implant failure [13]. The functional results in this series were seen to be excellent in 65%. In these patients, the hip was painless, no shortening, they were able to walk without support and returned back to work to by three months. The results were good in 3 cases (15%), fair in 2 cases (10%) and poor in 2 patient (10%) [14].

Comparison of results

Authors	Year	Excellent	Good
T. Sahlstrand	1974	72%	18%
Babhulkar	1987	59%	33%
Sernbo et al.,	1988	82%	18%
Sethi et al.,	1993	72%	18%

The functional outcome when compared to other series was found to be almostsimilar. [15]

Conclusion

DHS is the reliable, versatile and effective for the treatment of all types of intertrochanteric fractures. DHS fixation minimizes the hospital stay and reduces the economical burden and enhances early return to work. Early weight bearing does not compromise the end results, this is particularly useful inout Indian setup where most of the patents illiterate and uncooperative with post- operative restricted weight bearing as is essential with other devices.

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