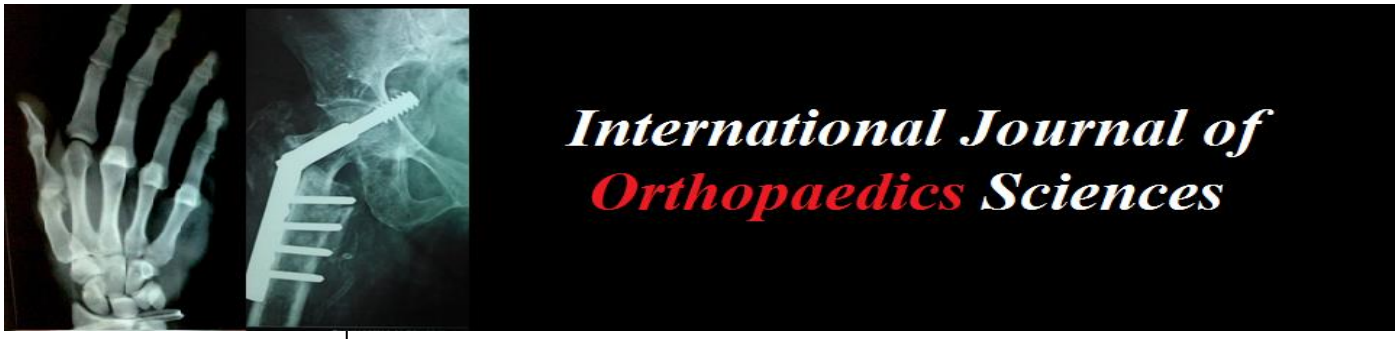

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Outcome analysis of coxo-femoral bypass for intertrochanteric fracture femur in elderly patients

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Abstract
In this study, we have tried to find and analyse the outcome of coxofemoral bypasss in intertrochanteric fractures which were operated at a tertiary care hospital in Bhopal, M.P., India and completed the follow up till 12 months. These patients were analysed on various intra-operative and post-operative parameters. Functional assessment was done using Harris Hip Score. Harris Hip Score showed that 04(20%) patients had excellent results, 08 (40%) patient had good results, 04(20%) patients had fair and 02(10%) had poor results. Poor results were seen in patients with multiple co-morbidities. This study indicates that coxofemoral bypass for intertrochanteric fractures in elderly patients has shown to achieve early rehabilitation and good long-term results.

Keywords: Intertrochanteric fractures, coxo-femoral bypass, harris hip score, hemiarthroplasty

Introduction
An increase in the incidence of intertrochanteric fractures is on the rise due to the increased life expectancy of the people and osteoporosis [1–5].The mechanism of injury is mostly trivial trauma. Bergström *et al.* [6] found that low-energy trauma (fall<1 m) caused 53% of all fractures in persons 50 years of age and older. In those over 75 years, low-energy trauma caused >80% of all fractures
Osteoporosis and instability are one of the most important factors leading to unsatisfactory results [7–9]. Also in these elderly patients with unstable osteoporotic fractures, a period of restricted mobilisation is suggested [10, 11] which may cause complications like atelectasis, bed sores, pneumonia, and deep vein thrombosis [12].
Intramedullary interlocking devices have shown reduced tendency for cut-outs in osteoporotic bones [13, 14] and also have better results in cases of unstable intertrochanteric fractures [15–19].
Endoprosthetic replacements have also been shown to achieve early rehabilitation of the patient and good long-term results [20–24].
This study analyses the result of coxo-femoral bypass in treatment of intertrochanteric fracture in the elderly and physiologically elderly patients treated by primary hemiarthroplasty.

Materials and Methods
The study was conducted after approval from ethics committee of our institute. Patients presenting with intertrochanteric fractures of greater than 60 years of age were included in the study after getting an informed consent. Patients were evaluated preoperatively by preoperative X-ray hip AP and Lateral view, preoperative and post-operative Harris Hip Score [25], preoperative and postoperative weight-bearing and whole lower extremity radiographs were obtained in all patients.
Patients with age above 60 years, comminuted intertrochanteric femur fracture (Boyd & Griffin type II/III) and patients who were independently ambulatory before sustaining the fracture were included in the study. Patients with age less than 60 years, non-ambulatory patients before surgery and patients with pathological fractures were excluded from the study.
20 patients meeting the inclusion and exclusion criteria were admitted between July 2018 to September 2020. These patients were operated under spinal anaesthesia. Thorough scrubbing, painting and draping were done.

There were two approaches with which the patients were operated namely, 1. Antero-lateral approach or 2. Posterior approach.

Appropriate sized prosthesis was inserted. All surgeries were done by experienced surgeons.

Patients were mobilized with full weight bearing with the assistance of physiotherapists on the second postoperative day, and check dressings were done, suction drains were removed after 48 hours. Functional outcome was assessed post operatively at 2 weeks, 3 months, 6 months and 12 months.

Table 1: Distribution of cases according to age

S. No	Age Groups (years)	Frequency	Percentage
1	60-70	16	80.0
2	71-80	3	15.0
3	>80	1	5.0
4	Total	20	100.0

Table 2: Distribution according to gender

S. No.	Sex	No. of Cases	Percentage
1	Male	16	80.0
2	Female	4	20.0
3	Total	20	100.0

Table 3: Distribution according to Boyd & Griffin's Classification

S. No.	Boyd and griffin Type	No. of Cases	Percentage
1	II	19	95.0
2	III	1	5.0
3	Total	20	100.0

Table 4: Harris hip score

S. No.	Outcome	Number of Patients	Percentage
1	Died	2	10.0
2	Excellent(90-100)	4	20.0
3	Good(80-90)	8	40.0
4	Fair(70-80)	4	20.0
5	Poor(<70)	2	10.0
6	Total	20	100.0

Table 5: Complications

S. No.	Complications	No. of Cases	Percentage
1	Abductor weakness	3	75
2	Superficial infection	1	25
3	Total	4	100.0

Results

In this study we observe that most cases of intertrochanteric fractures occurred in age group of 60-70 years (Table 1).Male preponderance is seen in this study as out of 20 patients, 5 were females and 15 were males (Table 2).19 patients (95%) had Boyd & Griffin Type II and 1 patient (5%) had Boyd & Griffin Type III fractures. (Table 3)

The functional results were graded according to Harris Hip Scoring System. In this study,04 patients had excellent results,08 patients had good results,04 patients had fair results,02 cases had poor result.Thus,80% cases had excellent to fair results as assessed by Harris hip score.(Table 4)(Figure 3) Out of 20 patients,03 developed adductor weakness and 01 developed superficial infection. No patient had posterior dislocation and wound dehiscence in follow ups. (Table 5)

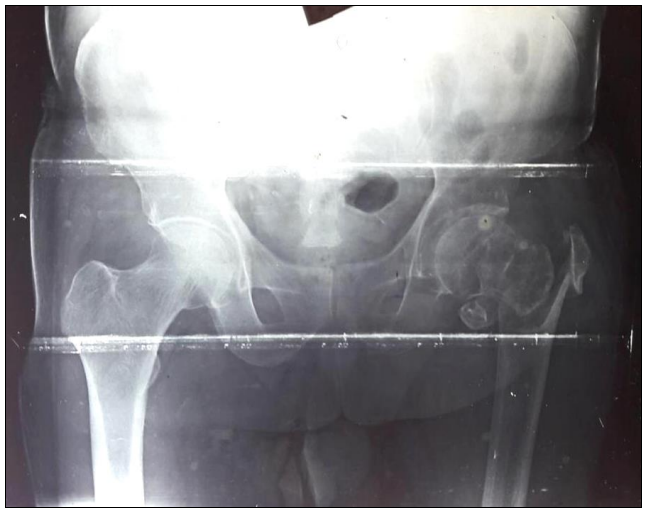

Fig 1: Pre-op X-ray

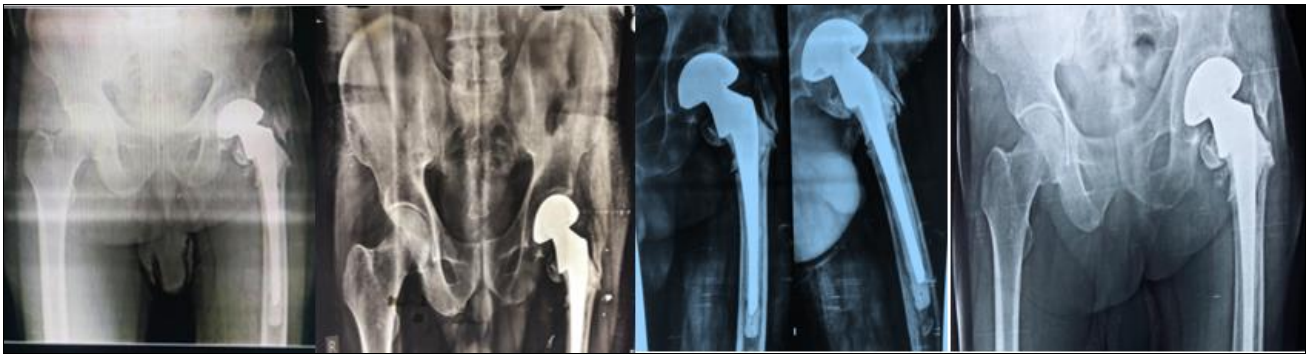

Fig 2: Post op X-rays showing progress of a case over 12 months

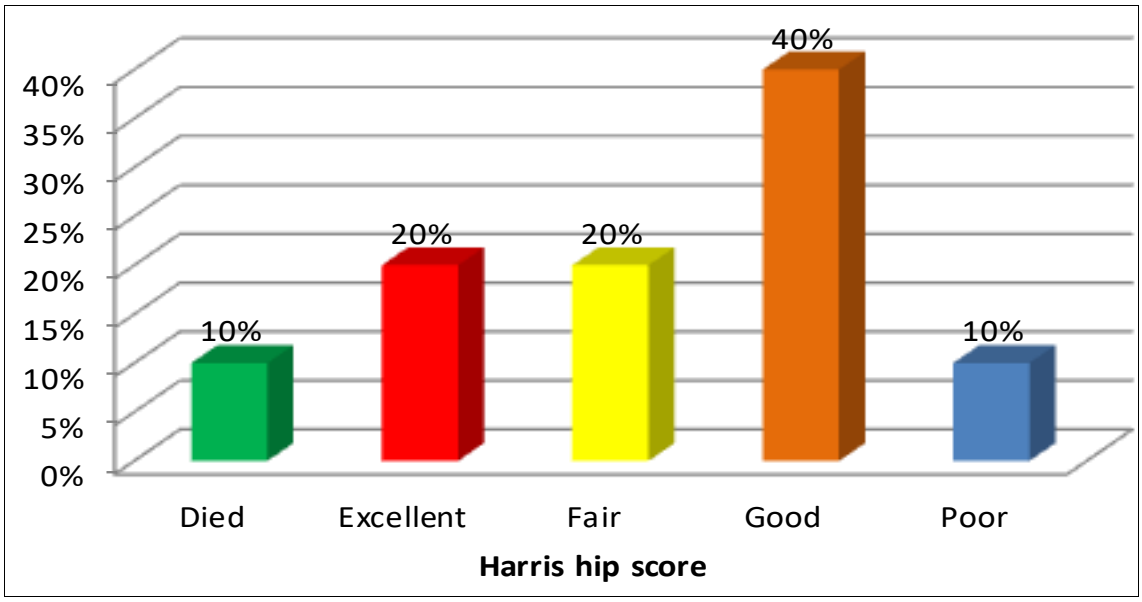

Fig 3: Graph showing Harris hip score

Discussion

Osteosynthesis with various implant (DHS/PFN) has been the treatment of choice for intertrochanteric fracture. However, the scenario is different when comes to the management of unstable fractures especially in geriatric population.

Early weight bearing following internal fixation of intertrochanteric fractures in elderly and osteoporotic patients leads to fixation failure and poor results which requires further surgical intervention and revision of surgery. Initially hemiarthroplasty was used only in the treatment of failed fixation of intertrochanteric fractures, but now hemiarthroplasty is a frequently employed as an alternative for stability and allows early mobilization with full weight bearing. Most of the complications associated with internal fixation can be avoided with the use of prosthetic replacement.

This is mainly due to inadequate purchase of screw in osteoporotic bone and inability of the elderly patient to follow partial weight bearing protocol following fixation, who invariably land up in full weight bearing. This leads to excessive collapse at the fracture site with migration of femoral head into varus and retroversion which results in shortening and decreased abductor lever arm causing limping amongst the patients. Another complication is screw cut out from femoral head.

Newer implants like "proximal femoral nail" combines the features of a sliding hip screw (SHS) and intramedullary nail. It limits the amount of fracture collapse, compared with an SHS. This implant is most effective in intertrochanteric fractures with subtrochanteric extension and in reverse obliquity fractures. It has been associated with an increased risk of femur fracture at the nail tip or distal locking screw insertion point. Use of this implant in unstable trochanteric fractures management has been encouraging, however long-term outcome of these devices are yet to be defined.

Tronzo [26] was the first surgeon to use long- stem. Matchett Brown Endoprosthesis for the primary treatment of intertrochanteric fractures. Following this many other surgeons also reported good results with the use of various prosthesis. Pho *et al*. [27] achieved good results with use of Thompson prosthesis.

1987 Green *et al*. [28] performed bipolar prosthetic replacement for 20 elderly patients with intertrochanteric fractures to promote early full weight bearing and rapid rehabilitation. In this study**,** we did hemiarthroplasty in all 20 cases with similar results.

Conclusion

All the patients considered in our study were above 60 years of age with most of patients of 60 to 70 years of age.

The functional outcome was evaluated using Harris hip score.04 (20%) patients had excellent results, 08 (40%) patient had good results, 04(20%) patients had fair and 02(10%) had poor results. Poor results were seen in patients with multiple co-morbidities.03 patients developed adductor weakness and 01 patient developed superficial infection.

This procedure offered excellent pain free mobile hip, with early mobilisation, easy rehabilitation and early return to functional level. Coxo-femoral bypass reduced the complications of prolonged immobilisation, prolonged rehabilitation, marked residual deformities and need for revision surgeries. The procedure offered faster mobilization, rapid return to pre- injury level, improved the quality of life and gave a long term solution in elderly patients with intertrochanteric fractures of the femur.

Further comparative studies are required to assess the improvement scores of the above procedure and the procedures mentioned in the literature.

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All authors contributed to the study concept and design. Material preparation, data collection and analysis was performed by Dr. Manoj Kumar, Dr. Mohit Asthana, Dr. Vijendra Parmar and Dr. Abhishek Pathak. The first draft of the manuscript was written by Dr. Mohit Asthana and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript. There was no conflict of interest.

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