

Management of Intertrochanteric Fractures with Cemented Bipolar Arthroplasty: A Prospective Study

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Abstract

Background and Aim: A successful hip operation should result in a stable, pain-free hip with a wide range of motion. However, none of the approved treatments for intertrochanteric fractures has been able to fully meet this objective. The study's goal was to examine how cemented bipolar arthroplasty might be used to treat older individuals with unstable intertrochanteric fractures.

Material and Methods: The current study was carried out over a period of two years in the Department of Orthopedics at the tertiary care teaching institute in India on senior patients with intertrochanteric fractures treated by cemented Bipolar hemiarthroplasty. A total of 40 patients were chosen for the trial, including 16 men and 24 women. The fractures were categorised using a method developed by Boyd & Griffin. At the conclusion of the trial, the functional result of each patient was evaluated using the Harris hip score. (HHS).

Results: In the current study, cemented bipolar arthroplasty was used to treat 40 patients with intertrochanteric femur fractures. The following observations were made after a follow-up using the Harris Hip Score. 60% of patients reported no pain at all. Six patients (15%) experienced minor pain, while six (15%) experienced mild pain. Four individuals (10%) reported moderate pain. Out of 40 patients, 12 had Harris hip scores of excellent, 12 of good, 10 of fair, and 6 had Harris hip scores of poor. Harris hip score on average was 81.25. 70% of individuals had no complications at all. Six of them had knee stiffness, four had an infection of the skin just above the surgical site, and two had foot drop as a post-operative consequence.

Conclusion: The morbidity associated with prolonged bed rest, such as pressure sores, lung infections, and atelectasis, is significantly reduced in older patients with unstable intertrochanteric fractures treated with cemented bipolar arthroplasty. Early mobilisation, generally consistent pain management, and a return to almost normal daily activities are all undeniable benefits.

Keywords: Bipolar Arthroplasty, Harris Hip Score, Intertrochanteric Fractures, Pain.

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Introduction

One of the most frequent hip fractures is an intertrochanteric fracture, especially in older people with osteoporosis. It frequently happens as a result of low-energy trauma, including mild falls. The prevalence of intertrochanteric fracture is increasing as the number of elderly people with osteoporosis increases [1]. The incidence is predicted to double by 2040. The number may be much higher in India. Due to postmenopausal osteoporosis, females are more likely than males to sustain trochanteric fractures [2].

The major therapeutic goals are a secure fixation and an immediate full-weight-bearing mobilisation. For stable intertrochanteric fractures, osteosynthesis is an easy and efficient treatment; however, addressing unstable intertrochanteric fractures is challenging because of poor bone quality, osteoporosis, and other underlying diseases [3,4].

Because to urbanization's increased sedentary lifestyle and longer life expectancy, the prevalence of these fractures has grown. While IT fractures most frequently result from minor trauma in the elderly population, high velocity trauma causes them in younger populations. Because of osteoporosis, intertrochanteric fractures occur more frequently in women than in men. 50-year-olds had a lifetime risk of hip fracture of 5.6% for men and 20% for women [5,6].

Since ancient times, numerous therapy techniques have been used. Nonetheless, the issue is still a mystery that hasn't been resolved [1]. Long-term immobilisation in the elderly puts the patient's life in danger and makes the situation more difficult. In order to obtain a bone union, one is compelled to completely relinquish complete immobility. Instead, one must resort to early ambulatory operations like DHS, IMN with SHS, and hemireplacement arthroplasty to reach a reasonable level of function.

Intramedullary interlocking devices have improved outcomes in situations of unstable intertrochanteric fractures and have exhibited a decreased tendency for cut-outs in osteoporotic bones. Nonetheless, it is still unclear what function intramedullary devices serve in unstable intertrochanteric fractures. Consequently, in the instance of intertrochanteric fractures, fracture stability, bone strength, and early rehabilitation determined the outcome. It is common knowledge that the hip is a weight-bearing joint and serves a variety of purposes [7,8].

A good hip operation should result in a stable, pain-free hip with a wide range of motion. However, none of the approved treatments for intertrochanteric fractures has been able to fully meet this objective [9,10]. In many cases, the patient must also endure numerous surgeries and a protracted rehabilitation process in order to keep his original joint. Determining the role of cemented bipolar arthroplasty in older patients with unstable intertrochanteric fractures was the study's primary objective.

Materials and Methods

The current study was carried out over a period of two years in the Department of Orthopedics at the tertiary care teaching institute in India on senior patients with intertrochanteric fractures treated by cemented Bipolar hemiarthroplasty. The prospective study is the type of investigation.

Inclusion criteria

1. Intertrochanteric femur fractures of Boyd & Griffin types 2, 3, and 4 in patients older than 65 years.
2. A previous fixation that failed.
 - The patient must be younger than 65 years old.
 - Dementia patients who are immobile and medically unfit.
 - people suffering with mental illnesses.

- Intertrochanteric fracture of type I, Boyd and Griffin.

Sample size: 40 cases are selected for the study.

The patient's overall condition was evaluated upon admission. According to a predesigned and pretested proforma, a thorough clinical examination was conducted. This included a detailed history on the patient's age, sex, occupation, mechanism of injury, length of recovery, prior and associated medical conditions, and pre-injury morbid state.

Due to implant cutting, a DHS fixation for an intertrochanteric fracture failed in two patients. An antero-posterior view X-ray of the fractured leg was taken upon admission. The fractures were categorised using a method developed by Boyd & Griffin. 24 individuals, or the majority, suffered type II intertrochanteric fractures. There were 4 type IV individuals and 10 type III patients. There were two patients who had previously had implant failure.

To determine whether there were any more related injuries, all patients underwent clinical and radiological evaluations. Just 14 of the 40 patients experienced injuries in addition to their intertrochanteric fracture. On the first day of admission, two patients received EDH surgery for head injuries. Eight patients had abrasions elsewhere on their bodies, four patients had distal radius fractures that were treated conservatively, and 26 patients had no other injuries. On admission, all patients underwent routine tests like a haemogram, blood sugar analysis, urea, creatinine, serum electrolytes, chest X-ray, ECG, BT, and CT. Twenty patients had no co-morbid illnesses, such as DM, HT, IHD, or COPD. The remaining 20 patients each had one or more concomitant diseases. All patients were evaluated for their medical suitability for anaesthesia and surgery before being accepted for surgery. Of 40 patients, 20 stayed for fewer than 10 days, and 16

stayed for between 10 and 20 days prior to surgery. Four patients stayed more than 20 days in order to manage comorbid conditions before the surgery.

A thorough clinical examination was conducted systematically at the follow-up. Patients were assessed for pain, limp, use of a support, walking distance, ability to ascend stairs, ability to put on shoes and socks (in our study, this criteria was assessed by ability to cut toenail), sitting on chair, ability to use public transportation, deformities, leg length discrepancy, and movements in accordance with the Harris hip scoring system.

The follow-up chart contained a record of all the information. At each follow-up, a radiograph of the hip that had surgery was taken. At the conclusion of the trial, the functional result of each patient was evaluated using the Harris hip score (HHS). In our investigation, the minimum and maximum follow-up periods were also nine months. For follow-up, each of the 40 patients visited again.

Harris hip scoring system;

The functional outcome was graded as following depending on the Harris hip score.

1. Excellent 90-100
2. Good 89-80
3. Fair 79-70
4. Poor <70

Results

In the current study, cemented bipolar arthroplasty was used to treat 40 patients with intertrochanteric femur fractures. A total of 40 patients were chosen for the trial, including 16 men and 24 women. The average age was 73.6 years. There were more patients (35%) in the 71–75 year age group. Males on average were 73.83 years old, and females on average were 71.93 years old. Fall while walking in 16, due to fall from staircase in 6, low velocity motor vehicle accident in

14, and assault in 2 patients. Follow up was done using harris hip score and following observations were made. 60% of patients didn't have any kind of pain. Slight pain in 6 patients (15%) and mild pain in 6 patients (15%) were observed. Moderate pain was observed in 4 patients (10%). 12 (30%) of the 40 patients walked normally without limping. During follow-up, 24 of them (or 60%) displayed a mild limp. At the conclusion of the trial, 4 individuals (10%) exhibited mild limping. Of the 40 patients, 12 (30%) were able to walk unaided. For lengthy walks, 18 of them (45%) used canes. Four of the patients (10%) walked mostly with a cane. Six patients (15%) utilised a crutch to help them walk. Ten of the 40 patients had used a

cane to walk before their injury. Even after surgery, those 10 individuals remained to use a cane.

Of of 40 patients, 12 displayed exceptional range of motion, 18 displayed good range of motion, and 6 displayed medium range of motion.

Out of 40 patients, 12 had Harris hip scores of excellent, 12 of good, 10 of fair, and 6 had Harris hip scores of poor. Harris hip score on average was 81.25. 70% of individuals had no complications at all. Six of them had knee stiffness, four had an infection of the skin just above the surgical site, and two had foot drop as a post-operative consequence.

Table 1: Distribution of patients according to their Harris hip score

Harris hip score	Score	No. o patients	Percent
Excellent	90 - 100	12	30
Good	89-80	12	30
Fair	79-70	10	25
Poor	<70	6	15
Total		40	100

Discussion

A prospective study was done on management of unstable intertrochanteric fractures in elderly patients using cemented bipolar arthroplasty. The study was conducted among 38 elderly patients who had Boyd & Griffin's type II, III & IV intertrochanteric fractures and 2 patient of failed fixation admitted in Govt. Medical College hospital, for the duration of 2 years.

Several studies were conducted to demonstrate the superiority of cemented bipolar arthroplasty over alternative techniques. The current study has demonstrated successful outcomes in the management of patients with cemented bipolar arthroplasty. older patients undergoing surgery: Most of the patients in the current study (60%) were older than 70 years of age. Their average age was 73.6 years.

According to this, in a report published in Springer link journal of international orthopaedics 46, the mean age of the 54 senior patients who underwent surgery was 75.6. (64-91). According to numerous studies, bipolar arthroplasty reduces mortality and morbidity when treating older patients with an intertrochanteric fracture. An investigation conducted in China in 2006 by Yin Q, Jiang Y *et al* [11]. (2008) revealed 89 cases of comminuted intertrochanteric fractures treated with bipolar prostheses, with an average age of 82.6 years. Similar to this study, Green, Stuard M.D [12]. *et al.* (1984) treated 40 elderly patients with an unstable intertrochanteric fracture with a bipolar head-neck replacement and reported excellent postoperative outcomes..

According to Boyd and Griffin's categorization, intertrochanteric fractures

were categorized in the current study. 24 type II, 10 type III, 4 type IV, and 2 old implant failures were recorded. The bulk of the fractures in this study were type II fractures, which was consistent with what many other writers had seen in the literature. Boyd and Griffin's categorization system was used in the current investigation to categories intertrochanteric fractures.

A total of 24 type II, 10 type III, 4 type IV, and 2 old implant failures were reported. The bulk of the fractures in this study were type II fractures, which was the same as what many other writers in the literature had noticed. The degree of comminution is determined by the bone's condition; it is more common in elderly people whose bones are osteoporotic.

Rodop *et al* [13], in a study of primary bipolar prosthesis for unstable intertrochanteric fractures in 37 elderly patients obtained 17 excellent (45%) and 14 good (37%) results according to the harriship scoring system. In a study by sancheti *et al.* a total of 25 out of 35 had a good to excellent (71%) results. Similarly in an article given in Springer link journal of international orthopedics (2004) 46 among 54 elderly patients on whom surgery was done, Harris hip score was excellent in 17% and good in 14% of cases.

Similar results were found in the study by Yin Q *et al* [11], (2008), which involved 85 points overall and a Harris hip score of 84% (excellent in 16% of cases, good in 56% of cases, fair in 12% of cases, and bad in 16%). 79 unstable intertrochanteric or subtrochanteric fractures were treated for in a series of 100 patients, 75 years of age or older, with either a cemented bipolar arthroplasty (91 patients) or total hip arthroplasty (9 patients). 78% of patients reported good to excellent results [14].

In our research of 40 patients, 12 patients (30%) had Harris Hip scores of excellent (90-100) or good (89-80). Only 6 patients (15%)

had a low Harris hip score, while 10 patients (25%) had a fair (79-70) Harris hip score.

The average Harris Hip score was 81.25. It demonstrates the successful functional results of cemented bipolar arthroplasty in our study's elderly patients with intertrochanteric fractures.

Conclusion

The morbidity associated with prolonged bed rest, such as pressure sores, lung infections, and atelectasis, is significantly reduced in older patients with unstable intertrochanteric fractures treated with cemented bipolar arthroplasty. Early mobilisation, generally consistent pain management, and a return to almost normal daily activities are all undeniable benefits.

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