



Outcomes of Partial Hip Replacement as Primary Treatment for Hip Fractures in the Elderly: A Case Series

Armand Bryan D Sutingco*, Arlan H Troncillo, Jose Rodrigo G Cervero and Ramon B Gustilo

Dr. Ramon B. Gustilo Hospital, Manapla, Negros Occidental, Philippines

***Corresponding Author:** Armand Bryan D Sutingco, Dr. Ramon B. Gustilo Hospital, Manapla, Negros Occidental, Philippines.

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Abstract

The hip replacement is usually viewed as a salvage procedure for failed fixation treatment in addressing hip fractures. In this case series, the researchers looked into partial hip replacement surgery as a primary treatment in dealing with hip fractures. 61 patients that suffered a hip fracture, 30 femoral neck fractures, and 31 intertrochanteric fractures, were diagnosed through standard radiographs and were managed with partial hip replacement at the hospital. The results showed that partial hip replacement as a primary treatment for hip fractures, both femoral neck, and intertrochanteric fractures, show promising results in terms of shortened hospital length of stay and decreased mortality rates.

Keywords: Femoral Neck Fractures; Intertrochanteric Fractures; Partial Hip Replacement

Introduction

Hip fractures are comprised of Femoral neck fractures and Intertrochanteric fractures. About 300,000 cases are said to occur in the United States alone each year, 50% of which involved the femoral neck. Of this 50%, 8 out of 10 individuals are women. And this incidence doubles every 5 to 6 years in a woman's life once they reach the age of 30 years old. Femoral neck fractures have a bimodal incidence. The younger patient population has lower case numbers but is associated with high energy trauma. The majority of the cases occur in the elderly population, ages 72 and above, and usually suffered a low energy fall. The risk factors for sustaining a femoral neck fracture include female sex, white race, increasing age, poor health, tobacco and alcohol use, previous fracture, fall history, and low estrogen level. The treatment for femoral neck fractures ranges from conservative non-surgical treatment, multiple screw fixation, to partial hip or total hip replacement.

On the other hand, Intertrochanteric fractures account for the other 50% of hip fractures. Approximately 150,000 cases are seen annually in the United States. The epidemiology of it ranges from 2:1 to 8:1, women to men. This is usually attributed due to post-menopausal metabolic changes in the bone. The other factors associated with intertrochanteric rather than femoral neck fractures include advancing age, increased number of comorbidities, increased dependency in activities of daily living, and a history of other fragility fractures. The treatment for intertrochanteric fractures ranges from conservative non-surgical management, compression hip screw fixation, proximal femoral nailing, to partial hip or total hip replacement [1,2].

Hip replacement surgery is usually viewed as a salvage procedure for failed fixation treatment in addressing hip fractures. In this case series, the researchers present partial hip replacement as a primary treatment for treating hip fractures.

Methodology

This is a case series study done in a Level 1 general hospital (Dr. Ramon B. Gustilo Hospital) in Manapla, Negros Occidental. The study consists of 61 patients that suffered hip fractures diagnosed through radiographs and were managed with partial hip replacement. The patients were analyzed through the following outcome measures: Length of Stay, Mortality Rate, and Functionality. Patients were enrolled into the study retrospectively.

Results

From 2017 up to the present, there have been 61 patients that suffered a hip fracture, 30 femoral neck fractures, and 31 intertrochanteric fractures, were diagnosed through standard radiographs and were managed with partial hip replacement at the hospital.

The demographics of the population are as follows: 51% of the cases were femoral neck fractures and the other 49% were intertrochanteric fractures. 85% of the which were females, 15% were males. The average age of the patients was 82 years old. The youngest patient in the population was 68 years old, while the oldest patient treated was 96 years old.

All patients were admitted 1 day before their surgery, cleared Cardio-Pulmonary wise, and treated using the Modular Endoprosthesis Partial Hip System by Orthopaedic Internationale Inc. All patients were also referred to physical therapy for gait retraining and were sent home able to ambulate, with full weight bearing on the operated lower extremity.

Discussion

Hip fractures are amongst the most common cases orthopedic surgeons encounter [4]. In treating these fractures, one is challenged as to how to bring the fracture fragments back in an anatomic position or at least in an acceptable reduction and maintain fixation [3].

In addition, osteoporosis complicates things as it predisposes one to have implant failure or hardware cutouts [4]. This was confirmed in a study done by Bonnaire, *et al.* which talked about a minimum level of 0.06 g/cm³ bone density that predisposes implant cut out in intertrochanteric fractures in osteoporotic patients [5]. This is where arthroplasty comes in. Joint replacement surgery eliminates the risk of implants cutting out through the porous bone due to poor purchase of the hardware [6]. This would, later on, translate to a faster and better recovery for patients.

In this paper, the researchers looked at the following outcomes to monitor the recovery of hip fracture patients treated with hip replacement in contrast to patients treated with Open Reduction Internal Fixation (ORIF): length of hospital stay, mortality rate, and functionality.

Length of stay

In a systematic review by Ju, *et al.* on hip fractures, the paper looked at 1067 unstable intertrochanteric fractures aged 65 and above. The researchers noted that the average hospital length of stay for hip fractures treated with intramedullary nails is 16 days [7]. In another paper written by Yoo, *et al.* on femoral neck fractures. The average length of stay for patients that underwent ORIF for femoral neck fractures ranges between 11-20 days [8]. Meanwhile, in DRBGH, the average stay for intertrochanteric hip fractures treated with partial hip replacement was 6.9 days, the longest staying patient was 14 days while the shortest was 2 days. Meanwhile, for the femoral neck fractures, the average length of stay was 4.7 days. The longest stay was noted to be 8 days, while the shortest was 2 days as well.

Mortality rate

With regards to the mortality rate, an analytical study done by Mattison, *et al.* looked at patients that suffered intertrochanteric and subtrochanteric fractures. The researchers found 10,548 cases that were treated with proximal femoral nails or compression hip screws and saw that the overall 30-day mortality was around 7.7% and 1-year mortality of 26% [9]. In addition, a paper by Kurtinaitis, *et al.* looked at the mortality rates of patients that suffered femoral neck fractures. The paper noted 736 cases of femoral neck fracture treated with internal fixation versus hip replacement. Results showed that the mortality rate of the internal fixation group was 36.8% in contrast to 28% of the hip arthroplasty group. The overall 1-year mortality rate was documented at 32.6% while the 2-year mortality rate was noted at 42.9% [10]. In DRBGH, the mortality rate for the intertrochanteric fracture group was reported to be at 3.6% at 3 months and 6 months post-op, and 10.7% at 1-year post hip replacement surgery. Furthermore, the femoral neck fracture group showed a mortality rate of 4.2% at 3 months and 6 months post-op, and 8.3% 1-year post hip replacement surgery. The causes of death for the patient are as follows: pneumonia, gastrointestinal bleed, pulmonary embolism, and cancer.

Functionality

In terms of functionality, 100% of all post partial hip replacement cases were ambulating with full weightbearing, postoperatively. For

the intertrochanteric fracture group, 11% of the cases ambulation without any assistance, 21% were cane ambulators and 68% used walkers. Meanwhile, for the femoral neck fracture group, 4% ambulate without any assist, 38% are cane ambulators, and 58% use walkers for assist.

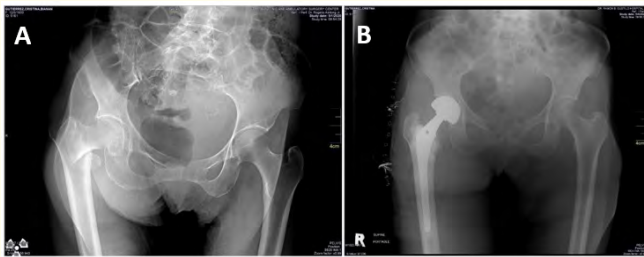


Figure 1. This is the case of GSB, an 88-year-old, female that was diagnosed with an intertrochanteric fracture of the right hip. (A) Pelvis AP injury film, showing discontinuation of the cortices at the intertrochanteric area, and superior displacement of the distal fragment of the proximal femur. (B) Pelvis AP x-ray showing partial hip replacement using the modular endoprosthesis as treatment of the intertrochanteric fracture of the right lower extremity.

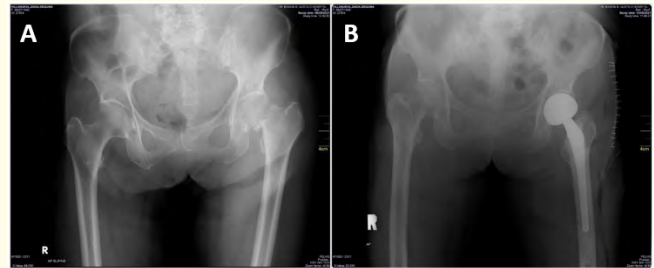


Figure 2: This is the case of VZD, a 79-year-old, female who suffered a femoral neck fracture of the left hip. (A) Pelvis AP injury film, Pelvis AP injury film, showing discontinuation of the cortices at the femoral neck area, and superior displacement of the distal fragment of the proximal femur (B) Pelvis AP x-ray showing partial hip replacement using the modular endoprosthesis as treatment of the femoral neck fracture of the left lower extremity.

	Initials	Age	Sex	Date of Surgery	Diagnosis	Procedure Done	Status	Length of stay	Ambulatory Status
1	LCG	68	F	27/02/2017	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Alive	3	Cane
2	ELK	76	F	10/06/2017	Fracture closed complete displaced femoral neck right	Partial Hip Replacement Right	Deceased	5	NA
3	AMA	80	F	25/11/2017	Fracture closed complete displaced femoral neck right	Partial Hip Replacement Right	Deceased	4	NA
4	PAC	82	F	02/03/2018	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Lost to follow up	5	Walker
5	NCN	82	M	02/07/2018	Fracture closed complete displaced femoral neck right	Partial Hip Replacement Right	Lost to follow up	3	Walker
6	ARR	82	M	11/10/2018	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Deceased	8	NA

7	VGP	80	F	31/01/2019	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Lost to follow up	7	Walker
8	REE	91	F	08/11/2019	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Alive	6	Walker
9	RLM	84	F	16/06/2020	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Lost to follow up	3	Walker
10	GLB	84	F	27/06/2020	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Alive	6	Cane
11	TEU	73	F	21/07/2020	Fracture closed complete displaced femoral neck right	Partial Hip Replacement Right	Alive	3	Cane
12	DLM	78	F	08/08/2020	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Lost to follow up	6	Walker
13	MJD	86	F	27/10/2020	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Lost to follow up	6	Walker
14	CEA	77	F	03/12/2020	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Alive	2	Walker
15	MSS	74	F	07/12/2020	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Alive	3	Cane
16	AMP	69	F	23/01/2021	Fracture closed complete displaced femoral neck right	Partial Hip Replacement Right	Alive	4	Cane
17	JSE	81	F	28/01/2021	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Alive	7	Cane
18	DDZ	72	F	03/02/2021	Fracture closed complete displaced femoral neck right	Partial Hip Replacement Right	Alive	4	None
19	LJO	91	F	20/02/2021	Fracture closed complete displaced femoral neck right	Partial Hip Replacement Right	Alive	6	Walker
20	BLL	79	F	25/06/2021	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Alive	5	Walker
21	DNA	74	F	11/06/2021	Fracture closed complete displaced femoral neck right	Partial Hip Replacement Right	Alive	4	Cane

22	BND	78	F	07/06/2021	Fracture closed complete displaced femoral neck left; Fracture closed complete displaced distal radius left	Partial Hip Replacement Left, Application of Cobra External Fixator Wrist Left	Alive	5	Cane
23	OPS	73	F	14/01/2021	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Alive	4	Walker
24	NAV	80	F	09/01/2021	Pathologic fracture femoral neck right	Partial Hip Replacement Right	Alive	7	Cane
25	VZD	79	F	15/09/2021	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Alive	5	Cane
26	PMV	85	F	17/09/2021	Fracture closed complete displaced femoral neck right	Partial Hip Replacement Right	Alive	4	Walker
27	AJB	65	M	27/09/2021	Fracture closed complete displaced femoral neck right	Partial Hip Replacement Right with Cerclage Wiring	Alive	6	Walker
28	TAE	67	F	05/10/2021	Fracture closed complete displaced femoral neck left	Partial Hip Replacement Left	Alive	4	Walker
29	MLB	65	F	09/08/2021	Fracture closed complete displaced femoral neck right	Partial Hip Replacement Right	Alive	4	Walker
30	AMO	64	F	14/08/2021	Fracture closed complete displaced femoral neck right	Partial Hip Replacement Right	Alive	4	Walker

Table 1: Femoral Neck Fracture Cases.

	Initials	Age	Sex	Date of Surgery	Diagnosis	Procedure Done	Status	Length of Stay	Ambulatory Status
1	BCJ	86	F	20/01/2017	Fracture closed complete displaced intertrochanteric area femur right	Partial Hip Replacement, Right	Deceased	14	NA
2	PAY	78	F	20/02/2017	Fracture closed complete displaced intertrochanteric area femur right	Partial Hip Replacement, Right	Alive	5	one

3	JCC	76	F	13/06/2017	Fracture closed complete displaced intertrochanteric area, Left; Fracture closed complete displaced intra articular supracondylar distal femur, right	Partial Hip Replacement, left ; Open reduction distal femur, right	Alive	2	Walker
4	CMB	90	F	21/06/2017	Fracture closed complete displaced intertrochanteric area femur right	Partial Hip Replacement, Right	Deceased	4	NA
5	BPP	81	F	26/06/2017	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Alive	4	Walker
6	ITL	79	M	07/05/2019	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Deceased	9	Walker
7	AMC	96	F	21/08/2018	Fracture closed complete displaced intertrochanteric area femur left; Fracture closed complete displaced transcondylar humerus left	Partial Hip Replacement, Left and OR-plating distal humerus, left	Alive	6	Walker
8	BNL	72	F	15/02/2020	Fracture closed complete displaced intertrochanteric area femur right	Partial Hip Replacement, Right	Alive	3	none
9	GCB	87	F	04/05/2020	Fracture closed complete displaced intertrochanteric area femur right	Partial Hip Replacement, Right	Alive	7	Walker
10	GID	77	M	19/05/2020	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Alive	7	Walker

11	BFD	82	F	16/05/2020	Fracture closed complete displaced intertrochanteric area femur right	Partial Hip Replacement, Right	Alive	8	Cane
12	FVD	91	F	21/05/2020	Fracture, closed complete, displaced intertrochanteric area left hip; Lipoma right foot	Partial hip Replacement Left; Excision of Mass Foot Right	Alive	10	Walker
13	GJN	79	F	03/07/2020	Fracture closed complete displaced intertrochanteric area femur right	Partial Hip Replacement, Right	Alive	6	Walker
14	NO	80	F	05/08/2020	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Alive	9	Walker
15	NLV	85	F	11/08/2020	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Alive	8	Walker
16	HNS	86	M	01/10/2020	Fracture closed complete displaced intertrochanteric area femur right	Partial Hip Replacement, Right	Deceased	14	NA
17	CJD	88	F	14/11/2020	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Alive	5	Walker
18	ARM	91	F	15/12/2020	Fracture closed complete displaced intertrochanteric area femur right	Partial Hip Replacement, Right	Alive	7	Cane
19	MCG	71	F	27/12/2020	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Deceased	7	NA
20	DMA	85	F	21/01/2021	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Alive	4	Cane
21	LCA	84	F	05/06/2021	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Alive	4	Walker

22	GEE	74	M	06/07/2021	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Alive	5	Cane
23	MCE	90	F	29/04/2021	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Alive	10	Walker
24	VEB	81	F	25/06/2021	Fracture closed complete displaced subtrochanteric area femur left	Partial Hip Replacement, Left	Alive	5	Walker
25	VEM	80	F	5/20/2021	Fracture, closed, complete, intertrochanteric with subtrochanteric extension, left proximal femur	Partial Hip Arthroplasty, Left and Closed Reduction, Percutaneous Pinning, Left Proximal Humerus	Alive	6	Walker
26	VND	85	F	7/6/2021	Fracture closed complete displaced intertrochanteric area femur right	Partial Hip Replacement, Right	Alive	6	Walker
27	JHP	76	F	12/1/2020	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Deceased	5	NA
28	GAA	69	M	7/14/2021	Fracture closed complete displaced intertrochanteric area femur right	Partial Hip Replacement, Right with cerclage wiring	Alive	13	Cane
29	MLE	77	F	7/15/2021	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Alive	10	Walker
30	FLF	64	M	9/9/2021	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Alive	6	Walker
31	CEB	80	F	10/1/2021	Fracture closed complete displaced intertrochanteric area femur left	Partial Hip Replacement, Left	Alive	5	Cane

Table 2: Intertrochanteric Fracture Cases.

Conclusion and Recommendations

Partial hip replacement as a primary treatment for hip fractures, both femoral neck, and intertrochanteric fractures, show promising results in terms of shortened hospital length of stay and decreased mortality rates.

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