

Measurement of Harris Hip Scoring During Early post-operative Period in Intertrochanteric Fractures Femur Treated with Dynamic Hip Screw

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Abstract

Objectives: Intertrochanteric fractures of femur are difficult fractures to reconstruct because of strong biomechanical forces leading to failure of many an implant designs in the past. After failure of many designs Dynamic Hip Screw (DHS) has stood the test of time. We have prospectively studied the functional recovery of these fractures in 60 patients for 24 weeks using Harris Hip scores. Harris hip score was used to measure the outcome.

Material and Methods: It was a descriptive case series done between 15th March 2022 to 14th January 2023 in Department of Orthopedics Surgery, Avicenna Hospital, Lahore. Sixty patients of intertrochanteric fractures within 2 weeks of injury of age ≥ 50 years were inducted in a descriptive study and Harris Hip Score was used to study the rehabilitation during 6 months after surgery. Patients with other fractures of same limb or multiple fractures, BMI >35.0 kg/m², or diabetic (BSR >200 mg/dl), patients with pre-existing symptomatic acetabular diseases, patient with previous stroke, hemiparesis or other neuromuscular disorder likely to interfere with uneventful rehabilitation were excluded. Patients were followed-up in OPD after 12, 20 and 24 weeks of surgery. On each visit biplane X-rays were made, patient was interviewed and Harris hip score was calculated. In the end according to Harris hip score, functional outcome was categorized as excellent, good, fair and poor outcomes.

Results: Out of these 60 patients, 20 (33.33%) were male and 40 (66.67%) were female. Mean age was 61.40 ± 5.97 years. Mean duration of fracture was 8.05 ± 2.51 months. In our study, functional outcome was excellent in 63.33%, good in 26.67%, fair in 5.0% and poor in 5.0% cases. Mean Harris hip score was 88.40 ± 7.91 .

Conclusion: Harris hip score can be used to assess rehabilitation of patients treated with DHS for intertrochanteric fractures in early post operative period.

Keywords: Intertrochanteric Fractures femur, Dynamic Hip Screw, Harris Hips Score.

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Introduction

Though reliable data for Pakistan is not available we do get intertrochanteric fractures every week in our departments. It is an everyday procedure that every orthopedic unit operates. Approximately

252,000 hip fractures occur each year in the United States. A stable and acceptably fixed intertrochanteric fracture can be expected to heal uneventfully. In elderly patients, the mobility level usually drops by one level after recovery from this injury. It has been seen that those walking without support may need to use a cane or those using a cane previously may need a walker or crutches later. The mortality is 20-80% during the first year after fracture for these patients. Hip fractures cause high morbidity in the elderly and are a major public health concern worldwide.¹ In our set up this burden is borne by the family. Approximately 50% of fractures in elderly people are

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unstable intertrochanteric fractures of hip. Different studies have reported highest occurrence of hip fracture in older patients. Incidence of these fractures rises dramatically with increasing age.² In a Pakistani study by Adeel K et al in a recent publication (2020), it was revealed that the mean Harris hip score was 81.83±23.01, while functional outcome was excellent in 73.5%, good in 2.9%, fair in 0% and poor in 23.5% cases.^{3-5,7} While another study by Mue D et al reported that the mean Harris hip score was 17±1 after 24 weeks of using dynamic hip screw for hip fracture and functional outcome was excellent in 65.4%, good in 15.4%, and fair in 11.5%.⁵⁻⁷ It is common knowledge that our rehabilitation service & physiotherapy backup is not uniformly available to all patients along with lack of domiciliary care. Overall, patients managed with plate fixation had slightly less pain and deformity than those managed with intramedullary nailing, and no significant differences were identified with regards to function or patient satisfaction. In addition, the authors found that patients managed with intramedullary nailing had more procedure-related complications, particularly femoral shaft fracture. Present study was done to document level of functional rehabilitation of the patient with intertrochanteric fracture proximal femur treated with DHS, by using an internationally accepted method i.e Harris Hip Score. This study was planned to obtain the local data that can be analyzed in our setting for management of hip fractures in future and improve patient's outcome.

Material and Methods

It was a descriptive case series done between 15th March 2022 to 14th January 2023 in Department of Orthopedics Surgery, Avicenna Hospital, Lahore. A sample size of 60 cases was calculated with 95% confidence level, d=0.30 and magnitude of mean Harris hip score i.e. 17±1 with dynamic hip screw for hip fractures. All subjects were included through a non-probability, consecutive sampling. All those patients of age 50 years and above, either gender with the diagnoses of Intertrochanteric fracture within 2 weeks of injury. Those excluded had fracture of same limb or multiple fractures BMI >35.0kg/m², or diabetic (BSR >200 mg/dl), acetabular diseases, previous stroke, hemiparesis or other neuromuscular disorder likely to interfere with uneventful rehabilitation patient substance abuse or mental retardation. All patients were operated using a DHS

for internal fixation under image guidance. All patients were followed up in OPD at 2 weekly intervals in 1st month and later at monthly intervals. Harris hip scores were calculated at 12, 20 and 24 weeks of surgery. An earlier observations was not done as most patients at this stage do not show equal ability to walk. The data retrieved was analyzed with SPSS 20 segregating the hips fractures into stable or unstable configuration. Permission from IRB Avicenna Medical College Hospital was sought and all patients were operated after informed consent by the same surgeon.

Results

On tabulation of the data mean age was 61.40 ± 5.97 years. Trauma was the reason in 35(58.33%) and with-out history of falls in 25(41.67%). Out of these 60 patients, 20 (33.33%) were male and 40 (66.67%) were females with male to female ratio of 1:2. Thirty nine were stable in configuration (65.0%) and 21(35.0%)

Table 1: Functional outcome of patient fixed with DHS screw (n=60)

Functional outcome	No. of Patients	%age
Excellent	38	63.33
Good	16	26.67
Fair	03	5.0
Poor	03	5.0

Table 2: Stratification of Harris hip score with respect to age, gender, duration of fracture, cause, and type of fracture, stability and ASA (American Society of Anesthesiologists).

		Mean	SD	P-value
Age (years)	50-70	88.94	7.45	0.145
	>70	84.29	10.58	
Gender	Male	87.30	8.19	0.451
	Female	88.95	7.82	
Duration (days)	≤7	88.53	8.87	0.897
	>7	88.27	6.97	
Cause	Traumatic	89.23	8.53	0.341
	Non-traumatic	87.24	6.96	
Type	I	85.70	2.63	0.520
	II	87.89	10.44	
	III	90.0	6.25	
	IV	90.67	1.97	
Stability	Stable	90.10	7.38	0.022
	Unstable	85.24	8.06	
ASA status	I	86.0	8.12	0.046
	II	90.11	7.40	

Table 3: Stratification of functional outcome with respect to age, gender, duration of fracture, cause, and type of fracture, stability and ASA (American Society of Anesthesiologists).

		Excellent	Good	Fair	Poor	P-value
Age (years)	50-70	36 (67.92%)	12 (22.64%)	03 (5.66%)	02 (3.77%)	0.109
	>70	02 (28.57%)	04 (57.14%)	00 (0.0%)	01 (14.29%)	
Gender	Male	13 (65.0%)	04 (20.0%)	02 (10.0%)	01 (5.0%)	0.569
	Female	25 (62.50%)	12 (30.0%)	01 (2.50%)	02 (5.0%)	
Duration (days)	≤7	22 (73.33%)	04 (13.33%)	02 (6.67%)	02 (6.67%)	0.132
	>7	16 (53.33%)	12 (40.0%)	01 (3.33%)	01 (3.33%)	
Cause	Traumatic	28 (80.0%)	02 (5.71%)	03 (8.57%)	02 (5.71%)	0.0002
	Non-traumatic	10 (40.0%)	14 (56.0%)	00 (0.0%)	01 (4.0%)	
Type	I	01 (10.0%)	09 (90.0%)	00 (0.0%)	00 (0.0%)	0.0003
	II	21 (77.78%)	01 (3.70%)	02 (7.41%)	03 (11.11%)	
	III	11 (64.71%)	05 (29.41%)	01 (5.88%)	00 (0.0%)	
	IV	05 (83.33%)	01 (16.67%)	00 (0.0%)	00 (0.0%)	
Stability	Stable	32 (82.05%)	05 (12.82%)	00 (0.0%)	02 (5.13%)	0.0002
	Unstable	06 (28.57%)	11 (52.38%)	03 (14.29%)	01 (4.76%)	
ASA status	I	10 (40.0%)	13 (52.0%)	00 (0.0%)	02 (8.0%)	0.0007
	II	28 (80.0%)	03 (8.57%)	03 (8.57%)	01 (2.86%)	

were unstable. Mean duration of fracture was 8.05 ± 2.51 months. In our study, functional outcome was excellent in 63.33%, good in 26.67%, fair in 5.0% and poor in 5.0% cases as per. Mean Harris hip score was 88.40 ± 7.91 .

Discussion

Proximal femoral nail anti-rotation (PFNA) and Dynamic hip screw (DHS) fixation are both frequently used to treat intertrochanteric femoral fractures (IFFs).^{9,12,11} Results of IFFS treatments in Chinese publications for cases between 2010 to 2015 have shown lower complication rates than fixation with implants other than DHS^{12,13}. A low Harris Hip Score and cut through of the implant from femoral head is seen in mostly in elderly and osteoporotic patients.¹⁴ Many RCTs published to date have failed to prove superiority of one of the devices over the other in short-term functional and radiographic outcomes.^{15,16} Similar is the enigma regarding treatment of type 31-A1 IFFs (two part fractures) among elderly patients with osteoporosis. We have conducted this study to determine the functional outcome of patient using Harris Hip Score with intertrochanteric fracture fixed with dynamic hip screw. Mean age was 61.40 ± 5.97 years as shown in Table I. Our interest was to document the return to preoperative functional status of the subjects operated. First calculation of Harris Hip Score was done at 12 weeks when the patient had already been

mobilized. Out of these 60 patients, 20 (33.33%) were male and 40 (66.67%) were females with male to female ratio of 1:2. In our study, functional outcome was excellent in 63.33%, good in 26.67%, fair in 5.0% and poor in 5.0% cases. Mean Harris hip score was 88.40 ± 7.91 . Generally hip fracture patients tend to stop coming to out patients clinics once they are mobile and independent. Pakistani society is lucky to have a family system that looks after the old parents thus no domiciliary care system has developed as yet because either the parents live with their married children or the children may still be living in the parents house. Most local studies have achieved very good results for the treatment of hip fractures in the elderly but return to preinjury status has not been probed as an outcome. Most reports are anecdotal or unscientific observations. Out of many a criteria available we choose HHS. Harris Hip Score is a very standard scoring method used to evaluate the functional status of the patient based upon the interview of the patient as per a standardized proforma. It tries to understand the presence or absence of deformity, pain, ability to perform daily chores and self-care. It has been accepted by most by now but it has mostly been in use to study hip arthroplasty results. As the joint is the same and activities in both intracapsular and extracapsular fractures both are the same we have attempted to use the same yardstick to study functional recovery in

DHS cases. People who have tried to evaluate hip scoring systems in detail have failed to make a consensus statement in the end and have avoided to selected one system over the 16 others currently in use world over.^{10,13,16} Umeili GL et al in their exhaustive review have concluded that an ideal scoring system should be both patient and physician centered; which Harris Hips Scoring system is not.¹⁰ Patient reported functional recovery is generally given more value than radiological measurements of union when it comes to assessment of an implant for fracture treatment. Harris hip score though used earlier on in evaluating arthroplasty cases has shown promise as a patient-reported outcome measure (PROMs) in such cases. Many workers have modified the HHS to MHHS removing the clinical examination part by the physician thus reducing time consumed in filling the proforma. They conclude that the reliability and usage does not change with the modification.¹¹ In a Pakistani study by Adeel K et al in a recent publication (2020), it was revealed that the mean Harris hip score was 81.83±23.01, while functional outcome was excellent in 73.5%, good in 2.9%, fair in 0% and poor in 23.5% cases.⁷ While another study reported that the mean Harris hip score was 17±1 after 24 weeks of using dynamic hip screw for hip fracture and functional outcome was excellent in 65.4%, good in 15.4%, and fair in 11.5%: reconfirming the practical applications of HHS.^{7,10} There are many more studies which have achieved similar results like us. In another local study,² the mean age was 65.49±7 years. Male patients were 170(60.71%) and female 110(39.28%). Excellent outcome was documented in 151(53.92%), good in 90(32.14%), fair in 22(7.85%) and poor in 17(6.07%) with HHS score of 93.3±5, 88.7±7, 77.3±4 and 33.1±9 respectively. Chandu G and et al in 2021 found that with the use of dynamic hip screw, the mean Harris hip score was 36.21±5.078 after 4 weeks, 53.67±5.836 after 12 weeks while 71.48±6.934 after 24 weeks of surgery. The functional outcome was encouraging when scored using Harris hip score was 62.5% (good), 10.4% (fair) and 27.1% (poor). Gupta et.al and Kushal et al in their studies have also produced results similar to our findings. Another study reported that after 24 weeks, the mean Harris hip score was 58.95 after using dynamic hip screw for hip fracture.⁵ Similarly, Shetty et al. and Barwar et al. also reported good functional and radiological outcomes of DHS

fixation of unstable intertrochanteric fractures with excellent to a good outcome in most. Our patients have shown clear superiority of early functional recovery of the DHS when used in fixation of intertrochanteric fractures of femur. Although our study is over a very small group of patients and the follow up period is very short but the results merit further work on the subject so that solid recommendations can be based upon the findings thus obtained.

Conclusion

It can be presumed that patients of intertrochanteric fractures operated with internal fixation device dynamic hip screw get a good functional outcome when assessed with Harris Hip Score. We opine that Harris Hip Score shows promise as a surrogate measure of patient reported functional recovery in such cases.

Conflict of interest

None

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None

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Authors Contribution

- MUK, FNH:** Conceptualization of Project
MUK, OKF, FNH: Data Collection
MUK, AK, FNH: Literature Search
MUK, TA, FNH: Statistical Analysis
MUK, WA, FNH: Drafting, Revision
MUK, FNH, OKF, AK, TA, WA: Writing of Manuscript