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Comparison of Harris Hip Score functional outcome proximal femur fracture fixation with open reduction internal fixation (ORIF) and hemiarthroplasty

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Abstract : Objective : The aim of this study was to compare the outcomes of proximal femur fractures treated with open reduction internal fixation (ORIF) and hemiathroplasty in trauma patients.
Material And Methods : A total of forty three trauma patients with proximal femur fractures treated surgically between January 2015 and March 2017 were included into the study type of fracture according to Association for Osteosynthesis/Association for the Study of Internal Fixation (AO/ASIF) classification; types of surgical procedure (ORIF or hemiarthroplasty), gender, age and follow-up scores six months prior to surgery (Harris Hip Score [HHS]) were recorded.
Results : The preoperative characteristics of the patients in ORIF twenty-one (21) and hemiarthroplasty twenty-two (22) with total of forty-three (43) subject, female twenty-three (22) and male twenty (20). There were significant differences with regard to the HHS at the six months prior to surgery (p>0,05) with HHS score of the ORIF group (76,67 ±1,68), hemiarthroplasty group (81,91 ±1,90).
Conclusion : Although ORIF had satisfactory outcomes in surgically treated patients with proximalfemur fractures, we recommend proximal femur fractures with hemiarthroplasty; which is can give better clinical outcomes.
Key words : Hemiarthroplasty; proximal femur fracture; Harris Hip Score; open reduction internal fixation.

Introduction

The incidence of hip fractures is rising due to increasing life expectancy in the elderly population. Also, mortality after femur proximal femur fracture is increasing with a 1-year mortality rate of 14 to 36%.[1,2]One of the major problems with these fractures is patients' return to their preoperative period level of activity and independence in carrying out daily routines.[3] 50% of these patients require assistance in their daily living activities, and 25% need to receive long-term care after treatment.[4]

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Many treatment methods have been used for treating traumatic proximal femur fractures, including open reduction internal fixation (ORIF) and hemiarthroplasty. However, it is difficult to achieve and maintain a stable fixation especially in elderly patient. Early mobilization and prompt return to prefracture activity levels are the maingoals of surgery. The treatment of this fracture remains a challenge to the surgeon, and there is still controversy about the ideal treatment modality of hip fractures in elderly patients.

Therefore, the present study was undertaken to compare outcomes of reduction of proximal femur fractures using internal fixation and hemiarthroplastyin trauma patients.

Methods

This cross sectional study was conducted at Medical Faculty of North Sumatera University / Haji Adam Malik Hospital, North Sumatera, Indonesia for the duration 1 month from October 2017 by collecting HHS from patients who underwent ORIF and hemiarthroplasty surgery from January 2015 until March 2017.43 subjects who had met the inclusion criteria.

Patients were called back for a last follow-up, 21 patients from the ORIF group and 22 patients from the hemiarthroplasty group admitted to the clinic for the last follow-up. Clinical evaluation was made using Harris hip scoring system (HHS), which considers pain, walking capacity and physical examination findings.

The relation between ORIF group and hemiarthroplasty group were analysed using unpaired T-test. All statistical calculation were performed using computer based statistic programme. The study approved by the Health Research Ethical Committee of Medical Faculty of North Sumatera University / Haji Adam Malik Hospital and an Informed consent was obtained from all subjects.

Results

The study included 43 proximal femur fracture patients, female 23 (53,5%); male 20 (46,5%) with the age mean 60,77 ±15,75, with 21 pqtients from the ORIF group and 22 patients from the hemiarthroplasty group.

Table 1. Subject distribution

Variabel	**Total**
Female, n(%)	23 (53,5%)
Male, n(%)	20 (46,5%)
Youngest subject	26
Oldest subject	85
Age Mean	60,77 ±15,75

Table 2. Patients gender correlated with ORIF and hemiarthroplasty group

Variabel	**Sugery**					**Total**
	HA(n=22)		**ORIF (n=21)**			
	Bipolar (n=9)	**AMP (n=13)**	**PFLP (n=7)**	**DHS (n=13)**	**IM (n=1)**	**(n=43)**
Female, n(%)	7 (77,7)	10 (76,9)	1 (14,3)	5 (38,4)	0 (0)	23 (53,4)
Male, n(%)	2 (22,3)	3 (23,1)	6 (85,7)	8 (61,6)	1(100)	20 (46,6)

HA, Hemi Arthroplasty; **ORIF,** Open Reduction Internal Fixation; **AMP,** Austin Moore Prosthesis; **PFLP,** Proximal Femur Locking Plate; **IM,** Intra Medullary; **n,** subject total

Table 3. Statistic analysis HHS between ORIF and Hemiarthroplasty group

		Mean	p value
Harris Hip Score	**ORIF**	76,67 ±1,68	0,0001
	Hemiarthroplasty	81,91 ±1,90	

Statistic analysis with unpaired T-testshows there is significant relationship between the HHS outcome in hemiarthroplasty (P<0,05) with the mean HHS for hemiarthroplasty group 81,91 ±1,90 and 76,67 ±1,68 for ORIF group.

Discussion

The main purpose of this study was to evaluate the relationship HHS outcome between the ORIF and hemiarthroplasty group. The results of this study showed that hemiarthroplasty have a good HHS clinical outcome than the ORIF group. This result have a different result with the studies by GökayGörmeliand colleagues, that showed an insignificant HHS outcome between proximal femur nailing (PFN) group and bipolar hemiarthroplasty BPH, their studies showedgood treatment methods with similar satisfactory postoperative functional results (Gormeli et al 2012).

The Cochrane review group has noted 28.6% pseudoarthrosis and 8.3% avascular necrosis with intracapsular femur fractures treated with internal fixation.[5] The choice of treatment methods in this study can be discussed. Studies have concluded that cementless hemiarthroplasty is preferred over cemented hemiarthroplasty because of reduced operation time and intra-operative blood loss and lower perioperative mortality rate.[6,7] For the ideal internal fixation method, a meta-analysis performed by Zhang et al. has concluded that PFN may be a better choice than DHS in the treatment of intertrochanteric fractures.[8] In a study of one hundred consecutive patients treated with PFN, Korkmaz et al. have concluded that PFN is a reliable fixation method for proximal femur fractures.[9] In an another meta-analysis of randomized controlled trials, Huang et al. have concluded that PFN fixations shows the same effectiveness as DHS fixation.[10]

In our study, there were statistically differences between the two groups.

Conclusion

Both ORIF and hemiarthroplasty appear to produce satisfactory outcomes in surgically treated proximal femur fractures but the HHS functional outcomes is better on the hemiarthroplasty group. Both groups are associated with their own complications, but although internal fixation had higher reoperation rates, less surgery related trauma and lower mortality rates are main advantages. Therefore, the clinician should choose the ideal method for each individual patient.

More study is needed to evaluate further between the two groups, and long term evaluation is needed to compare the long term HHS functional outcomes.

Conflict of Interest

Non declared conflict of interest relevant to this article was reported.

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