ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
Index Copernicus Value: 68 . 16
PubMed - National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 5, Issue – 1, January - 2020, Page No. : 157 - 159

To study the HHS assessment of reconstruction in total hip arthroplasty post acetabulumm fracture

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Citation this Article: Manish Sharma , Ramesh Kumar Sen , Sameer Aggarwal, Mahesh Prakash , "To study the HHS assessment of reconstruction in total hip arthroplasty post acetabulumm fracture ", ijmsir- January - 2020, Vol – 5, Issue - 1, P. No. 157 – 159.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: In our country, due to the complexity of acetabular fracture reduction surgery and expertise to manage, many of these patients are left as such and most of these neglected acetabular fractures soon end up in developing post traumatic osteoarthrosis of hip joint consequently needing THA later.

Methods: The study was carried as a retrospective study, from February 2013 to July 2014. After getting the approval from the Ethics Committee of the Institute (Annexure I) and the consent from the patients the study was conducted on 49 patients who underwent Total Hip Arthroplasty after fracture acetabulum.

Results: There was no significant difference in HHS on the basis of indication for THA after acetabular fracture. HHS does not differ significantly among the acceptable and satisfactory LLD groups.

Conclusion: No significant difference in HHS after THA in patients who received operative or non-operative treatment for fracture acetabulum.

Keywords: Radiological, Arthroplasty, Reconstruction

Introduction

In our country, due to the complexity of acetabular fracture reduction surgery and expertise to manage, many of these patients are left as such and most of these neglected acetabular fractures soon end up in developing post traumatic osteoarthrosis of hip joint consequently needing THA later[1].

The principle of reconstruction of acetabulum during total hip arthroplasty after fracture acetabulum is to repair the bony defect in the acetabulum, create a correct articulation surface and restore the centre of rotation of hip to as close to normal as possible, necessary for maintaining the hip biomechanics[2]. Good outcome in THA depends upon the quality of reconstruction and recreating the normal biomechanics of hip. There are several issues in performing THA in patients with post acetabular fractures. The quality of hip arthroplasty is likely to be affected by poorly reduced fragments, insufficient bone stock, retained implants from the previous surgery, impaired musculature, heterotopic calcification and sometimes due to the presence of residual infection[3-5].

Materials and Methods

Patient Selection

The study was carried as a retrospective study, from February 2013 to July 2014. After getting the approval from the Ethics Committee of the Institute (Annexure I)

and the consent from the patients the study was conducted on 49 patients who underwent Total Hip Arthroplasty after fracture acetabulum.

Inclusion Criteria

Patients who had undergone total hip arthroplasty in the past 7 years following fracture of the acetabulum, by a single surgeon.

Exclusion Criteria

1. Debilitating medical or surgical illness or generalized illness or co morbidities leading to restriction of physical activities.
2. Any associated foot, ankle, knee injury or disease likely to affect the overall functional outcome.
3. Associated spine injury.
4. Any neurological or psychiatric ailments interfering with the assessment of general health of the case.
5. THA done more than 7 years ago.

GROUPS

Patients were divided into

1. Four groups based on the diagnosis.
2. Two groups on the basis of treatment received after fracture acetabulum
3. Three groups based on the indication of THA
4. Two groups based on the surgical intervention.

Detailed history of the patients was taken for the aetiology of the primary disease. All the patients included in the study underwent complete clinical and radiological evaluation.

Results

A total of 49 patients with 49 hips with Total hip Arthroplasty were followed as per the predefined inclusion and exclusion. All the patients were included in the study after informed consent. The patients were recruited through the outpatient department of orthopaedics, PGIMER. An independent observer, other than the surgeon who operated, evaluated all these patients at the follow up. The patients were divided into various groups depending on the type of fracture, the indication for the THA and the type hip replacement done.

HHS Based on The Treatment Of Fracture Acetabulum

At the follow up after THA, we also evaluated HHS for the patients depending on whether they received operative or non-operative treatment following the fracture acetabulum. The HHS in patients who underwent THA after operative treatment following fracture acetabulum had excellent outcome whereas the patients who were managed non-operatively had good outcome.

Treatment	N	Mean	Std. Deviation	Minimum	Maximum	p-value
Non Operative	18	85.9444	14.88573	58.00	100.00	0.246
Operative	31	90.4516	12.02175	64.00	100.00	

*Statistically there was no significant difference in HHS after THA in patients who received operative or non-operative treatment for fracture acetabulum.

HHS Based on the Indication for THA

At the follow up after THA, we also evaluated SHHS for the patients depending on the indication for THA following the fracture acetabulum. The HHS was comparable in the three groups. We achieved the best HHS scores in the group where acetabular defects were present.

Indication For THR	N	Mean	Std. Deviation	Minimum	Maximum	p-value
Post traumatic AVN	16	88.1250	13.05310	58.00	100.00	0.849
Acetabular defect	17	89.7059	13.97661	64.00	100.00	
Post traumatic OA	16	88.5000	13.24135	59.00	100.00	

*Statistically there was no significant difference in HHS on the basis of indication for THA after acetabular fracture.

At the follow up after THA, we also evaluated SHHS for the patients depending on the surgical intervention (THA) following the fracture acetabulum. The HHS among the cases where acetabular reconstruction was done during THA was comparable to the cases where THA was done without reconstruction. We could achieve slightly better HHS in the acetabular reconstruction group.

NPar Tests

Surgical Procedure	N	Mean	Std. Deviation	Minimum	Maximum
Acet Recon	17	89.7059	13.97661	64.00	100.00
Others	32	88.3125	12.93517	58.00	100.00

*Statistically there was no significant difference in HHS, whether acetabular reconstruction was done during THA or not.

HHS Based on LLD

On evaluation of limb length discrepancy in 47 patients, 42 patients had difference in the limb length

	LLD mm	N	Mean	SD	Min.	Max.	p-value
HHS	< 10 mm	42	88.7143	13.12842	58.00	100.00	0.915
	11-20 mm	5	86.8000	16.70928	64.00	100.00	

*Statistically the HHS does not differ significantly among the acceptable and satisfactory LLD groups.

Conclusion

No significant difference in HHS after THA in patients who received operative or non-operative treatment for fracture acetabulum.

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