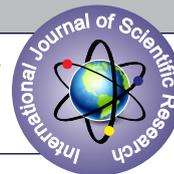


ROLE OF ACETABULAR INVOLVEMENT IN THE FUNCTIONAL OUTCOME OF TOTAL HIP REPLACEMENT- A SHORT - TERM, RETROSPECTIVE EVALUATION BETWEEN AVASCULAR NECROSIS OF HIP AND ACETABULUM FRACTURE SEQUELAE



Orthopaedics

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ABSTRACT

Background: Avascular necrosis of femoral head (AVN) and post-traumatic sequelae are very common indications for total hip replacement (THR). While AVN involves the femoral head, sparing the acetabulum, post traumatic sequelae includes pathology in the acetabulum.

Research question: Whether or not the integrity of acetabulum is a factor in the final outcome of the hip replacement surgery?

Materials and methods: The present study includes 50 AVN hips and 32 post acetabulum fractures who underwent THR in our institute. They were assessed for functional outcome using standard Harris hip score (HHS) and their quality of life was assessed using short musculoskeletal functional assessment (SMFA) and SF-36 scores.

Results: The mean HHS in AVN hips was 87.04 and in acetabulum fractures, it was 84.25 with no statistically significant difference between the two ($p=0.9$). Both the quality of life scores did not yield any statistically significant difference between the two groups either ($p>.05$).

Conclusion: Acetabular pathology does not play a significant role in the final outcome after total hip replacement.

KEYWORDS:

total hip replacement, arthroplasty, avascular necrosis (AVN), acetabulum fractures

INTRODUCTION

Total hip replacement (THR), from the times of Sir John Charnley is one of the most successful and cost-effective surgical procedures for a multitude of hip pathologies achieving long-term pain relief and functional restoration.(1) The common indications for THR, in India are arthritis due to atraumatic avascular necrosis of hip (AVN) and traumatic sequelae among others.(2,3) While the former involves the femoral head exclusively, the latter includes acetabulum fractures and their sequelae. Whether or not the status and integrity of acetabulum is a factor in the ultimate functional outcome is a question that has not been investigated. The objective of this retrospective study was to study if the integrity of the acetabular wall affected the functional outcomes of THR in AVN and post-traumatic sequelae secondary to acetabulum fractures.

MATERIALS & METHODS

This study was conducted at the Postgraduate Institute of Medical Education & Research (PGIMER) in Chandigarh, India. Patients aged between 34-78 years, who underwent THR during a period of 7 years from June 2006 to May 2013 constituted the study group of this retrospective cohort study. A total of 82 hips were evaluated out of which 50 were AVN hips in 36 patients (group 1) while the remaining 32 patients had osteoarthritis secondary to acetabulum fractures which were managed initially with primary fixation (group 2). Revision THRs were excluded from the study. All cases were operated by a single surgeon. Standard Harris hip score was used to evaluate the functional outcome; while the quality of life was assessed using validated scoring techniques like SMFA and SF-36.(4,5)

STATISTICAL ANALYSIS

Normally distributed data were analyzed with student's t-test whereas non-parametric data was analyzed using Kruskal-Wallis test. Correlation was established using Pearson's Correlation coefficient. P value <0.05 was considered statistically significant.

RESULTS

The mean age in group 1 was 39.32 years while in group 2 it was 46.08

years. The male to female ratio in AVN cases was 3.2:1 with only 12 female cases, while in the traumatic group it was 7:1 with only 4 females. (Table 1) Average follow-up of the groups was 1.8 years and 1.6 years respectively (ranging from a minimum follow up of 6 months to a maximum follow up of 3 years). The mean HHS in the two groups was 87.04 and 84.25 respectively. Both the groups had a good functional outcome and there was no statistical difference found between the two groups ($p=0.9$). (Tables 2)

The mean Short musculoskeletal functional assessment scores (SMFA) in the 2 groups were 11.51 and 13.02 respectively with no significant difference statistically. (Tables 3, 4) Since SMFA was <20 , both the groups had a good quality of life. The SF-36 scores did not show any significant difference between the groups with p-values more than 0.05. There was also a strong correlation between functional outcome and the quality of life achieved in these patients.

DISCUSSION

Both avascular necrosis of femoral head and post-acetabulum fracture sequelae are common indications for which total hip replacement is done in India. Pachore et al observed that AVN is the most common indication for THR in India.(2) Post-traumatic sequelae also is a very common indication for THR perhaps due to the lack of traffic sense, poor condition of roads and not wearing seat belts, could explain the findings of the above study.(6) Males form the majority of THR cases according to Indian studies. (2,7) In the present study also males dominate the cohorts. In India, males are much more common victims of road traffic accidents than their female counterparts. The conventional trend of males in families earning a livelihood and travelling for work, and females being home makers, make the former more susceptible to trauma. AVN has a very high etiological relation with alcohol intake and smoking. In India, due to various social factors, it is the male population that consumes alcohol and smokes, much more than females. This probably explains the high sex ratio discrepancy in our study results.

Secondary THR for post-acetabulum fracture sequelae is a technical

challenge with distorted anatomy, fibrosis, more bleeding and loss of bone stock while non traumatic AVN hip has an acetabulum that is spared of osteonecrosis and a better bone stock. Functional outcomes of both these group of patients has been assessed separately but never been compared with each other to the best of the authors' knowledge. (7, 8) We used the Harris hip score to assess functional outcomes as it has been widely used previously in multiple studies evaluating the functional outcomes of THR's and is also a validated tool. (9-14) Further, we also evaluated the patients in terms of their quality of lives, that denotes their general well-being using different validated and previously used scoring systems that spans different domains of daily life; SMFA questionnaire & SF-36.(15-20) These give a thorough estimate of the quality of life.

The present study used multiple, validated methods that has not been done before, to assess the results with comparable number of patients in both the groups giving it good strength. A single, vastly experienced and technically sound, senior arthroplasty surgeon performed all the surgeries offsetting any technical factors affecting the result. Also, a single investigator who was not involved at any time during surgical procedure collected all the data.

Being a retrospective study, we do acknowledge the limitations of this study. The pre-operative scores were not evaluated and the difference in technique with use of cement or meshes in some cases, mostly in group 2, were not documented. Further research is needed in the form of prospective studies to better answer this research question.

	NO.	AGE (yrs)	SEX (M:F)	HHS	SMFA	SF 36
AVN	50	39.32	3.2:1	87.04	11.51	50.70
TRAUMA	32	46.08	7:1	84.25	13.02	48.82
TOTAL	82	42.70	4.1:1	85.65	12.27	49.77

Table 1 depicting the mean values of results

	NO.	MEAN	Std. Dev.	95% Confidence Interval
AVN	50	87.04	9.649	84.30
TRAUMA	32	84.25	13.791	79.58

Table 2 depicting the results of HHS in both groups.

	NO.	MEAN	Std. Dev.	95 % Confidence Interval
AVN	50	11.50	10.494	8.42
TRAUMA	32	13.02	13.274	8.45

Table 3 depicting SMFA

	NO.	MEAN	Std. Dev.	95 % Confidence Interval
AVN	50	50.70	8.369	48.24
TRAUMA	32	48.82	10.036	45.37

Table 4 depicting SF 36

CONCLUSION

The short term outcomes of THR done for non-traumatic AVN hip and traumatic sequelae are equally good and there is no significant difference in both the functional outcome and the eventual quality of life achieved in these patients. Hence, there is no role of prior integrity of acetabulum in the ultimate functional outcome of total hip replacement.

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