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An evaluation of the outcome of revision hip arthroplasty among the patients with failed hip arthroplasty: An observational study

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Abstract

Background: Over the past two decades, developing countries like India have seen a rapid increase in joint replacement surgeries, which is akin to the international trend [3]. With an increasing primary hip joint replacement surgeries, there has been a perceptible rise in the number of revision hip joint replacement surgeries throughout the world [3]. Modern implant design and improved surgical techniques should result in improved long-term survival of adult joint reconstructions. Due increase in a number of primary THA in the young active population, coupled with increasing life span of older population has maintained a significant revision burden [3].

Material and Methods: This retrospective study was carried out in 30 patients of both sex and different age groups with variable indications of RHA, operated at tertiary care hospital in new civil hospital Surat. This study will employ longitudinal study designs and drawing of two data sets collected in two phases. Phase 1 – Approximately 30 desk review of medical records of patients from NCH-SURAT who went for RHA from May 2018 to November 2019 to determine reasons for RHA and to document functional outcome of RHA. Phase 2-30 patients who went for Revision hip arthroplasty from May 2018 to November 2019 will be traced from medical records of NCH SURAT within time period of 6 months from January 2020 to till June 2020. Post-operative Harris Hip Score will be measured to document functional outcome of RHR

Results: Results There were 30 patients in the study, of whom were 24 men and 6 women. The mean age of the study group was 59 years (range: 24-89 years). HHS taken on 3, 6, 9 month. total score of 70 or less than 70 is considered a poor 70 to 80 is considered fair, 80 to 90 is Good 90 to 100 is an excellent result, 23% -Excellent 63% good 7% fair 7% poor.

Conclusion: In our study, Aseptic loosening remain the main cause for failure of primary hip arthroplasty, Instability and dislocation remains a significant issue after both primary and revision hip arthroplasty. The operative results were eminently satisfactory in 88.33% of patients good results shown in our study reinforce the excellent outcomes reported in the literature of revision hip arthroplasty.

Keywords: Revision hip arthroplasty, aseptic loosening, infection, dislocation, Periprosthetic hip fracture, HHS, modern implant design

Introduction

Revision hip arthroplasty was defined as any surgery that involved an open procedure to address a mode of failure of the primary hip arthroplasty. It included revision of any component (acetabular or femoral) as well as exchange of modular parts (femoral head and acetabular liner) and irrigation and debridement to treat deep periprosthetic infection and DAIR (Debridement antibiotic implant retension) Closed reductions [5].

Over the past two decades, developing countries like India have seen a rapid increase in joint replacement surgeries, which is akin to the international trend. With an increasing primary hip joint replacement surgery, there has been a perceptible rise in the number of revision hip joint replacement surgeries throughout the world. Modern implant design and improved surgical techniques should result in improved long-term survival of adult joint reconstructions [3].

Potential reasons for hip revisions can be stratified into three groups: patient-related factors, implant-related factors and failures related to inadequate surgical technique. Osteolysis and aseptic loosening, resulting from the failure of bearing surfaces, are considered to be the most

common reasons for revision hip arthroplasty [5]. One of the most challenging aspects of revision total hip arthroplasty is the management of acetabular bone loss, which is variable in size and location and can be complicated by a pelvic discontinuity. The use of structural allografts has decreased in recent years because of technical difficulties, complications related to allografts, and guarded long-term results. Traditional options in these situations are a cage only or structural acetabular allograft protected by a cage [8,9].

Revision hip arthroplasty has a poorer outcome than primary arthroplasty due to the older age of the patients and technical difficulties., lesser we do timely intervention can increase functional outcome and limit additional damage to surrounding prosthetic soft tissue [10].

This study was conducted to evaluate the functional outcome and indications for revision hip arthroplasty and relate these to the time after the index primary hip arthroplasty.

Material and Methods

This retrospective study was carried out in 30 patients of both sex and different age groups with variable indications of revision Hip arthroplasty, operated at tertiary care hospital in new civil hospital Surat. This study will employ longitudinal study designs and drawing of two data sets collected in two phases.

Phase 1: Approximately 30 desk review of medical records of patients from new civil hospital Surat who went for Revision hip arthroplasty from May 2018 to November 2019 to determine reasons for Revision hip arthroplasty and to document functional outcome of revision hip arthroplasty. Patients undergoing conversion of a fracture fixation to a hip arthroplasty and those undergoing a second or further revision were excluded. Detailed demographic data for each patient were collected, including age at index hip arthroplasty, gender, and time from index primary hip arthroplasty to failure as well as the exact reason(s) for failure of arthroplasty, date of revision hip arthroplasty, preoperative HHS, 3, 6, 9 month HHS. The data sources reviewed included peri-operative charts, operative notes, discharge summaries and relevant radiographs.

For each hip, the reason for failure was classified into one of the following six categories: aseptic loosening, infection, instability, component failure, peri-prosthetic fracture, or pain.

Patient data was stratified on the basis of the time to failure, which was defined as the interval, in months, from the primary procedure to the revision. This was stratified into two separate groups, less than 5 years and more than 5 years (which was the mean for the study). All data were entered onto a spreadsheet to allow comparison between groups and the determination of the relationships between the different variables.

A tabulation of the overall results for the six independent variables (Age, diagnosis, gender, time to failure and reason for failure, HHS) was performed. The relationships between time to failure and reason for failure were also established.

Phase 2: 30 patients who went for Revision hip arthroplasty from May 2018 to November 2019 will be traced from medical records of NEW CIVIL HOSPITAL SURAT within time period of 6 months from January 2020 to till June 2020.

Once traced they will be briefed about this study and PIS will be given then after taking written consent, post-operative Harris Hip Score will be measured to document functional outcome of Revision hip arthroplasty.

Analysis will be done with triangulation of data sets collected in two phases.

Data entry will be done in MS excel & will be analyzed using SPSS 23 Lost to follow-up was defined using a 12-month end point. Exhaustive methods were used to locate all patients. 5 patients were categorized as lost-to-follow-up for the following reasons: 1 patients were infirmed; 1 patients were contacted but refused follow-up; and 2 patients had inaccurate contact information. 1 patient's preoperative Harris hip score not available.

Inclusion criteria

- All patients diagnosed as failure of Hip arthroplasty with severe hip pain, Mechanical loosening, dislocation, periprosthetic femur fracture, broken implant (stem), acetabulum wear and underwent Revision hip arthroplasty
- Age 18 and above

Exclusion criteria

Patient not willing for participation, Patients with incomplete records and irregular follow up, Infection, Non healing ulcer at same side or opposite limb, systemic inflammatory arthritis, neurological disorder, Any systemic infection Required data like Harris hip score missing from medical records.

Result

Results There were 30 patients in the study, of whom were 24 men and 6 women. The mean age of the study group was 59 years (range: 24– 89 years). The most common mode of failure of hip arthroplasty was aseptic loosening (n=17).

When the data on timing and mode of failure were further stratified into two groups with a mean time to failure of less than 5 years versus 5 years or longer approximately one-half of the hips (13 of 30 patient) that were revised had survived less than 5 years.

Differences were also noted between the causes of failure for the two groups.

The major cause of failure after 5 years was aseptic loosening. The mean survival time for failure due to aseptic loosening was 112 months (95% CI: 100–125 months), whereas mean survival time to failure due to other causes was 50 months (95% CI: 38–62 months).

In addition, no significant correlation between age at primary surgery (younger than 50 years and older than 50 years) and cause of failure was found.

The older group was most likely to fail because of aseptic loosening, while the younger group failed due to a variety of other causes.

The overall mean time to revision surgery was 83 months (range: 0–360 months).

The mean time to failure for hips was the shortest – a mean of 64 months (range: 3 Month- 10 year) – It is also evident that most of the failures occurring within the first 2 years can be attributed to joint instability, periprosthetic fracture and infection and total score of 70 or less than 70 is considered a poor result; 70 to 80 is considered fair, 80 to 90 is Good 90 to 100 is an excellent result.

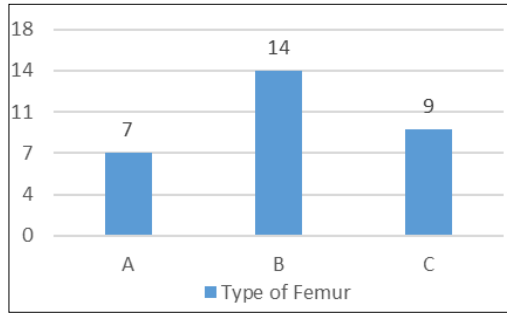


Fig 1: Type of Femur

Table 1: Type of Component Revision

	Yes	No
Acetabular Cup	29 (97%)	1 (3%)
Femoral	25 (83%)	5 (17%)

Table 2: Harris Hip Score at 9 Months

Score	Frequency
Excellent	7 (23%)
Good	19 (63%)
Fair	2 (7%)
Poor	2 (7%)

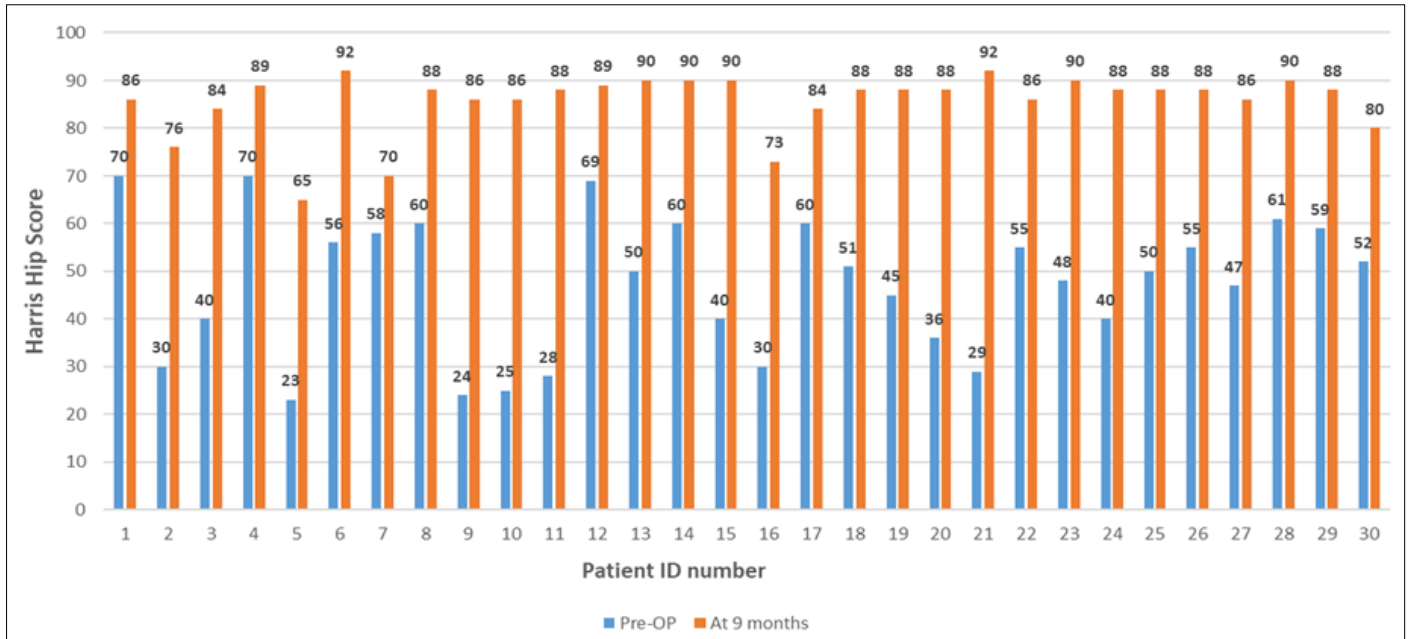


Fig 2: Harris hip score at Pre-op & at 9 month

Pre and Post-operative radiograph



Fig 1: 60-year male with aseptic acetabular cup loosening

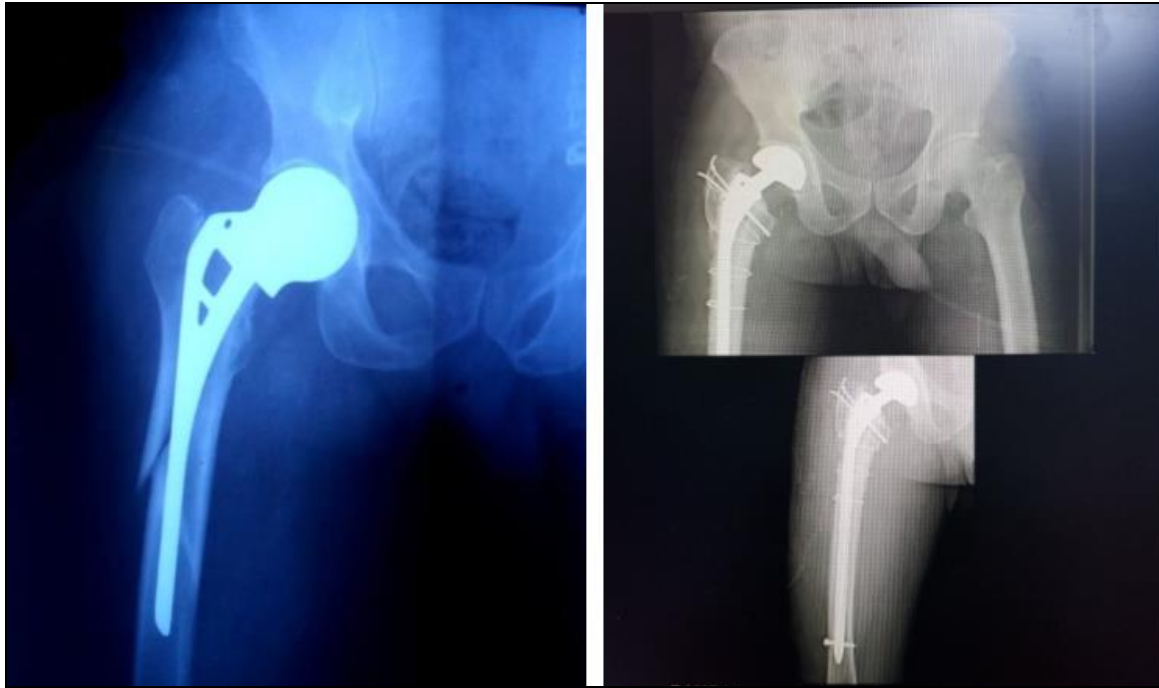


Fig 2: 50 year male with periprosthetic femur fracture revision done by distal locking long femur stem

Discussion

With increased knowledge about the mode of failure of primary hip arthroplasty and implant material, function of the hip joint has led to demands for painless hip joint, normal gait revision hip arthroplasty decreases morbidity and improves functional outcome. The main aim of revision is to restore the normal biomechanics of hip joint this retrospective observational study was conducted to analyse the reason of failure of primary hip arthroplasty and functional outcome of Revision hip arthroplasty for various indications.

The results of the study are compared with the known similar studies reported in literature. Our study included 30 patients who underwent revision hip arthroplasty, that were followed up for a period of 9 months In Anne Lübbecke, Jeffrey n. Katz^[11] mean HHS at 5 year was 78. The majority of patients with revision THA achieved good to excellent clinical results 5 years after the operation. Nevertheless, patient satisfaction and functional outcome were lower after revision THA. In his study he found that the less favorable results associated with revision THA were only partly explained by the greater morbidity and older age.

In Afshin Taheriazam *et al.*^[12] study there were 138 patient follow up period 2009-2014 mean of age patient 64.05(\pm 15.0), 90 male and 48 female and instability and aseptic loosening was the main cause of failure, preoperative mean HHS 44.93 \pm 8.40 post operative mean harris hip score 95.41 \pm 2.27.

IN our study at the end of 9 month HHS was 88 \pm 7.57 which suggest good functional outcome after revision hip arthroplasty and due to less duration of study period, small sample size and also we found that aseptic loosening was the most common indication for revision.

Limitation

Sample size in our study is small compared to other studies. Clinical outcomes were reviewed retrospectively. There is no information regarding the presence or magnitude of any bone defects. The follow-up period of this study is comparatively for short period therefore we shall do the medium to long term follow-up of all cases in future.

Conclusion

In our study, Aseptic loosening remain the main cause for failure of primary hip arthroplasty, Instability and dislocation remains a significant issue after both primary and revision hip arthroplasty. Acetabular cages are still an important element of the armamentarium for the management of severe bone loss associated with acetabular revisions. Cages made of biomaterials that allow bone ingrowth would be an excellent tool for complex acetabular revisions. Most of the complications faced were superficial infection and deep infection which resolved by 2 weeks after intravenous antibiotic. The operative results were eminently satisfactory in 88.33% of patients good results shown in our study reinforce the excellent outcomes reported in the literature of revision hip arthroplasty.

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