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Functional outcome of total hip arthroplasty in young adults: A retrospective study

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Abstract

Background: Management of end – stage hip in young adults (< 50 years) remains a challenge. Hip - preserving surgeries in the setting of advanced often do not provide adequate pain relief. The implications of total hip arthroplasty in young patients is a matter of concern regarding the outcome and durability of the prosthesis. Improved techniques and biomaterials have stimulated the demand for total hip arthroplasty in young and active individuals

Materials and Methods: A retrospective study of cases done between 2011 to 2015. A total of 225 patients, average age 35 (20 – 50) operated at Department of Orthopaedics, Vydehi Institute of Medical Sciences & Research Centre. Patients were followed up for a period of 3 years. Harris Hip score was used to evaluate the outcome and the Wilcoxon ranked T test was used to calculate p value.

Results: An average follow up of 41 months (range 13 – 86) was done. The mean post-operative Harris hip score was significantly improved with p value <0.001. Postoperative complications included superficial infection, dislocation.

Conclusion: Total hip arthroplasty is an excellent option for management of end stage hip disease in young adults. Modern uncemented implants and alternate bearing surfaces have significantly improved longevity and reduced revision rates.

Keywords: THA, total hip arthroplasty, harris hip score

Introduction

Total hip arthroplasty has dramatically relieved pain and improved function in patients with advanced joint disease. The management of end – stage hip disease in the young patients (< 50 years) remains a challenge ^[10]. Many patients present with advanced joint disease which are not amenable to joint salvage procedures. The etiology of the disease in young adults varies from rheumatoid arthritis, ankylosing spondylitis, osteonecrosis of the head of femur and traumatic conditions like fracture neck femur ^[1].

The primary goal of performing THA are the same regardless of the patient age: to relieve pain and improve function. Regardless of the cause of arthrosis, relieving pain is the primary indication to perform a THA. In a young patient with a mean life expectancy of 50 – 60 years the long-term implications of performing a THA make the secondary goals of bone and muscle preservation and prolonged implant durability more important. The complexity of performing a THA in a young patient often requires careful preoperative planning to ensure success when compared to a conventional THA ^[10].

Young patients would frequently have undergone previous surgeries, have retained instruments, extensive scar tissue or heterotopic ossification. It is common to encounter poor bone quality from disuse osteopenia, abductor muscle insufficiency, joint stiffness and contractures. Pre-operative templating with magnification – controlled radiographs is useful. Narrow femoral stems, modular prosthesis, and press -fit porous components may be required. Improvements in bearing surfaces have contributed to the increasing number of THA done in young. Highly cross- linked polyethylene has considerably reduced poly wear rates and osteolysis. Development of hard – on – hard bearing surfaces (eg, metal –on- metal, ceramic – on- ceramic) has the potential to reduce wear rates in the long term ^[8].

Patients and Methods

From June 2011 till June 2015, a total of 225 patients in the age group 20 – 50 years who had undergone THA in Vydehi institute of medical sciences and research centre were analysed retrospectively.

Among the patients 40% (n=89) had been diagnosed with avascular necrosis, 12% (n=27) with secondary osteoarthritis, 10% (n=22) with rheumatoid arthritis, 23% (n=51) with ankylosing spondylitis, 16% (n=36) with fracture neck of femur. 58% (n=131) were male and 42% (n= 94) were female.

All patients were evaluated clinically and radiographically with review of serial follow- up radiographs. Investigations conducted in pre-operative period included a septic screen (full blood count, ESR, CRP) and plain anteroposterior and lateral radiograph of the symptomatic hip and pelvis radiograph.

Pre-operative templating was done for all hips after magnification. Special stems and acetabular shells with augments were arranged based on templating. All patients received perioperative antibiotic prophylaxis and thrombolytic prophylaxis given.

All the patients were operated by the senior authors. A standard posterior approach to the hip was used in all patients. At operation the condition of the articular cartilage, and the acetabulum, the stability of the prosthesis in the proximal femur were documented by the surgeon. Intra operatively, stability was examined by observing for dislocation. Both horizontal and vertical offsets maintained to pre-operative values as measured in templating. Posterior soft tissue repair was performed in all patients using no. 5 Ethibond.

Patients who had post-operative dislocation were managed conservatively using closed reduction. Patients with acetabular defects were managed with autologous bone grafts. Uncemented cup was used in 68% (n= 152), cemented cups in 27% (n= 61) and hybrid in 9% (n= 20). Low molecular weight heparin (enoxaparin sodium 40 mg subcutaneous) was used for deep vein thrombosis prophylaxis. IV Ceftriaxone + sulbactam was given for antibiotic prophylaxis.

Static quadriceps exercises and knee and ankle mobilization were started on the day of surgery. All patients were allowed to with tolerable weight bearing with walker or crutches on the day after surgery. 14 patients who had periprosthetic fractures were kept non -weight bearing walking until radiological evidence of fracture union whereas 10 patients with acetabular reconstruction using autogenous morsellised bone graft were allowed partial weight bearing for first 3 weeks. Results were evaluated using the Harris hip score. The

pre-operative Harris hip score were obtained from hospital records. Postoperative scores were operated at each follow – up visit and telephonic interview. All the patients were available for follow- up.

Results

The Wilcoxon signed ranks test was used to measure the outcome statistically. The mean pre – operative Harris hip score was poor in 36% (n= 81), fair in 60% (n= 135), good in 4% (n= 9). The mean postoperative Harris hip score significantly improved postoperatively to fair in 6% (n= 13) good in 40% (n = 90) and excellent in 54% (n= 122)

The mean limb length discrepancy was 11 mm (range 10-12 mm). 12 patients had a superficial infection managed with local antibiotics. 8 patients had dislocation in the postoperative period managed with closed reduction. 14 patients had periprosthetic fractures managed conservatively.

Discussion

THA is a reliable and predictable method for improving pain, function and quality of life in patients with advanced hip disease. Its applicability to young (< 50) patients has been marred with failures of fixation and osteolysis.

A summary of selected studies of THA performed in young patient population is listed in table 1. When compared to our series of 225 patients, Learmonth *et al* reported no revisions at a mean follow up of 8.5 years but included only 14 hips.

The follow up duration of our study was small when compared to other studies. The importance of long-term follow - up in this population is illustrated by Dorr *et al*, who had a mean follow - up of 16.2 years.

Table 1: Our study compared favourably with other studies in literature

Case series	No. of hips	Mean age in years	Mean follow-up in years	No. Of hips revised
Dorr <i>et al</i> .	81	30	16	33
Halley & Charnley	49	40	9.5	7
Learmonth <i>et al</i>	14	36	8.5	none
Our series	225	35	3	none

Our series is one of the largest hip study done only second to the ishk registry for outcomes in young adults. Some of the drawbacks of the the study were it is a retrospective study, the follow- up period was short, and the assessment using pre-operative and post-operative Harris hip score was not done by a single assessor.

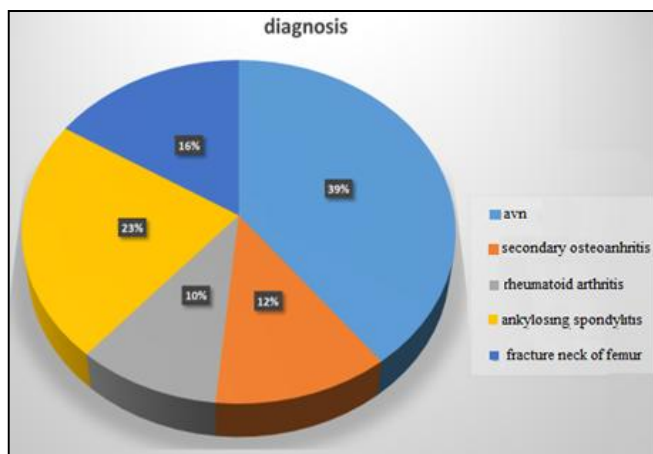


Fig 1: Graph of distribution according to diagnosis

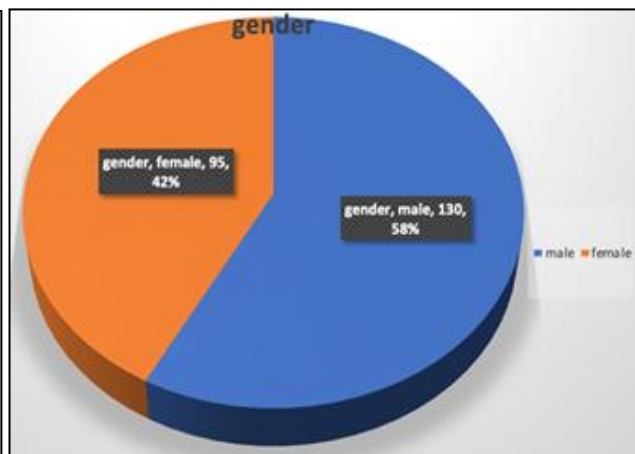


Fig 2: Graph of distribution according to sex

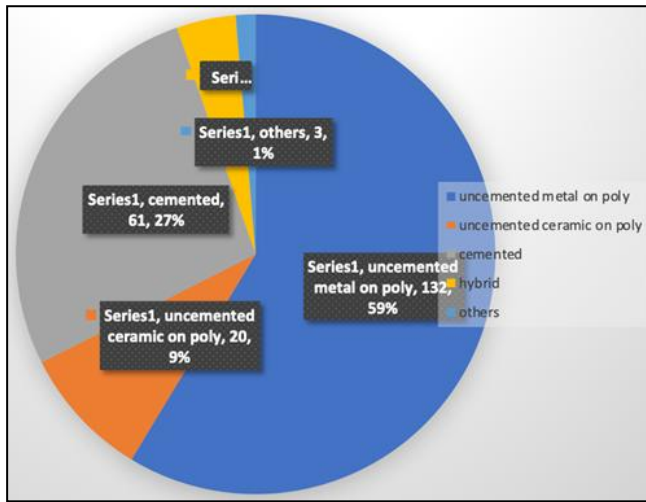


Fig 3: Graph of distribution according to components

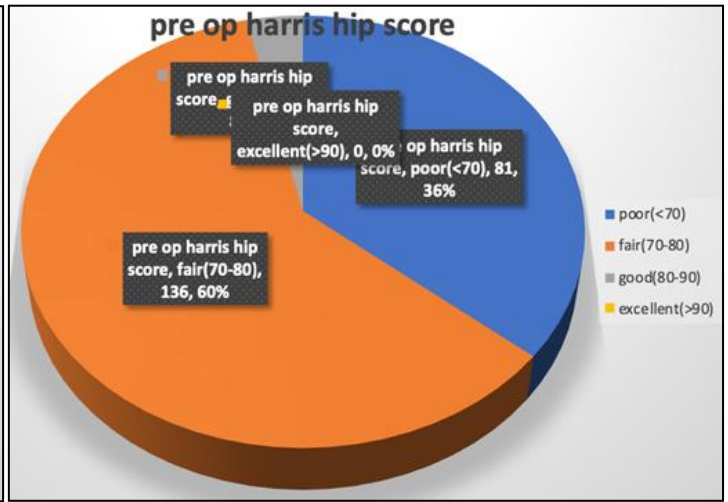


Fig 4: Graph of Pre op Harris hip score

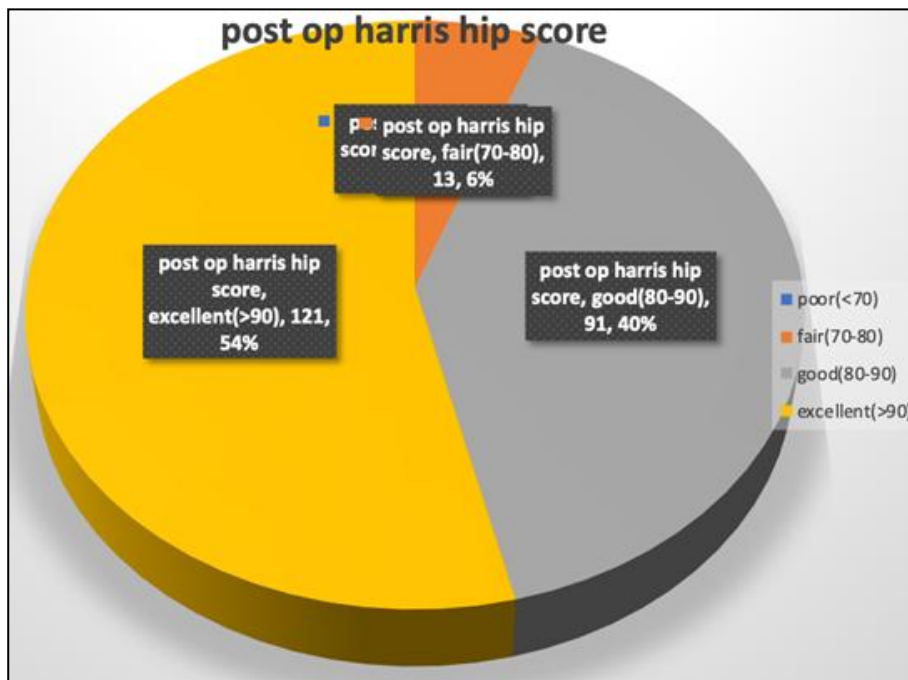
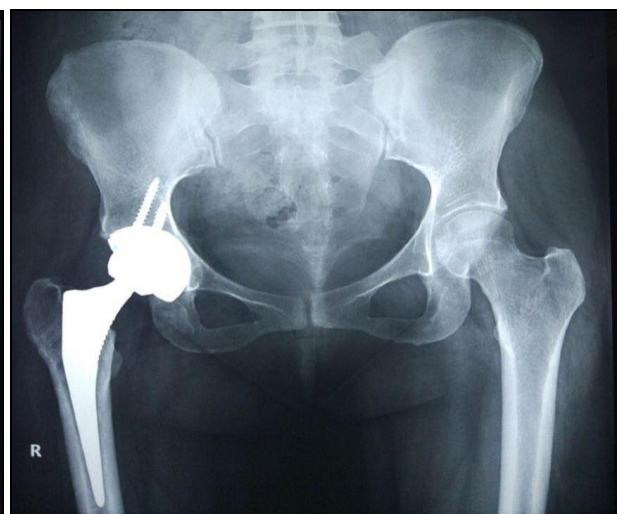


Fig 5: Graph of Post op Harris hip score

CASE 1



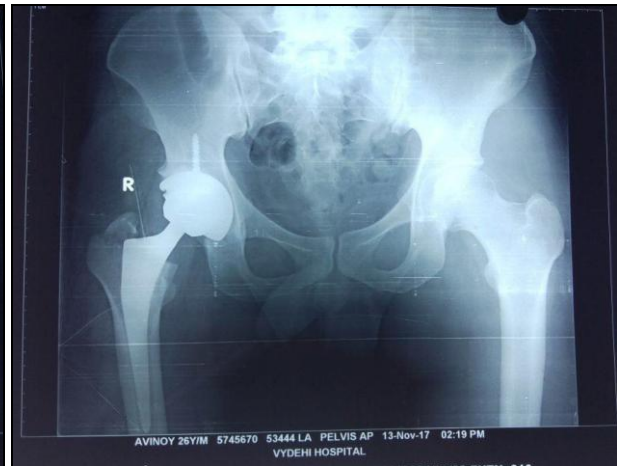
CASE 1: Non Union Neck Of Femur Pre Op X Ray



CASE 1: Post Op X Ray

Case 2

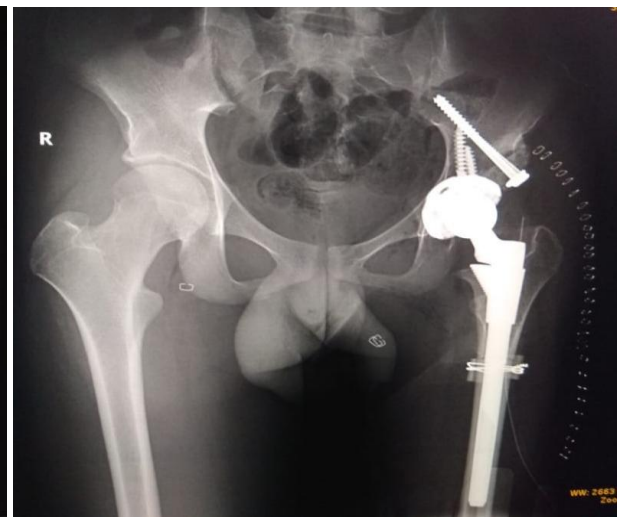
Case 2: Avn Pre Op X Ray



Case 2: Post Op X Ray

Case 3

CASE 3: Dysplastic Hip Pre Op X Ray



CASE 3: Post Op X Ray

Conclusion

THA is an excellent option for management of end-stage hip disease in the young patient. It can be a complex procedure due to the complicated nature of deformities that lead to early arthrosis, hence careful pre-operative planning is necessary. Modern uncemented implants, alternate bearing surfaces have significantly improved longevity and reduced revision rates.

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