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Clinical Profile of patients subjected for total hip arthroplasty at a tertiary care hospital

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Abstract

Total hip arthroplasty evolved as a result of many improvements in design of femoral head prosthesis, the availability of suitable component materials and manufacturing techniques, a better understanding of hip mechanics, and the need for resurfacing the acetabulum. Charnley did pioneering work in all aspects of total hip arthroplasty, including the concept of low frictional torque arthroplasty, surgical alteration of hip biomechanics, lubrication, materials, design, and operating room environment. A retrospective study was conducted on 30 hips of 22 patients who underwent primary uncemented total hip arthroplasty for advanced arthritis for various indications at the Department of orthopaedics. The most common indication for surgery was avascular necrosis of femoral head in 21 hips (70%) in 13 patients. The other causes being secondary arthritis due to non-union fracture neck of femur in 4 hips (13.3%), ankylosing spondylitis in 3 patients (10%), perthes disease and developmental dysplasia of hip group had 1 patient (3.3%) each.

Keywords: Total hip arthroplasty, ankylosing spondylitis, avascular necrosis

Introduction

An awareness of the history of hip arthroplasty is necessary to appreciate not only its current status, but also its future. The use of biological and inorganic materials for hip arthroplasty became popular in the early 20th century. Deformed or ankylosed joint surfaces were contoured, and an interpositional layer was inserted to resurface the joint and allow motion^[1]. Fascia lata grafts and periarticular soft tissues were used extensively in the United States and Europe. Jones used gold foil as an interpositional layer in 1912. Results remained unpredictable, with residual pain and stiffness being the primary causes of failure. In 1923, Smith-Petersen introduced the concept of "mould arthroplasty" as an alternative to the interpositional membrane^[2]. The procedure was intended to restore congruous articular surfaces by exposing bleeding cancellous bone of the femoral head and acetabulum, with subsequent metaplasia of the fibrin clot to fibrocartilage under the influence of gentle motion. Glass was chosen as the material for the first mold, after Smith-Petersen discovered a smooth synovial membrane surrounding a glass foreign body removed from a patient's back. Although all the glass molds implanted broke within a few months, the initial results were encouraging and prompted a search for more durable materials. Pyrex, viscaloid (a celluloid derivative), and Bakelite versions also were discarded because of fragility or severe foreign body reaction. After the development of Vitallium by Venable and Stuck in 1937, implants of sufficient durability became available. The Smith-Petersen cup arthroplasty with subsequent modifications by Aufranc became the standard for hip reconstruction until the advent of modern-day total hip arthroplasty^[3,4].

Total hip arthroplasty evolved as a result of many improvements in design of femoral head prosthesis, the availability of suitable component materials and manufacturing techniques, a better understanding of hip mechanics, and the need for resurfacing the acetabulum. Charnley did pioneering work in all aspects of total hip arthroplasty, including the concept of low frictional torque arthroplasty, surgical alteration of hip biomechanics, lubrication, materials, design, and operating room environment. A major advancement was his use of cold-curing acrylic cement (polymethyl methacrylate [PMMA]) for fixation of the components. His periodic reviews and those of other investigators of the results in numerous patients have been

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invaluable, especially concerning wear, infection, loosening, and stem failure. It immediately became apparent, however, that success depended on careful selection and evaluation of patients and on meticulous attention to operative technique and asepsis [5]. Only with long-term follow-up studies of more than 5 years did it become apparent that implant breakage, trochanteric nonunion, loosening, wear, and periprosthetic bone loss were substantial problems. These issues gave rise to many changes in the design and materials used for fabrication of the femoral prosthesis and cup, improvement in how cement is used, and changes in surgical approaches and techniques. The basic concept of low frictional torque arthroplasty has become established, and the metal-on-polyethylene articulation remains the standard in total hip arthroplasty [6].

Methodology

A retrospective study was conducted on 30 hips of 22 patients who underwent primary uncemented total hip arthroplasty for advanced arthritis for various indications at the Department of orthopaedics.

Following were the inclusion and exclusion criteria followed in our study:

Inclusion Criteria

1. Patients in the age group between 40-70 years
2. Suffering from hip arthritis unilateral or bilateral who were treated with primary uncemented total hip arthroplasty

Exclusion Criteria

1. Patients who had previous surgery(s) of the involved hip
2. Patients with associated co morbid conditions such as diabetes mellitus, cardiac diseases, renal and respiratory problems

A total of 22 patients were underwent primary uncemented total hip arthroplasty by posterior approach. All these patients were available during the time of our study. All the patients were contacted for clinical and radiological assessment through postal and personal communication. All 22 patients attended the review arthritis clinic on a previously provided appointment date. The diagnosis, preoperative assessment, operation records and follow

up radiographs of these patients were systematically reviewed from the available hospital data.

During this clinical assessment, patient's identity was verified and confirmed. The follow-up records of clinical assessment by assessment of pain and activity restriction were done with the questionnaire as per the study proforma and also modified Harris hip score was evaluated at the same setting.

All the patients were operated by the same surgical team headed by the same senior arthroplasty surgeon. 8 patients underwent staged bilateral hip replacement surgery and 14 patients underwent unilateral surgery.

Radiological assessment was done with radiographs of anteroposterior and frog leg lateral views of pelvis with hip joints including entire proximal femur till the tip of the femoral prosthesis. These radiographs were assessed for component placement, inclination, coverage and migration on acetabular side were particularly noted, osteolysis was looked for according to the system of DeLee and Charnley.

Results

Table 1: Age distribution

Age in years	No. of patients	%
40-50	6	27.3
51-60	13	59.1
61-70	3	13.6
Total	22	100.0

The average age of patients is 54.91 years ranging from 40 to 70 years of age. Out of 22 patients, 6 patients (27.3%) belonged to age group between 40-50 years, 13 patients (59.1%) belonged to age group 51-60 years and 3 patients (13.6%) belonged to age group between 61-70 years.

Table 2: Sex distribution

Gender	No. of patients	%
Female	5	22.7
Male	17	77.3
Total	22	100.0

Out of 22 patients, 5 patients (22.7%) were females and 17 patients (77.2%) were males.

Table 3: Indications for surgery

Indication for Surgery	No. of Hip Replacements	%
1. Secondary OA due to AVN of femoral head	21	70.0
2. Secondary OA due to Ankylosing spondylitis	3	10.0
3. Secondary OA due to DDH	1	3.3
4. Secondary OA due to Nonunion Fracture neck of femur	4	13.3
5. Secondary OA due to Perthes disease	1	3.3
Total	30	100.0

The most common indication for surgery was avascular necrosis of femoral head in 21 hips (70%) in 13 patients. The other causes being secondary arthritis due to non-union fracture neck of femur in 4 hips (13.3%), ankylosing spondylitis in 3 patients (10%), perthes disease and developmental dysplasia of hip group had 1 patient (3.3%) each.

Table 4: Side affected

Side Affected	No. of hip replacements	%
Left	16	53.3
Right	14	46.7
Total	30	100.0

In our study, 8 patients underwent bilateral total hip arthroplasty and 14 patients underwent unilateral total hip arthroplasty, of which 14 total hip arthroplasty was done right side (46.67%) and 17 on left side (53.33%).

Discussion

Total hip arthroplasty is a surgical procedure is done mainly to relieve incapacitating pain arising from the hip joint and its success lies on its ability to relieve this pain associated with hip joint pathology, while maintaining the stability and mobility of the hip joint.

This is a retrospective study conducted on 30 hips of 22 patients who underwent primary uncemented total hip arthroplasty and

were available for follow up. 8 patients underwent bilateral total hip arthroplasty and 14 patients underwent unilateral total hip arthroplasty. 14 total hip arthroplasty was done right side (46.7%) and 16 on left side (53.33%). The study was conducted between age groups of 40-70 years with a mean age of 54.9 years at the time of index surgery. There were 17(77.2%) males and 5 (22.7%) females.

The most common indication for surgery was avascular necrosis of femoral head in 13 patients (59.09%). The other causes being secondary arthritis due to non-union fracture neck of femur in 4 patients (18.18%), ankylosing spondylitis in 3 patients (13.63%), perthes disease and developmental dysplasia of hip group had 1 patient (4.54%) each.

We used prosthesis of Depuy Company in all the hips. We used Corail stems with Duraloc cup and liners. The minimum patient follow up period was 18 months and maximum being 72 months with average follow up of 43.2 months.

Total hip arthroplasty is a well documented surgical procedure. The study was carried out on 30 hips of 22 patients who underwent primary uncemented total hip arthroplasty. In the literature by Sandiford N et al. ^[7], Keijo T et al. ^[8] and kawamura H et al. ^[9] total hip arthroplasty has been described in patients older than 50 years of age. In our study majority of patients were above the age of >50 years of age accounting for 72.7% of which 59.1% of patients were between the age group of 51-60 years, with age ranging from 40-70 years and mean age of 54.91 years at the time of index operation. Thus our study is comparable with above studies.

Conclusion

In our study, 8 patients underwent bilateral total hip arthroplasty and 14 patients underwent unilateral total hip arthroplasty, of which 14 total hip arthroplasty was done right side (46.67%) and 17 on left side (53.33%).

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