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ORIGINAL ARTICLE

Cemented Total Hip Arthroplasty: A Study of 100 Cases

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ABSTRACT

Introduction: The cemented total hip athroplasty (THA) has been in existence for about three decades; however, objective outcome analysis of patients subjected to this procedure in India is lacking. At Joint Replacement Centre, Military Hospital (MH), Kirkee, Pune, Maharashtra, India, a large database of total hip arthroplasties exists. The cemented hip arthroplasties are being done regularly at MGM Medical College & Hospital, Kamothe. However, the functional results of cemented hips operated from 2003 to 2015 have been analyzed to assess the objective outcome.

Materials and methods: A prospective and retrospective study of 100 cemented hips in 92 patients between 26 and 78 years of age was carried out. Sixty-one (74%) patients were in the age group of 50 to 70 years. The diagnosis of these patients was avascular necrosis: 40; rheumatoid arthritis: 15; ankylosing spondylitis: 8; osteoarthritis: 12; fracture neck femur: 16; and fracture femoral head: 1. In all patients, cemented THA using Indian Orthopedics (INOR) indigenous and Zimmer implants were done. Three types of implants were used, Charnley 22 mm head, 26 mm head using INOR modular system and collarless polished tapered Zimmer system. Eight cases had bilateral involvement. The cases were followed up for varying periods from 1 to 10 years.

Results: The results were assessed by utilizing Charnley activity and pain score. There were 83% excellent, 8% good, 5% fair, and 4% poor results. Three cases required revision, two because of frank loosening, and one due to acetabular malpositioning. Charnley pain score improved from 2.2 preoperatively to 5.2 postoperatively (+28.3% change).

Conclusion: The cemented THA is an excellent salvage procedure for advanced hip disorders resulting in pain and disability, especially in late age groups beyond 50 years.

Keywords: Avascular necrosis, Deep vein thrombosis, Indigenous implants, Total hip arthroplasty, Zimmer implants.

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INTRODUCTION

The cemented total hip athroplasty (THA) has been in existence for about three decades; however, objective outcome analysis of patients subjected to this procedure is lacking.[1] In the current state of health care today, attention has to be directed to the cost of medical treatment with as much emphasis as the clinical outcome.[2] Most total hip replacement procedure has been evaluated by means of case studies.[3] Most cases come from different centers with virtually every known combination of patient, disease, surgeon, implant, and approach. Hence, there is no standardization and universally accepted outcome measures.

The joint replacement center, Military Hospital (MH), Kirkee, has been performing THA for the past more than 40 years. A large database of primary hip arthroplasty has been built up. This paper, however, will describe the results of 100 total hip arthroplasties done at MH, Kirkee, and MGM Medical College & Hospital, Navi Mumbai, where regular cemented hip arthroplasties is being done. The cases have been followed up for varying periods from 1 to 10 years.

MATERIALS AND METHODS

Ninety-two patients (100 hips) who underwent THA in the Joint Replacement Center of MH, Kirkee, and MGM Medical College & Hospital, Navi Mumbai, were included in this study. Bilateral THA was done in eight patients. Preoperatively, the Charnley class of activity, pain score, and functional scores for hip disability were recorded on each patient.[4,5] Data on pain, functional activity levels, range of hip motion, limb length discrepancy, and need for orthotic support were recorded. Standard posterior approach was adopted in all cases.[6] No trochanteric osteotomy was done. Cemented THA with first-generation cementation and Indian Orthopedics and Zimmer prosthesis were used. Surgical complications like operation site hematoma, deep/superficial infection, nerve palsy, dislocation, and medical complications like embolism, deep vein thrombosis (DVT), and gastrointestinal bleeding were recorded. Standard radiographic analysis of component position and cement bone interface were done

Fig. 1: Preoperative X-ray with nonunion neck femur fracture

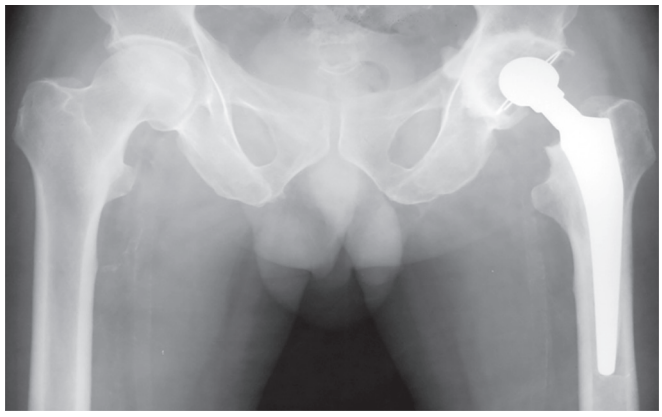

Fig. 2: Postoperative X-ray with cemented total hip replacement

Fig. 3: Preoperative X-ray with a vascular necrosis femoral head

Fig. 4: Postoperative X-ray with cemented THR for avascular necrosis

at 6-month intervals.[7] Representative cases are shown from Figures 1 to 4.

All cases were followed for varying periods from 1 to 10 years. At the end of follow-up period, all postoperative results were graded into excellent, good, fair, and poor as per the following criteria:

Excellent	No limp, no pain, no need for external support.
Good	Mild activity-related pain, mild limp which disappears on using walking aid.
Fair	Moderate activity-related pain, limp, needs walking stick.
Poor	Pain at rest, severe lurch, walking impossible even with walking aid.

OBSERVATION AND RESULTS

One hundred primary cemented THAs were included in the study. The details regarding patient characteristics (age and sex) are summarized (Table 1). Indications for THA are given in Table 2. Seventeen cases had undergone previous hip surgery (other than THA/hemiarthroplasty),

Table 1: Sex and age distribution

		Number		
Sl. no.	*Age distribution*	*Male*	*Female*	*Total*
1	<30 years	2	0	2
2	31–40	4	2	6
3	41–50	4	6	10
4	51–60	18	10	28
5	61–70	26	7	33
6	71–80	12	1	13
	Total	66	26	92 (100%)

Table 2: Indications for THA

Sl. no.	*Pathology*	*No. of cases*
1	Avascular necrosis	48
2	Rheumatoid arthritis	15
3	Ankylosing spondylitis	8
4	Osteoarthritis	12
5	Fracture in femoral neck	16
6	Fracture in femoral head	1
	Total	100

Table 3: Types of previous surgery

Sl. no.	Types of surgery	No. of cases
1	Failed fracture fixation with dynamic hip screw	6
2	Fracture fixation with pins	4
3	McMurray's osteotomy	1
4	Synovectomy/debridement/biopsy	2
5	Core decompression with fibular bone grafting	4
	Total	17

such as fracture fixation and osteotomy. The details of previous surgery are shown in Table 3.

The majority of patients was in the age group of 50 to 70 years. The oldest patient was 78 years, a case of fracture neck femur. The youngest patient was a 26-year-old male, a case of posttraumatic avascular necrosis of right femoral head. The Charnley class of activity preoperative was recorded. About 60% had class A activity, 25% had class B activity, and 15% had class C activity. The mean preoperative pain score was 2.2 in the series of 100 hips. At 6 months postoperative follow-up, the mean pain score had improved to 5.5. The mean preoperative function score was 3.5, and this improved postoperatively at 6 months to 5.2. The results of the procedure are summarized in Table 4.

Of the cases followed radiographically for 1 to 10 years, 2 hips had gross endosteal femoral lysis and 1 case had early atrophy of calcar of the femur. There were 3 cases which were radiographically loose at maximum follow-up of 8 years. Of the 100 hips followed up, the postoperative functional results were excellent in 83, good in 8, fair in 5, and poor in 4. There were 2 wound infections, 3 dislocations, and 2 sciatic nerve palsies. Of the 2 wound infections, 1 was managed conservatively with dressing and antibiotics while in the other case implant removal had to be done. For the dislocations, 1 was reduced by open reduction while other 2 were reduced by closed method. Sciatic nerve palsies were managed conservatively and recovered in 10 to 12 weeks. There was no case of mechanical failure in any of the operated hips. Complications are summarized in Table 5.

Table 4: Primary total hip arthroplasty: Charnley scores

Category	Preoperative	Postoperative	Change
Pain score	2.2	5.5	+55%
Function score	3.5	5.2	+28.3%

Table 5: Complications

Sl. no.	Complications	No. of cases
1	Infection	2
2	Dislocation	3
3	Sciatic nerve palsy	2
4	Heterotopic ossification	1
	Total	8

DISCUSSION

The defining criteria for success with total hip arthroplasty includes predictable fixation to the skeleton, the performance of an implant in difficult patient populations, and long-term success without causing bone loss from the skeleton.[8] In this series of 100 hips, the THA was performed with standard indigenous Indian prosthesis, and Zimmer implants has offered superb improvements in quality of life and function. The outcome measure used in the present study was Charnley activity score. The mean preoperative pain score of 2.2 improved to 5.5. Preoperative function score of 3.5 improved to 5.2 in a span of 6 months in the present series. The excellent early results demonstrated in this series compares favorably with outcome using more costly foreign made prosthesis.[9,10]

Patient selection is an important criterion in establishing the cost-effectiveness and long-term benefit analysis of the procedure of THA. Too often it is seen that hip replacement is being "loosely" offered to an undeserving patient without exploring other orthopedic alternatives. Increasingly, total hip replacement is being offered to patients with fracture neck femur. It is recommended that despite the excellent results, THA is a "salvage" procedure and should be considered after all alternatives are exhausted. As such, it is not recommended for performing cemented THA on any patient less than 30 years of age. Cementless THA and surface arthroplasties are being done more frequently for younger patients. The absence of significant postoperative infections in this series can be partly attributed to the availability of dedicated joint replacement operation theater (OT) with laminar flow.

It has been found that standard prophylactic measures against DVT in the form of preoperative and postoperative injection clexane for 10 days and physiotherapy are very effective in all cases of THA to prevent DVT. No patient had clinical evidence of DVT. Thus, only clinical methods to assess DVT were used in this study, and more conclusive study using laboratory methods to diagnose DVT is needed before recommending the above protocol as a standard DVT prophylactic measure in total hip surgery.

CONCLUSION

The cemented THA procedures reproduced excellent results in most cases deserving hip replacement. The standard posterior approach is excellent for replacement surgery. Infections can be eliminated to a great extent by using dedicated OT and laminar air flow systems. Proper patient selection is essential to ensure longevity of prosthesis and maintenance of good postoperative results.

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