

SURVIVAL OF PRIMARY CEMENTED TOTAL HIP ARTHROPLASTIES IN EAST AFRICA

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ABSTRACT

Introduction: Total Hip Arthroplasties (THA) have been carried out in East Africa for over two decades. Data from European and American centres suggests that cemented implants have survivorship of over 80% at 25 years. There is a paucity of data concerning survivorship of implants in Africa. This study was conducted as a follow up study to determine the survival of primary cemented THA implants at the PCEA Kikuyu Hospital.

Methods: A retrospective cohort study was conducted of all patients undergoing primary THA at the centre since 1998. Patients were followed up in the outpatient clinic. In addition, patients who had not returned for follow-up in the last 12 months were contacted by phone and/or mail. A wide variety of cemented and non-cemented implants were used. End points of the implant were revision or removal for any reason. Survival was analysed by the use of Kaplan Meir tables. The study was approved by the institution ethics committee.

Results: There were 655 patients with a mean follow up of 31.4 months (10.2 – 146.9). The overall complication rate was 7.5%. The most common indications for the THRA were osteoarthritis (81.7%), fracture of the neck of femur (9.8%) and osteonecrosis of the femoral head (3.8%). Twenty nine implants were revised or removed with aseptic loosening being the commonest indication. The overall survival was 75% at 12 years.

Conclusion: The twelve year survivorship of cemented implants in our region is lower than other reported studies. This data can be useful in preoperative counselling of patients. We recommend the establishment of specialised centres and improving in cementing techniques so as to improve patient outcomes.

Key words: Survival, Total hip, Hip arthroplasty, Cemented, East Africa

INTRODUCTION

Total hip replacements are successful in relieving pain and restoring joint mobility in patients with a variety of pathologies. Total Hip Replacement Arthroplasties (THRA) have been carried out in Kenya since around 1981 albeit erratically (1). These were initially conducted in a small number of centres but the service has grown to cover many areas in the region (2). Data from European and American centres suggests that cemented implants have survivorship of over 80% at 25 years (3). There is a paucity of data concerning survivorship of implants in Africa. Due to a paucity of data on survivorship of implants in the region, the surgeon in Africa is forced to use data from European and American centres when discussing expected survival with patients and their relatives. To try and determine locally applicable data, we conducted a follow up study to determine the survival of THRA implants at the PCEA Kikuyu hospital in Kenya.

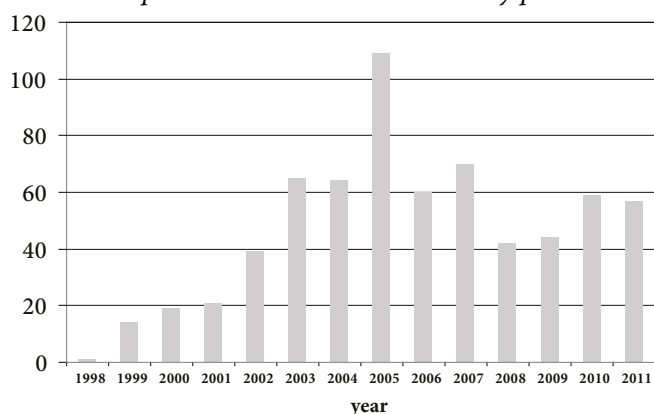
MATERIALS AND METHODS

A retrospective cohort study was conducted of all patients undergoing THRA at the centre from 1998 to 2011. The surgeries were conducted by several surgeons of varying levels of experience. The lateral approach was used in all cases. The cementing technique was manual (1st generation techniques) in all cases. Patients were followed up in the outpatient clinic. In addition, all patients who had not returned for follow-up in the last 12 months were contacted by phone and/or mail. End points of the implant were revision or removal for any reason. Survival was analysed by the use of Kaplan Meir tables. The study was approved by the hospital institution ethics committee.

RESULTS

In the twelve year period there was a total of 664 primary total hip arthroplasties conducted at our unit (Figure 1).

We excluded 13 patients who received non cemented implants and nine patients who had inadequate data. This left 642 patients with a mean follow-up period of 31.2 months (0.2–146.9) of whom 102 were contacted via telephone. The three most common indications for the THRA were osteoarthritis, fracture of the neck of femur and osteonecrosis of the femoral head (Table 1).

Figure 1*Arthroplasties conducted over the study period***Table 1**
Patient diagnoses

Diagnosis	No.	(%)
Osteoarthritis	521	81.2
NOF fracture	65	10.1
Osteonecrosis	25	3.9
Post traumatic arthritis	8	1.2
Hip dysplasia	6	0.9
Rheumatoid	3	0.5
Failed ORIF	2	0.3
Hip ankylosis	2	0.3
Not recorded	10	1.6
Total	642	100

A variety of implants were used with the three most common implants being Depuy (70%), Biomechanica (10%) and Tournier (10%). The mean age of the patients was 63 years (SD 10.4) with a male to female ratio of 1:2. The overall complication rate was 7.5% with dislocation being the most common complication (Table 2).

Table 2*Post operative complications*

Complication	No.	(%)
Dislocation	22	3.4
Infection	9	1.4
Fracture	7	1.1
Nerve injury	4	0.6
VTE	6	0.9
Total	48	7.5

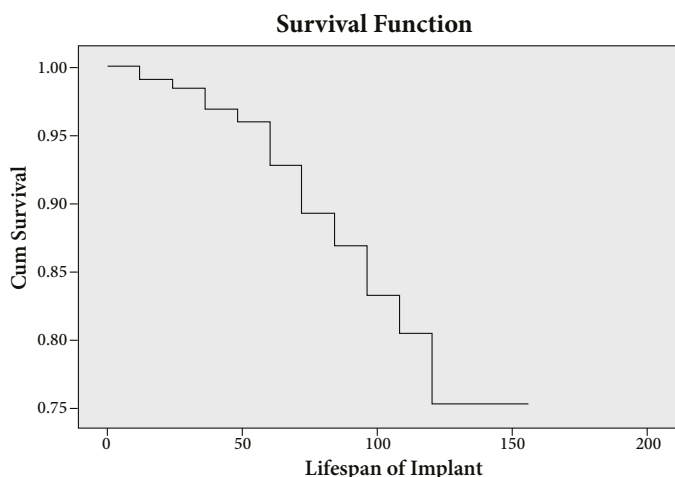
In the follow-up period, 10 patients died, 22 patients underwent revision arthroplasty (cup, stem or both components) and six patients had their implants removed left with a girdle-stone resection arthroplasty with no significant difference across the different implants. The reasons for the revision and removal are in Table 3. The overall survival was 75% at 12 years (Table 4 and Figure 2).

Table 3*Indications for revision and removal*

Reason	No.	(%)
Aseptic loosening	15	53.6
Dislocation	9	32.1
Infection	3	10.7
Periprosthetic fractures	1	3.6
Total	28	100

Table 4
Life tables

Interval start time (months)	Number entering interval	Number withdrawing during interval	Number exposed to risk	Number of terminal events	Proportion terminating	Proportion surviving	Cumulative proportion surviving at end of interval
0	642	265	509.5	5	.01	.99	.99
12	372	81	331.5	2	.01	.99	.98
24	289	57	260.5	4	.02	.98	.97
36	228	52	202.0	2	.01	.99	.96
48	174	47	150.5	5	.03	.97	.93
60	122	28	108.0	4	.04	.96	.89
72	90	32	74.0	2	.03	.97	.87
84	56	18	47.0	2	.04	.96	.83
96	36	10	31.0	1	.03	.97	.81
108	25	19	15.5	1	.06	.94	.75
120	5	2	4.0	0	.00	1.00	.75
132	3	2	2.0	0	.00	1.00	.75
144	1	1	.5	0	.00	1.00	.75

Figure 2*Kaplan Meir table on the survival of the implants*

DISCUSSION

The overall survival of primary cemented total hip replacement implants in our setting is 75% at 12 years. This represents the early data from the commencement of arthroplasty surgery at the centre. To our knowledge, this is the first report of the survivorship in our region and serves as a benchmark for future studies. Our results are inferior to registry and single centre data that reports survival of 90-95% at 10-15 years (4). They are also inferior to reports from more developed centres in South Africa (5). The main reasons for revision or removal of an implant in our series were aseptic loosening and dislocations.

While there has been some controversy on the best mode of implant fixation to bone in hip arthroplasty with cementless fixation being advocated, majority of our patients underwent cemented surgery (6,7). The science of cementing implants in arthroplasty has developed over the years and many centres are now using relatively advanced techniques including pulsed lavage, vacuum mixing and use of cement guns (8). However, in Africa many centres including ours are still using the first generation techniques of cementing by hand. This may be a reason for the lower survival rates seen. As majority of healthcare costs in Kenya are out of pocket, the choice of implant will largely be determined by cost. The cemented implants are relatively cheaper and more commonly used in the country. Though the use of cementless implants is not necessarily associated with increased survival, cementless implants have a survival that is comparable to cemented implants especially when better cementing techniques are used (9). We contend that the use of cementless implants or better cementing techniques will improve survival of implants.

This paper reports the results of the early phase of our arthroplasty experience and it is likely that the high incidence of dislocations requiring revision or removal

may indicate the learning curve of the procedure. Our centre is not a specialised arthroplasty unit and neither is it a high volume centre. This may have had an impact in the rates of revision and complications as it has been found that high volume specialised centres fare better in both respects (10,11). Surgeons who perform fewer operations may be prone to more complications after hip arthroplasty (12). The level of experience of the surgeon may influence the outcome of surgery and may lead to a higher rate of revision (13, 14).

CONCLUSION

The twelve year survivorship of cemented implants in our region is 75% which is lower than in other regions. This data can be useful in preoperative counselling of patients. We recommend the establishment of dedicated arthroplasty centres in the region with the aim of increasing volumes and hence patient outcomes. Improving in cementing techniques and developing higher volume centres may result in improved outcomes.

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