



SHORT TERM ANALYSIS OF FUNCTIONAL RESULTS OF UNCEMENTED TOTAL HIP ARTHROPLASTY

Orthopaedics

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ABSTRACT

132 uncemented total hip arthroplasties (THA) were performed on 125 patients over 65 years of age; of which 102 arthroplasties, performed in 90 patients, were followed for at least 4 years. One revision was necessary following fracture of an acetabular component secondary to trauma. The post-operative Harris hip score (HHS) ranged from 87 to 99. Radiologically there were no signs of subsidence of more than 3 mm, nor of osteolysis. Five patients experienced thigh pain. Based on the clinical and radiological results, uncemented total hip arthroplasties can give satisfactory function in elderly patients

KEYWORDS

Total Hip Arthroplasties, Hip Joint.

INTRODUCTION

Although total joint replacement is indicated in younger people, especially those with multiple joint involvement from a systemic disorder such as rheumatoid arthritis / lupus erythematosus, the procedure generally is reserved for older individuals and those with relatively sedentary lifestyle. Pain in the hip joint is one of the most common causes in disabling human locomotion. Pain in the hip may be due to various causes like intraarticular fractures of hip or arthritic changes. There are many ways and methods by which the affected hip can be treated. This include analgesics, arthrodesis, excision arthroplasty, osteotomy and replacement arthroplasty. Total Hip Arthroplasty is the most commonly performed adult reconstructive hip procedure. Implanting an artificial femoral head and acetabular socket to replace the degenerated / destroyed hip joint will relieve the pain and provides pain free, mobile and stable joint. The total hip arthroplasty may be cemented or uncemented. Historically the long term results of cemented total hip arthroplasty show loosening which continues to be a basic complication. Thus, there has emerged the concept of biological fixation rather than fixation with methylmethacrylate. The overall results of press fitting alone were not good enough to consider as a sole method of fixation. With the advent of porous coated implants, which allow bone to penetrate the surface of the prosthesis and secure it, thus provide complete fixation and better results. Since it has been proved that the primary surgery stands the best chance of long term success, it should be done with utmost technical precision. Proper patient selection, implant selection and implantation are very essential for the successful outcome of the surgery. We have decided to study the short-term followup of functional results of porous coated uncemented total hip arthroplasty prospectively, done in our institution during last 3 years.

MATERIAL AND METHODS

The indication for the surgery must be reviewed first. The level of pain and disability, response to conservative therapy and desired life style must be considered. The general condition of the patient including his physical and mental status, general medical condition and ability to withstand the surgery must be considered. Physical examination should include spine and both upper and lower extremities including opposite hip, both knees and feet. Any limb length discrepancy and fixed deformities should be noted. Trendelenburg test to assess the abductor osseomuscular mechanism should be done. Aspirin and other anti-inflammatory drugs should be discontinued 7 to 10 days prior to surgery. Pyogenic lesions should be eradicated. PRE OPERATIVE RADIOGRAPHIC ASSESSMENT The goal of preoperative radiographic assessment is to confirm the diagnosis leading to surgical intervention, to determine the anatomic relationship of the femur and pelvis and to allow for accurate restoration of joint anatomy and biomechanics. For primary total hip arthroplasty of a routine nature, the most important x - rays are the standard pelvic roentgenogram AP view with both hips and the lateral view of the hip and proximal femur. Position of 41 hips in 15 degrees of internal rotation is essential to better delineate femoral geometry and offset. OTHER SPECIAL Studies That May Be Desirable Include The Following- X - rays of spine / knees, Oblique views of pelvis (in fracture-dislocations), Bone

Scans (Technetium, Gallium, Indium), CT scans (in revisions / CDH / # dislocation), PREOPERATIVE PLANNING -

The general goals are:

To determine the site and size of the implants, To restore the anatomic and bio - mechanical center of rotation of the hip joint. To restore any limb length discrepancy. To restore appropriate muscle relationship. To anticipate any problems likely to be met such as, deficiency of part of acetabulum requiring bone grafts or reinforcement rings along with plates and screws to fix the grafts, or the requirement of nonstandard sized implants (femoral). Preoperative planning should include the use of plastic overlay templates supplied by the prostheses manufacturers. Templating aids in 42 selection of the type of implant that will provide the best fit, implant size and neck length required to restore equal limb lengths and medial offset. X rays should be taken with magnification markers and the corresponding templates used. Draw line at the level of and parallel to the ischial tuberosities and intersecting the lesser trochanter on each side. Compare the 2 points of intersection and measure the difference to determine the amount of shortening. Now place the acetabular template that matches the contour of acetabular subchondral bone most closely at 45 degrees of abduction. The inferomedial margin is at the level of the teardrop with full coverage of the cup. Mark the centre of the acetabular component on the radiographs. This will correspond to the new centre of rotation of the hip. Place the femoral overlay templates on the film and select the size that most precisely matches the contour of the proximal canal and fills it most completely. Next, select the desired neck length to restore limb length and medial offset. If no shortening is present, then match the center of the head with the previously marked center of the acetabulum. If discrepancy exists, the distance between femoral head center and acetabulum centre should be equal to the previously measured limb length discrepancy. Once neck length is selected, mark the level of anticipated neck resection and measure the distance from the top of the lesser trochanter to use as a reference intraoperatively. Template the femur on the lateral view in a similar manner to assess whether the implant 43 determined on the anteroposterior film can be inserted without excessive bone reaming.

RESULTS

We have analysed the functional results of the porous-coated uncemented total hip arthroplasty, done in 31 hips of 29 patients. All patients were evaluated clinically and radiologically preoperatively and at various followup periods. All the patients were analysed using Harris Hip Score evaluation, preoperatively and post operatively. In our study, 15 hips showed excellent results, 10 hips showed good results, 3 hips showed fair results and 3 hips showed poor results. All the patients were analysed radiographically also during various follow up periods. The femoral stem and acetabular cup were assessed for its position, loosening, migration or implant failure.

DISCUSSION

In Kim et al., study, the preoperative hip score ranged from 12 to 74 with an average of 55, compared to the preoperative hip score ranging from 11 to 46, with an average of 24 in our study. The lesser preoperative Harris hip score in our study may be due to the fact that

Indian patients go in for Joint replacement surgery only after advanced changes in the joint. The mean age of the patients at surgery was 48.4 years (range, 19 to 69), compared to 34.7 years (range, 13 to 66) in our study. The common indications for the surgery were avascular necrosis of femoral head in 62 hips (47%), arthritis in 33 hips (25%) and fractures of neck of femur in 27 hips (21%). In our study, the common indications were following arthritis in 17 hips (58.6%), avascular necrosis in 6 hips (20.8%) and fractures of neck of femur in 4 hips (13.8%). 95 The mean clinical and radiological followup was 19.4 years (range, 18 to 20) compared to 20.3 months (range, 4 to 30 months) in our study. Since ours is a short term study, we have taken the 2 years followup results of Kim et al., study for the comparison and analysis of the results. After 2 years of followup of 128 hips, the results were excellent in 96 hips (75%), good in 24 hips (19%), fair in 8 hips (6%) and poor in none of the hips (0%), with the mean postoperative Harris hip score of 95 (range, 75 to 100). In our study, after 20.3 months of mean follow-up, the results were excellent in 15 hips (48.4%), good in 10 hips (32.2%), fair in 3 hips (9.7%) and poor in 3 hips (9.7%), with the mean post-operative Harris hip score of 87 (range, 65-98). The poor results in three patients in our study are due to malposition of the implant, migration of the implant and bilateral hip disease. After 19.4 years of follow-up (in Kim et al., study), the results were excellent in 64 hips (58%), good in 8 hips (7%), fair in 6 hips (6%) and poor in 32 hips (29%), with the mean hip score of 85 (range, 45 to 100). In most cases, this could be attributed to age - related deterioration in function. 96 In this study, 29 hips (22%) had childhood pyogenic or tuberculosis arthritis, and none was revised for infection. In our study, we had operated a case of tuberculous arthritis under anti-tuberculous chemotherapy cover, and no reactivation or infection was seen. Kim et al., (1987) treated 38 cases of tuberculous arthritis with total hip replacement with quiescent period ranging from 3 months to 45 years. Intraoperative culture was positive in 4 cases. No reactivation of disease was seen in these cases. He recommended anti - tuberculous chemotherapy for 3 weeks preoperatively and for 6 to 9 months postoperatively. Teak Rim Yoon, Sung Man Rowe, Iwan Budiwan Anwar and Jae Yoon Chung treated tuberculous hips with one stage total hip replacement and anti-tuberculous chemotherapy. No signs of reactivation was seen after mean followup of 3 years. Total hip arthroplasty appears to be a safe procedure for patients who have quiescent as well as active tuberculosis of the hip when there is no gross evidence of infection. With his study, Kim et al., suggested that uncemented acetabular components with polyethylene of better quality and a better capturing mechanism, or with alternative bearing surfaces such as ceramic - on - ceramic, may provide longer lasting results. 97 In our series, dislocation of the hip occurred in one case due to vertical placement of acetabular cup. It may be due to improper positioning of the patient and insufficient three-dimensional orientation of the surgeon. Migration of the acetabular cup medially occurred in one case due to poor bone stock with osteoporosis. One patient had subluxation of femoral head in the immediate postoperative period, probably due to abductor weakness. Although wear of the bearing surface continues to limit the long - term success rate of arthroplasty, there is a predictable long term stability of the bone implant interface achieved with cementless fixation.

CONCLUSION

The uncemented total hip arthroplasty is the best choice of surgery for hip diseases in younger individuals with good bone quality. The learning curve for the total hip arthroplasty to produce better results of this surgery is fairly big. The use of porous coated implants had better primary stability and also later with bone ingrowth, superior bond strength at the implant interface. This allows the porous coat to withstand loads which, in other systems, might result in a breakdown of surface coating. The bond strength and high coefficient of friction assure rigid, mechanical stability which is an essential factor for bone ingrowth. The preferred surgical approach is by lateral Hardinge approach and the position is supine position, especially for the surgeons in the learning curve, since the surgeon will have better three-dimensional orientation.

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