Total Hip Replacement in Avascular Necrosis of Femoral Head

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Abstract

Background: A study was conducted to evaluate the role of total hip replacement in cases of advanced avascular necrosis of the head of femur in patients admitted to two tertiary care military hospitals. 20 patients reporting with avascular necrosis of femoral head were taken for study.

Methods: Out of 20 patients, 16 were males and 4 were females. In 7 cases there was history of chronic alcohol intake and among them one patient was on steroids for long time for the treatment of bronchial asthma. 2 patients developed avascular necrosis of the femoral head following pregnancy and in two cases, it was post-traumatic. In the remaining nine cases, no cause was found and were so considered idiopathic. They were evaluated pre-operatively and total hip replacement was done in all twenty cases.

Results: Patients were evaluated using Harris hip score. There was improvement of the score in all cases.

Conclusion: Total hip replacement is a boon for patients of advanced avascular necrosis of femoral head.

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Key Words : Avascular necrosis; Total hip arthroplasty; Harris hip score

Introduction

The normal hip joint is subjected to many stresses during daily activities performed by an individual. Since it is one of the major weight bearing joints of the body, its normal function is necessary for peaceful and enjoyable day-to-day life. Avascular necrosis (AVN) of the femoral head is one of the common causes of painful hip in a young adult. The natural course of this disease is one of relentless progression with eventual collapse of the femoral head, followed by secondary osteoarthritic changes in the hip [1].

Once the diagnosis of AVN is confirmed, management varies depending upon the age of the patient, stage of the AVN, occupation & previous treatment received etc. Core decompression, bone grafting and valgus osteotomy can be considered in early stages and total hip arthroplasty in later stages of AVN of femoral head [2]. Arthrodesis can be considered in young vigorous patients with unilateral hip disease especially in males [3]. Excision arthroplasty which gives mobility at the cost of stability is also an alternative available. In advanced stages of disease, life may be rendered crippled and miserable. Total hip replacement has proved to be a boon for such patients.

The present study is a prospective study to evaluate the role of total hip replacement in cases with advanced AVN of head of femur.

Material and Methods

Twenty cases of advanced AVN of femoral heads (Ficat and Arlet stage III and IV) admitted at 2 tertiary care military hospitals and treated surgically by total hip arthroplasty between March 2000 and Feb 2002 were the subject of this study. Total hip arthroplasty was considered when the patients were unable to carry out the activities of daily living due to pain and conservative measures had failed to relieve the pain. Before advocating total hip arthroplasty conservative measures like reduction of weight, anti-inflammatory medication, reasonable restriction of activity and the use of cane while walking were advised. The inclusion criteria for this study were stage III and IV (Ficat and Arlet) AVN of femoral head with degenerative arthritis due to various etiological association of idiopathic type. Proper pre-operative assessment was done. In all cases, posterolateral approach was taken. Postoperatively limb was kept in abduction 30° over a pillow and drain removed after 48 hours. Patients were monitored clinically for any complications. Patients were ambulated on 6th postoperative day with walker and later with two and then one axillary crutch. The sutures were removed on 14th day and range of motion exercises were started. Patients were discharged after full rehabilitation at 6 weeks and by this time; they were able to walk with one stick in opposite hand. The Harris hip scoring system [4] was used to evaluate each hip pre-operatively and post-operatively. Pain and functional capacity were the two main variables considered for making a decision about surgery. Rating of 90 to 100 points was considered excellent; 80 to 89 good; 70 to 79 fair and less than 70 poor.

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Results

In this study, the minimum age was 26 years and the maximum 68 years and the majority of patients were between 31-40 years (45%) and 41-50 years (25%). This age group has the causes as idiopathic or related to alcohol or steroid intake. AVN of the femoral head is common in young individuals. Out of 20 patients, 16 were males and four were females. The overall male to female ratio was 4:1. Out of the four female cases, two patients developed avascular necrosis of femoral head following pregnancy and both had bilateral hip involvement. Out of 20 patients in this series, 7 (35%) had bilateral involvement of hip joint. Of these 7 patients, 5 had bilateral total hip replacement. The remaining 13 patients (65%) had unilateral hip involvement. Of the 20 cases of AVN of head of the femur, there were 7 cases where there was history of chronic alcohol intake and among them one patient was on steroids for a long time for the treatment of bronchial asthma. In two cases, it was post-traumatic, out of which one was treated by internal fixation for intra-capsular fracture of neck of femur. Two patients developed AVN of the femoral head following pregnancy. In the remaining nine cases, no cause was found (idiopathic). Out of these, five cases had bilateral involvement.

The overall preoperative Harris hip score was 43, which remarkably improved to 89 postoperatively. The results observed, showed that all patients had good to excellent results, (Harris hip score ≥ 80) thus showing a good degree of pain relief, improvement in function and range of motion. The most important improvement was seen with regard to pain, with all the twenty patient attaining a pain score of 44 (complete relief of pain) after six months of surgery.

We had our share of complications. Of the twenty patients in this series, one patient had limb length discrepancy of 1.5cm shortening (operated side) for which a compensatory shoe raise was given. One patient had posterior dislocation on the 15th postoperative day due to unguarded physiotherapy. Another patient had delayed wound healing. There was past history of alcoholism and steroid intake for bronchial asthma in this patient.

Fig. 1 : Bilateral AVN femoral head - pre-operative

Discussion

In this study, 20 cases of advanced AVN of the femoral head (Ficat and Arlet stage III and IV) were treated by primary total hip arthroplasty. The study was undertaken to know the vital role of total hip replacement in AVN of head of the femur. AVN of head of femur forms one of the major indications for total hip replacement. Between 5-12% of the total hip replacements are performed in patients who have AVN of femoral head [5]. The optimum treatment of patients with collapse of the femoral head and significant pain is controversial. Osteotomies, which transfer healthy surface areas of the femoral head for weight bearing, are a viable treatment option, but the results can be inconsistent. Arthrodesis may be considered for unilateral disease, but it has a limited role since the incidence of bilaterality in non-traumatic AVN has been reported to range from 40-70% cases [6]. The results of bipolar arthroplasties in AVN of the femoral head were inferior to those of total hip arthroplasty. Total hip arthroplasty is the only predictable effective treatment of AVN of the femoral head when the disease process has reached Ficat and Arlet stages III and IV [7,8].

According to J.P.Garino and M.E.Steinberg [6], using modern cement techniques and components, total hip arthroplasty can give excellent results in young patients with AVN and may be the treatment of choice when reconstructive surgery is required. Although wear of the bearing surface continues to limit the long term success rate, cementless total hip arthroplasty remains a reasonable treatment option for advanced osteonecrosis of the femoral head.

Conclusion

Total hip replacement, since its advent, has immensely decreased the sufferings of mankind, who was rendered unhappy and crippled due to variety of hip diseases.

Fig. 2 : Bilateral AVN femoral head - post-operative cemented THR

Fig. 3 : AVN femoral head in young - pre-operative

It has brought back the joy to human life, may they be younger or older patients. Previously it was thought that only older people should be considered for total hip replacement, but current trends and studies show that younger age groups are equally benefited though there are some problems. Although the use of total hip arthroplasty in young patients will more likely necessitate future reconstruction, the consistent relief of pain and good functional results have made this procedure an attractive treatment choice for the debilitating arthritis resulting from osteonecrosis of the femoral head [9]. The present study included twenty cases of advanced AVN of femoral head. The patients were crippled due to pain, inability to carry out day-to-day activities, loss of movements and deformities of the hip joints. After total hip replacement, patients have shown significant improvement in the range of motion of joint and relief from pain and deformities [10]. Most of the patients have resumed their jobs and are satisfied. Our study stresses the fact that total hip arthroplasty is a boon for patients of advanced AVN of femoral head, as life is movement and movement is life.

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Fig. 4 : AVN femoral head in young - pre-operative hybrid total hip replacement

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