



A case series of total hip replacements for patients with Paget's disease

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The aim of this case series is to determine rates of revision in patients with Paget's disease undergoing total hip. replacements. Patients presenting to a single with Paget's disease of the femur or acetabulum undergoing total hip arthroplasty. Retrospective case note and radiographic review was undertaken. 32 patients with a mean age 77.4 (range 68-88). 12 males and 20 females. There were 25 cemented total hip replacements, 1 hybrid and 6 uncemented total hip replacements performed. The mean drop in haemoglobin was 33.3g/L (8-59). 14 (43.8%) received a blood transfusion. There were no deaths in the first year following surgery. 1 (3.1%) revision procedure was performed in the first year. At 5 year follow-up there were no further revisions in the 27 patients with 5 year followup (96.3% survivorship). Total hip replacement in patients with Paget's disease has low complication rates and low risks of revision.

Keywords : Pagets ; hip arthroplast.

INTRODUCTION

Paget's disease is disease of abnormal bone remodelling initially described in 1877 (4). There is increased bone formation and resorption leading to altered bony architecture. It effects up to 4% in those older than 45 years (6).

Patients with Paget's disease cause operative challenges in total hip replacements due to the disorganised bony architecture. The increased vascular supply increase the risk of blood loss and risk of transfusion.

There is a paucity of literature regarding outcomes in patients undergoing total hip replacements with Paget's disease, and whether cemented or cementless hip replacements have the best outcomes and lowest complications.

The aim of this case series is to determine rates of revision in patients with Paget's disease undergoing total hip replacements. Our secondary outcomes were complications, transfusion rates, drop in haemoglobin and length of stay.

METHODS

Patients were included who presented to a single centre between 1998 and 2014.

Inclusion criteria were patients with Paget's disease of the femur or acetabulum undergoing total hip arthroplasty. Patients were excluded if the reason for hip replacement was not Paget's disease. There were no other exclusion criteria.

Patients were identified from the hospital records using the ICD codes for total hip replacement and Paget's disease. Those with both codes then

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had radiographs reviewed to confirm Paget's was present in the affected joint in either the femur or acetabulum. Those that matched the criteria had their case notes reviewed to confirm the diagnosis of Paget's was the indication for total hip replacement.

Patients notes were reviewed for medical co-morbidities and pre-operative medications for Paget's disease.

Operation notes were reviewed for details of the operation performed. This included the implants used in surgery, bearing surfaces, the use of cement and intra-operative complications. Length of stay was recorded using discharge summaries. The notes were reviewed for complications and for evidence of revision surgery.

Hospital blood results pre and post-operative were recorded from hospital records.

Statistical analysis was undertaken using minitab version 17, with the Mann Whitney test used for parametric data and the Chi Square test used for non-parametric data.

RESULTS

32 patients met the inclusion criteria. The mean age was mean age 77.4 (range 68-88) and there were 12 males and 20 females.

30 of the patients had radiographic changes of Paget's disease in both the femur and acetabulum. 2 patients had changes in the femur only.

Pre-operatively 12 patients (37.5%) were on non-steroidal anti-inflammatory drugs, 0 were on calcitonin and 8 patients (25%) were on bisphosphonates.

There were 25 cemented total hip replacements, 1 hybrid and 6 uncemented total hip replacements performed.

The cemented acetabular implants used were: 15 Exeter Contemporary cups, 10 Charnley and Elite Ogee. Uncemented Trident acetabular components were used in 7 patients. The cemented femoral stems used were 16 Exeter, 9 Zimmer CPT, and 1 DePuy Charnley. Uncemented Accolade stems were used in 6 patients.

30 of the 32 patients had metal on polyethylene bearings and 2 had ceramic on polyethylene.

The mean drop in haemoglobin was 33.3g/L (8-59). Of the 32 patients, 14 (43.8%) patients received a blood transfusion.

In the patients that underwent cemented hip arthroplasty the mean age was 77.6 and 75.8 in the uncemented group ($p=0.5687$). The mean length of stay was 8.0 days (4-15) in the cemented group and 7.0 (4-12) in the uncemented group ($p=0.5093$). Mean drop in Hb was 32.7g/L in the cemented group and 33.8 g/L in the uncemented group ($p=0.7263$). Blood transfusion was required 10 of the 25 (40%) that underwent cemented arthroplasty and 3 of the 6 (50%) patients that underwent cemented arthroplasty ($p=0.6558$).

One of the two patients that had just femoral involvement had a hybrid hip replacement and 1 had a uncemented hip replacement.

There were no deaths in the first year following surgery. 1 (3.1%) revision procedure was performed in the first year. At 5 year follow-up there were no further revisions in the 27 patients with 5 year follow-up (96.3% survivorship). The patient that underwent revision surgery had an uncemented total hip replacement. This required revision surgery for an unstable implant. There were no revisions in patients who underwent cemented total hip replacements.

8 (25%) of patients developed heterotopic ossification, but no patients underwent further treatment.

DISCUSSION

Paget's disease occurs in up to 4% of those aged over 45 (6). Many of these patients go on to develop arthritic pain. The treatment of these patients is the same as those with degenerative osteoarthritis and total hip replacements are therefore undertaken regularly in these patients.

Patients with Paget's disease present many operative challenges (6). The disorganised bone architecture can lead to extremely dense bone which results in challenges with canal preparation and potential difficulties with integration of uncemented implants. Previous studies have found good stem integration with uncemented implants despite these concerns (5,7). A further concern

is the increased blood flow to the bone and the potential for increased blood loss and transfusion requirements.

There are limited studies determining the implants that gives the best outcomes in patients with Paget's disease. It was for this reason that this retrospective case series was undertaken.

This study included mainly cemented implants and none of these underwent revision surgery. Other studies that have assessed cemented implants have found similarly good results. Ludkowski et al reviewed 37 patients who underwent arthroplasty with a Charnley hip replacement. They demonstrated an overall good or excellent outcome in 70% of patients at an average follow-up at 7.8 years. There were no revisions and no instances of post-operative dislocation. They noted intra-operative difficulties in 9 patients (1). Sochart again investigated Charnley total hip arthroplasty in 98 hips in 76 patients with Paget's disease. They found 10% of acetabular and 8% of femoral implants had loosened aseptically. Despite the aseptic loosening, they still demonstrated survivorship of 98% at 10 years and 91% at 15 years for the acetabular component and 93% and 89% for the femur. They demonstrated an average blood loss of 388mls (7).

McDonald et al found the incidence of revision due to aseptic loosening of 15% at 10 years. They found this to be statistically significant compared to other patients undergoing arthroplasty. They found overall good or excellent results in 74% of patients (3).

Others studies have assessed uncemented arthroplasty. In a study by Lusty et al 33 cementless THRs were performed. 3 underwent revisions within 6.7 years. They found the Harris hip score improved from 56/100 preoperatively to 90/100 postoperatively. They concluded that it was safe to undertake uncemented hip replacements in patients with Paget's disease (2).

Parvizi et al reviewed 19 hips in 18 patients with an uncemented component into either the acetabular or femoral component with Pagetic changes. They demonstrated improvement in Harris Hip scores and radiographic evidence of bone ingrowth in all patients. They did find that surgery was technically demanding because of sclerotic bone and there was

excessive bleeding with an average blood loss of 996 ml (5).

These studies all highlight that total hip replacement is a successful operation for those with Paget's disease. Both uncemented and cemented implants have good results with revision rates only slightly higher than the general population. This study did not find a significant difference between cemented and uncemented implants which may be due to the small numbers in the series. Our current practice is to recommend cemented implants, as none of the cemented patients in this series required revision surgery.

From the current literature the concern about high blood loss in these patients is well founded with previous studies reporting average blood loss between 388mls and 996mls (5,7). This study found a transfusion rate of 43.8%. All possible measures should be undertaken to pre-operatively optimise the patient's haemoglobin and prevent intra-operative blood loss. The use of cell salvage should be considered.

A further concern is the incidence of heterotopic ossification. Previous studies have stated incidences of up to 32%, but few requiring additional surgical procedures (5,7). This study found a similar incidence of heterotopic ossification and no patients required further treatment. Further studies are required to assess whether prophylaxis reduces the rate of heterotopic ossification and improves functional outcomes.

In this retrospective study there may be a bias in the selection of patients receiving cemented or uncemented implants, with potentially older more frail patients receiving cemented stems. Patient reported outcome data would have been beneficial but this was incomplete due to the retrospective nature of this study. The relatively small sample size makes it difficult to draw strong valid conclusions but this has also been the case with other previous similar studies.

This study adds to the limited current literature on total hip replacements in patients with Paget's disease. Further multi-centred long-term studies with patient reported outcomes are required to determine the best operative treatment for these patients.

In this case series total hip replacement is a successful procedure in patients with Paget's disease with overall low complications and low risk of failure. Consideration should be given to optimising the patient blood count pre-operatively due to the high risk of transfusions.

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Figure 1. – Allograft preparation by applying appropriate tension and placement of nonabsorbable sutures.