Introduction

Resurfacing is increasingly becoming a popular option for treating hip arthritis in young patients. In UK, hip resurfacing comprises 8% of primary hip arthroplasty. Excellent results and survival have been reported in literature. Advantage of hip resurfacing is ease of revision. Usually failure is on the femoral side. Early results of femoral component revision are shown to be comparable to primary hip replacement. Other causes of failure may indicate revision of acetabular component or of both components. Objective of this study is to evaluate function of patients after revision of acetabular component of hip resurfacing. Functions of patients who had acetabulum or both components revised were analysed. This is the largest report of failures following single implant hip resurfacing involving multiple surgeons and centres.

Methods

Between July 1997 and November 2002, the Oswestry Outcome Centre (OCC) independently and prospectively collected data on 5000 Birmingham Hip Resurfacings (BHRs) performed by 141 surgeons, at 84 hospitals. Postal questionnaires comprising Harris and Merle scores were sent to all patients at six months after their surgery and annually for the first five years thereafter. Further questionnaires were performed at seven and ten years after surgery. When a revision had taken place, the OCC contacted the operating surgeon to ascertain the mode of failure and the type of revision implant used. Of the original 5000 BHRs, to date 4521 implants have survived with median Harris hip score is 96 at average of 7.13 years. Hip scores were compared between single component (acetabular and femoral) and both components revision group. Mann Whitney test was used to analyse non parametric and student t test for parametric data. p value < 0.05 was considered significant. Fisher exact test used for comparison between male and female in revised and surviving group.

Results

182 hip revisions (3.6%) in 181 patients, data for 124 patients are complete for further analysis. Femoral revision 51.61%, Acetabular revision 11.29% and both components revised in 37.09%. There was significant difference in hip scores between surviving BHRs and revised hips. For this study patients having acetabular revision alone or as part of complete revision are analysed.

Acetabular revision

14 patients had isolated acetabular revision. 10 were females and 4 males. Average age was 48.7 years. 11 hips were revised for loosening of acetabulum, 2 for malposition and 1 dislocation. 1 patient died 6 years after revision. Mean time to failure due to loosening was 1.34 years. 55 % of loose cups survived less than year. 3 hips were re-revised due to fracture and 2 due to dislocation. These were excluded from further analysis. Median hip score of rest of the hips is 74 (IQR 63-96) at average 4.49 years (IQR 2.87-6.59). Median Merle score is 14 (IQR 10-17). There was no significant difference between the sizes of the components in females and males.

Both components

46 patients had both components revised. 33 were females and 13 males. Average age was 58 years. Causes of failure were infection in 12 hips, loosening cup in 13, fracture in 8, pain/metallosis in 8, dislocation 2, malposition of cup, loosening head and both components loosening in 1 each. 2 patients died. 2 hips were re-revised for infection and 1 for dislocation. These were excluded from further analysis. 8 had cemented, 11 hybrid and 12 uncemented revisions. Prosthesis used in 13 cases is unknown. Median hip score was 88 (IQR 97-66.5) at average 4.07 years (IQR 6.5-14). Median Merle score is 15 (IQR 12-18). There was significant difference between sizes of components between males and females. There were 64 femoral revisions with median hip score of rest of the hips was 84 at average of 3.8 years. There is no significant difference in function between acetabular, femoral and both components revision, p>0.05.

Discussion

Our results show 95% survival of BHR at 10 years. Revisions were predominantly femoral 51.61%. Isolated acetabular revision accounted for 11.29% and both components were revised in 37.09%. Median hip score after acetabular revision was 74 and 88, after revision of both components. There was no statistical difference between both groups. This study shows significant reduction in hip scores after revision of BHR. This is expected as this involves further exploration of hip, removal of components which may be well fixed and insult to soft tissues.

One of the advantages of hip resurfacing is ease of revision when need may arise. This is true in most of the cases as usual mode of failure is femoral and only single component need to be revised. Although both component revisions are more complex, our study does not show significant difference in result between single component and both component revisions. This may be due to the fact that most patients are young and therefore have high hip scores. Ball et al examined 21 failed hips resurfacing revised to total hip replacement (THR), showed similar outcomes as primary THR at average follow up of 3.8 years. All cases of failure were on femoral side. Grammatopolous et al showed 49 (3.6%) failure in 1375, four different primary resurfacings at mean follow up of 3 years. They showed comparable result of revision following failed hip resurfacing to primary THR for all reasons, except for failure due to pseudo tumour. 20 patients had femoral revision and rest had both components revised. No patient had isolated acetabular revision. 30% cause of failure was attributed to pseudo tumour formation.

Ollivere et al analysed 13 failures (2.8%) in 463, Birmingham primary resurfacings. Female gender is described as on of the risk for failure of hip resurfacing, may be due to association with small size components leading to more wear. It was postulated that wear was related to metallosis and failure. Failed hips showed evidence of metallosis in 70% of cases. They showed significant difference in sizes in failed and surviving group. There was no comment on function of revised hips.

In our study both groups showed predominance of females and there was significant difference between the head diameter between males and females in the revised group. Our study lack in similar number of failures attributed to metallosis. Relationship between metallosis, aseptic lymphocytic vasculitis associated lesion (ALVAL) and pseudotumors is controversial. Evidence of metallosis in failed hips may not necessarily be causal. Out of 24 isolated loose cups 8 had survival less than 1 year average 0.31 years. This may indicate failure of in growth due to lack of adequate primary stability. This may represent technical challenge in performing hip resurfacing. There is a learning curve associated with hip resurfacing as procedure is more complex than THR.

There is some concern regarding amount of bone reamed to implant acetabulum in resurfacings. Revision of the acetabulum can lead to further bone loss. Our study showed average change in size of 3.36mm in the outer diameter of acetabular component which is comparable with published figures.

In conclusion hip resurfacing has good midterm outcome. Failure is more common in females. Revision of acetabular or both components has similar functional outcome. Further study is needed to investigate reasons for high failure rate in females.