Short-term results of total hip replacements performed by visiting surgeons at an NHS treatment centre

Between December 2004 and June 2006, 136 patients (156 total hip replacements), were sent from the waiting list of the Cardiff Vale NHS Trust to the NHS Treatment Centre, Weston-super-Mare, in an attempt to reduce the waiting time for total hip replacement. Because of concerns about their outcome, each patient was contacted and invited to attend a review appointment with a consultant specialising in hip and revision hip replacement.

A total of 98 patients (113 hips) were reviewed after a mean of 23 months (11 to 30). There were 104 cemented hips, seven hybrid and two cementless. An acetabular inclination of > 55° was seen in 18 (16%). Radiolucent lines around the acetabular component were seen in 76 (67%). The femoral component was in more than 4° of varus in 47 (42%). The medial floor had been breached in 13 (12%) and there was a leg-length discrepancy of more than 1 cm in ten (9%). There were three dislocations, one femoral fracture, one pulmonary embolus, one deep infection and two superficial wound infections.

To date, 13% (15 hips) have been revised and a further 4% (five hips) await revision, mostly for a painful loose acetabular component. The revision rate far exceeds the 0.5% five-year failure rate reported in the Swedish Registry for the components used. This initiative and the consequent need for correction of the problems created, has significantly increased the workload of our unit.

Between 2004 and 2006, in an attempt to reduce the waiting time for patients listed for total hip or knee replacement (THR/TKR) at the Cardiff and Vale NHS Trust, a contract was arranged by the Welsh Assembly Government whereby patients would be sent to alternative providers in England and Wales. This was known as the ‘Second Offer Scheme’. As a result, patients were invited to receive treatment at the NHS Treatment Centre in Weston-super-Mare at an earlier date than could be offered in Cardiff. The initial target was that no patient should wait longer than 18 months from their first outpatient appointment in March 2004, and that this should be reduced to 12 months by March 2007. After a higher than expected number of complications from the 258 TKRs performed at that unit,1 a fact initially highlighted by a British Orthopaedic Association enquiry, the Welsh Assembly ordered a review of all patients who had undergone a TKR or a THR there under the scheme.

Patients and Methods

Between December 2004 and June 2006, 156 THRs (136 patients) were carried out by seven visiting surgeons at the NHS Treatment Centre, Weston-super-Mare, after transfer from the waiting list of the Cardiff and Vale NHS Trust. The contract involved only surgeons supplied by Scanloc Medical Recruitment (Scanloc, Battle, United Kingdom), and the substantive consultants based at the trust were not involved in any aspect of the management of these patients.

For this review, patients were contacted by post and telephone and offered a clinical and radiological review appointment at Cardiff and Vale NHS Trust with a consultant orthopaedic surgeon specialising in hip replacement and revision hip surgery. An accompanying letter was sent from the Medical Director which explained that there had been some concerns about the quality of the surgery in a small group of patients, and that, as a precaution, all patients who had undergone surgery at the unit were being invited to attend for review. Patients who declined an appointment were sent a postal questionnaire to find out whether they had undergone further surgery. An Oxford hip score2 was recorded when the patient was reviewed or sent postally by those who declined an appointment. Standardised anteroposterior radiographs of the pelvis and a lateral view of the replaced hip were obtained.

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Further investigation and follow-up appointments were organised as necessary.

The position of the acetabular and femoral components was analysed using IMPAX software (Agfa-Gevaert NV, Mortsel, Belgium). Varus or valgus alignment of the femoral component was defined as 4° or more of deviation from the anatomical axis of the femur. Acetabular radiolucencies were classified by the DeLee and Charnley zones.3 We also looked for evidence of breach of the medial floor; excess cement visualised in the joint or protruding from the flange of the cup, on the lateral flange of the acetabular component, or beneath the transverse ligament; radiological evidence of detachment of the greater trochanter; the quality of cementation of the femoral component (Barrack grade);4 any radiolucenties in Gruen zones 1 to 7;5 leg-length inequality as measured from the teardrop to the lesser trochanter; heterotopic ossification (Brooker classification);6 and any evidence of internal fixation suggesting an intra-operative fracture. Patients who reported pain and had radiolucencies in all three acetabular zones were investigated with three-phase isotope bone scintigraphy. Patients with pain and a history suggestive of wound healing complications were investigated with blood tests for inflammatory markers, followed by an aspiration arthrogram if necessary. Patients in whom abductor dysfunction was suspected were investigated with a CT scan.

**Results**

A total of 98 patients (113 hip replacements) attended for clinical and radiological review, and 36 patients (40 hips) declined. The two other patients (three hips) had died from unrelated causes. There were 65 women and 33 men, with a mean age at surgery of 69 years (42 to 88). The mean time to follow-up was 23 months (11 to 30). A cemented THR had been performed in 104 hips, a hybrid in seven and cementless in two. The Exeter femoral component (Stryker Howmedica, Kalamazoo, Michigan) was used in 111 hips and the SL-Plus cementless femoral component (Plus Orthopaedics, AG, Rotkreuz, Switzerland) in two. A cemented acetabular component (Senator, Corin PLC, Cirencester, United Kingdom) was used in 104 hips and a cementless acetabular component (EP Fit, Plus Orthopaedics AG) in nine.

The mean Oxford hip score for those who attended for review was 30 (12 to 60), and for those that declined, 17 (12 to 37).

The mean acetabular inclination was 47° (30° to 66°). There were 18 hips (16%) with an acetabular inclination of > 55°. Radiolucent lines were seen around the acetabular component in zone I in 36 hips (32%), in zones I and II in nine hips (8%) and in all three zones in 31 hips (27%). The 24 hips with pain and radiolucencies in all three zones were referred for bone scintigraphy. Of these, 17 had an appearance consistent with loosening of the acetabular component. The femoral component was in more than 4° of varus (4° to 7°) in 47 hips (42%) on the AP radiograph. On the lateral view, it was central in 112 hips. The quality of femoral cementation was graded as A in 54 hips (48%), B in 42 hips (37%), and C in 15 hips (13%). Radiolucent lines were seen at the femoral bone-cement interface in three hips (3%).

There was evidence of trochanteric detachment in three hips. Heterotopic ossification was graded as I in 16 hips (14%), II in seven hips (6%), and III in one hip (1%). A breach in the medial wall of the acetabulum was seen in 13 hips (12%).

There was excess cement beneath the transverse ligament in 15 hips and radiological evidence of intra-articular cement in the joint in nine. There was excess lateral cement, presumed to be left on the flange of the acetabular compo-
nant, in five hips. A leg-length discrepancy of > 1 cm was seen in ten hips (9%). Figures 1 and 2 demonstrate some of the radiological features noted.

Three hips dislocated post-operatively; two were treated by closed reduction and an abduction brace for six weeks and did not dislocate again. The third was treated by excision arthroplasty by the same surgical team two months after the original THR. We subsequently re-implanted a THR with a constrained acetabular component.

There was one intra-operative distal femoral fracture which occurred at the time of surgical dislocation of the native hip. This was treated by open reduction and internal fixation at the treatment centre, and the hip was replaced by the same team four months later.

There was one pulmonary embolus during the post-operative recovery period, and two superficial infections which were treated with antibiotics. There was one deep infection proved by aspiration arthrography and subsequent culture of micro-organisms. One patient had a CT-proved abductor detachment.

From a reviewed group of 113 hips, 15 (13.3%) have been revised at our hospital. The indication for revision and the components revised are shown in Table I. Revision has been recommended in a further five cases for loosening of the cemented acetabular component, but this has been deferred at the patient’s request because of the proximity to the index operation.

One patient who declined review had already undergone revision at another hospital. The details of this case are unknown to us. Overall, 55% stated that they would be happy to receive treatment at the same unit again. Of those who accepted a review appointment with us, the rate was 43%.

**Discussion**

Numerous strategies have been implemented in an effort to reduce waiting times for orthopaedic procedures, and sourcing of additional capacity in the NHS, private and independent sectors remains a key government strategy throughout the United Kingdom. The Treatment Centre Programme aimed to help provide the extra clinical capacity needed to deliver swift access to treatment for NHS patients; spearhead diversity and choice in clinical services for NHS patients; and stimulate innovative models of service delivery and drive up productivity.

At the time of this study there were 44 active NHS-run Treatment Centres, and between April 2003 and the end of the financial year 2005/2006 over 304,000 patients have been treated. There were also 23 Independent Sector Treatment centres providing additional capacity. Because of the ‘additionality clause’ which applied to the first wave of independent sector treatment centres, surgical staff were usually sourced from abroad. This clause precluded substantive NHS consultants from working at independent treatment centres. NHS treatment centres, however, were able to source staff from both home and abroad.

Under the Second Offer Scheme, the Welsh Assembly purchased additional capacity at the NHS treatment centre, Weston-super-Mare, which was staffed by visiting orthopaedic consultants on six-week attachments. The contract ended in 2006. Had the funding from the Welsh Assembly not enabled them to be seen for this review, most patients seen by us would have had no further follow-up.

A report of an earlier initiative to reduce waiting-list times highlighted the high complication rate among patients sent for THR to other centres within the United Kingdom. Overall, 44% required revision surgery after a mean of 6.5 years. Complications presented late due to a lack of follow-up and required more complex surgery. The issue of delegating surgery to practitioners who are not accountable for their results or complications was discussed. The British Orthopaedic Association continues to be concerned about clinical outcomes in certain areas of the country, and about the selection of surgeons in some centres.
Early complications of THR do occur, but are infrequent. The Swedish Hip Registry reports re-operation within two years, a similar time period to this study, in 1.4% of patients. The re-operation rate for aseptic loosening was 0.1%.10 In our study, there was a re-operation rate of 16% within two years.

The implants used in this group of patients have a good record of reliability and the high failure rate cannot be blamed on the choice of implant. The Exeter femoral component has a 94% to 98% ten-year survival rate11,14 and a 10A Orthopaedic Data Evaluation Panel rating.15 The Swedish Registry reports a 99.5% five-year survival rate for the Exeter femoral component when combined with the Cenator acetabular component. The Cenator component in isolation has a shorter term follow-up but has a 3A Orthopaedic Data Evaluation Panel rating.15 Similarly poor outcomes with a high rate of early revision have been reported for the Kinemax TKR performed by the same group of surgeons in patients transferred from the Cardiff and Vale waiting list.1

Although a proportion of the femoral components were implanted in varus with a thin cement mantle in Gruen zone 1, the standard of implantation of the femoral component was, on the whole, reasonable. Its position on the lateral radiograph was satisfactory in 99% of cases. However, the standard of cementation of the acetabular component was poor. There was often a scanty cement mantle, with poor cementation in zone 1. Radiolucencies were frequent. The rate of breaching of the medial wall seems high, and there was frequently excess cement around the joint or beneath the transverse ligament. It has been suggested that the appearance of any line of demarcation on the immediate postoperative radiograph must be considered to be due to poor surgical technique.16 The appearance of even minor demarcation in the first year after surgery results in 33% to 40% radiological loosening by ten years.17,18 Ritter et al19 reported a 38.8 times increase in failure rate for the acetabular component if a lucent line is present in zone I at one year. The lack of availability of the early post-operative radiographs means that we cannot be certain whether the lucencies were present from day one or not. It would, however, be surprising if radiolucencies had developed around well-fixed components by the time of this study, given their satisfactory performance in other series. We must therefore assume that these components were loose from the time of implantation as a result of poor cementing technique. In all, 76 hips (67%) had a radiolucent line in zone 1. These hips are being monitored on an annual basis, as they may fail at an early stage.

There are cost implications inherent in following up this cohort of patients. The burden of performing bone scans in almost 21% of those patients within the first two years is significant both in terms of cost and additional workload to the radiology department. Plain radiography has been shown to have a sensitivity and specificity of 85% in detecting aseptic loosening of the acetabular component.20 However, given the lack of availability of early post-operative radiographs, the short time since implantation and the potential for litigation, we decided to obtain a bone scan for any patient who had a painful hip and radiolucencies in all three zones to provide further objective evidence to support our decision to revise.

The decision to send patients to alternative providers has left a higher than expected number needing further surgery, with its attendant risks. What started as an initiative to reduce waiting times in our Trust has resulted in an increased burden of revision surgery, which affects our ability to meet current targets.

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

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