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ORIGINAL STUDY

The impact of posterior approach for total hip arthroplasty on early complications

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The optimal approach for total hip arthroplasty is hotly debated. We analysed 121 consecutive patients who underwent primary total hip arthroplasty during the first three years of practice of a newly appointed consultant. Patients were analysed for pain scores (1-6), function scores (1-6) and satisfaction levels (1-5). All complications, during and after surgery, were noted with special emphasis on incidence of dislocation and factors contributing to it.

The results were gratifying and were comparable with major series of total hip replacement via the posterior approach. No patient had a dislocation. One hundred and five patients (89%) had no or minimal pain after the surgery. Eighty-six patients (73%) were mobilising without a stick. There were no major intra-operative complications and most (84%) patients rated the operation 'very good' at one year follow-up.

We conclude that the posterior approach, already known to cause less blood loss and optimum component positioning, is compatible with a low overall rate of early complications especially dislocation.

Keywords : total hip arthroplasty ; posterior approach ; complications.

INTRODUCTION

Total hip arthroplasty (THA) has emerged as one of the major breakthroughs in modern day orthopaedics (*20*). The optimal surgical approach is still keenly debated (*14,15,19*). Many surgeons, especially the newly trained, have been wary of the posterior approach because of higher reported rates of dislocation (*15,19*). In recent years, there has also been an increase in concern over patients with less favourable outcomes, during the surgical 'learning curves' of newly trained orthopaedic surgeons (*1,10,20*). This may be exacerbated by the curtailment of time spent in patient care during higher surgical training in the United Kingdom (*2*). We reviewed the outcome of patients with primary total hip arthroplasty performed by the posterior approach during the initial years of practice of a newly appointed consultant.

MATERIALS AND METHODS

One hundred and twenty one consecutive patients undergoing primary total hip replacement were analysed. These spanned the initial three years (February 2001 to February 2004) in surgical practice of

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a newly appointed Consultant with a fellowship in hip arthroplasty.

Most of the patients (118) presented with primary osteoarthritis of the hip while three had rheumatoid arthritis. There were 49 men and 72 women with an average age of 68.9 years (range 37-87 years) and 71.5 years (range 54-90 years) respectively. The average age of all the patients was 70.4 years (range 37-90 years). The right hip was more commonly involved with a ratio of 1.4:1. The youngest man in our study had rheumatoid arthritis with severe pain and disability. He was therefore operated upon at 37 years of age.

There were 103 cemented hip replacements, 10 cementless hip replacements and eight hybrid hip replacements (cementless acetabular component and a cemented femoral stem) in this series. The most common implant size for the femur head was 26 mm (in 70 patients), followed by 22 mm and 28 mm in 39 and 12 patients respectively. Ultra high molecular weight polyethylene formed the acetabulum cup/liner in all cases.

All operations were performed using a posterior approach either by the senior author or under his direct supervision. While dissecting, the tendon of piriformis and obturator internus were held with two '1' vicryl stay sutures and then released from the posterior margin of the greater trochanter along with the two gemelli. Next, a U-shaped posterior capsular flap based on the acetabular attachment was raised and held by '5' Ti-cron stay suture. The dislocation was completed by flexion and internal rotation of the femur. After insertion of the total joint replacement components, the hip was held in 15° internal rotation to allow the posterior capsular flap and short external rotators to approximate the greater trochanter, while they were reattached with stay sutures through two 2.0 mm drill holes (*18,24*). The average time of operation from the incision to closure was 80.4 minutes (range 48 to 130 minutes).

Post operatively, all patients underwent a dedicated rehabilitation program and were mobilised on day 1 or 2 under the supervision of a trained physiotherapist. The patients were instructed to use a raised toilet seat and avoid flexion of more than 90 degrees, adduction and internal rotation while the hip was in flexion. The occupational therapy team helped in assisting patients with activities of daily living and making appropriate amendments at home before discharge. A standard antero-posterior radiograph of the pelvis and cross table lateral radiograph of the operated hip were performed before discharge and compared with radiographs taken at each follow-up.

The data was collected prospectively at the time of operation, at 3 and 12 months from the operation. Patients were grouped into Charnley disability grade (4) depending on the involvement of one hip (Grade A), both hips (Grade B) and involvement of multiple joints (Grade C). There were 46, 30 and 45 patients each in Grades A, B and C respectively. Radiographs taken immediately after the operation and at 3 months were studied for the position of the cup and stem and condition of the proximal medial cement, where applicable (table I). The anteversion and retroversion of the cup was measured by the method similar to that used by Fabeck *et al* (8). Further, at 12 months the radiographic changes in the acetabular and femoral components were observed (table II). Pain and function were recorded on a 0 to 6 scale, based on Modified Merle d'Aubigné and Postel score (*16*), before and after surgery and at each follow-up (table III). Satisfaction levels were assessed on a scale of 0 to 5, at each postoperative follow-up (*5*) (table IV). Limp was not categorized as to type. Any limp, as observed by the evaluator or perceived by the patient, was categorized as a positive response. Finally, the results were compared with those in the published literature for the posterior approach and for other approaches as well.

RESULTS

Of the 121 patients, 118 were followed up for an average of 35.1 months (range 16 to 52 months). Three patients died of unrelated causes and were therefore excluded. Radiographs taken three months post-operatively showed the cup position was mostly anteverted (71/118) or neutral (43/118). The femoral stem was in neutral position in most (104/118) of the patients and a good proximal cement mantle was achieved in a majority (84/105) of patients as well (table I). Eighty-eight patients had no pain at three months and their number improved to 105 at one-year follow-up. At three months follow-up twenty-seven patients had discomfort at the start of activity that subsided soon after and their numbers reduced to ten at one-year follow-up. One of the three patients that had no rest pain, but complained of pain after activity at three months was asymptomatic at one-year follow-up.

Radiographs at one year follow-up showed no change in 114 acetabular components and 115 femoral components. One patient with radio-

Table I. — Radiographs at 3 months (n=118)

Acetabular Cup		Stem		Proximal Medial Cement	
Position	Number of patients	Position	Number of patients	Condition	Number of patients
Neutral	43	Neutral	104	Good	84
Open > 15°	2	Valgus	5	Thin	21
Closed > 15°	1	Varus	9	Absent	3
Anteverted	71	Malrotated	1	Not applicable	10
Retroverted	1	Other, state			
Others, state					

Table II. — Radiograph at 12 months (n = 118)

Acetabulum		Femur	
Position	Number of patients	Position	Number of patients
Unchanged	114	Unchanged	115
Progressive radiolucency	4	Progressive radiolucency	1
Bone erosion	0	Bone erosion	0
Upward migration	0	Tilting	
Medial migration	0	Sinkage	2
Frank loosening	0	Calcar resorption	0
Implant fracture	0	Periosteal reaction	0
Others, state	0	Implant failure	0
		Trochanteric non-union	0
		Others, state	0

lucency of both femur and acetabular components was considered for revision. Three other acetabular components were kept under close observation (table II).

At one year follow-up, 67 patients were back to activities of their normal daily living and 41 used a stick but had no limp. Twenty-three patients were limited without a walking stick but were normal with it. Nineteen had no stick but limped and two among these had limp due to ankle arthritis and rheumatoid arthritis respectively. Five patients were limited with one stick for less than one hour and four had limitation of activities of daily living with or without the use of a walking stick ; they belonged either to Charnley Groups B or C. Ninety-six patients thought that the operation was very good at three months and the number increased to 99 at one year follow up (table III).

Postoperatively, five patients (4.1%) had superficial infection that settled with oral antibiotics. Four patients (3.3%) developed heel sores. Two patients (1.7%) each had haematemesis, pulmonary embolism, urinary retention and haematoma at the wound site post operatively. Four patients developed deep vein thrombosis, despite mechanical prophylaxis with intermittent pneumatic compression, graduated elastic stockings and active and passive mobilisation of the major joints of the operated extremity. They returned to good function after treatment. One patient (0.7%) developed transient sciatic nerve palsy that recovered in 3 months. The medial wall of two acetabula was breached while reaming ; it was augmented with a wire mesh. There were no fractures of the greater trochanter. Though we realise that our results are short term (average follow-up of 35.1 months,

Table III. — Modified Merle d'Aubigné and Postel score (5)

Score	Pain	At 3 months	At 1 year
1	Severe and continuous	0	1
2	Prevents walking	0	0
3	Limited activity, rest/night pain	0	0
4	Pain after activity, not rest	3	2
5	Pain on starting to walk, improves	27	10
6	No pain	88	105
Total		118	118

Score	Function	At 3 months	At 1 year
1	Bedridden/few yards	0	0
2	Limited with/without support	2	4
3	Limited with one stick < 1 hr	16	5
4	Limited without stick, ok with	41	23
5	No stick but limp	15	19
6	Normal	44	67
Total		118	118

range 16 to 52 months), none of the replaced hips dislocated until the last follow-up.

DISCUSSION

Surgical approach for total hip replacement has remained controversial (*14,15,19*). Posterior approach is known to give less blood loss, to shorten operation time and to allow optimal component positioning (*7,22*). It is considered an easy access, with less soft tissue dissection than other hip approaches, especially direct lateral, and is associated with fewer gait problems as well (*14*). However, a higher percentage of posterior dislocation (3.2% to 4.2%) of the implanted hip has been observed with the posterior approach (*15,19*). Nevertheless, reattachment of the posterior capsular flap and tendons (of piriformis and obturator internus) to the greater trochanter have reduced the incidence of dislocation (*5,21,23*) from 4.8% to 0.7% in two groups of patients without and with posterior capsular repair respectively (*24*). Further, most dislocations happen to be posterior and a majority occur within the first six months of implantation (*21*). Our results are favourable with no dislocation at an average follow up of 35.1 months (range 16 to 52 months).

Pain was the most common indication for surgery among our patients. We had favourable results with 88.9% patients achieving a pain free status at one year follow-up and another 8.5% had only mild pain on initiation of activity. Most (97.5%) of patients said that the operation was 'very good' or 'worthwhile' as per the Modified Merle d'Aubigné and Postel score, which compares well with previous reports (*5,6,18,20, 23*).

Painless limp was observed in 15% of patients and is comparable to that reported in literature for the posterior approach and other approaches for total hip replacement (*6,11,19,22*) ; however we did not quantify abductor weakness and leg length discrepancy. Deep vein thrombosis (3.3%) in our study was comparable with earlier reports, [2.3% (*12*) and 8.9% (*17*)] and so was pulmonary embolism (1.7%) versus 0.2% (*12*) and 1.9% (*17*) in earlier reports. Sciatic nerve palsy in one patient resolved completely in 3 months time and is better than an earlier report (*8*). Another series (13) reported 0.4% incidence of a sciatic nerve palsy in patients operated by posterolateral approach

Table IV. — Patient satisfaction at 3 months and 1 year follow-up

Score	Satisfaction	At 3 months	At 1 year
1	Worse than before operation	1	1
2	Same as before operation	1	1
3	Slight improvement	2	1
4	Operation worthwhile	18	16
5	Very good	96	99
Total		118	118

without the release of gluteus maximus. None of our patients sustained an iatrogenic fracture of the greater trochanter, unlike 0.9% (*24*) and 0.7% (3) reported in earlier series.

The decreased number of early complications with particular notice to dislocation may be attributed to dedicated fellowship training in hip surgery, careful pre and post-operative patient management, supervised physiotherapy and an excellent occupational therapy support. Our results show a high number (99/118) of patients that were satisfied with their treatment. The 121 patients in our study represent the first three years of practice of a newly appointed consultant and the good results represent the skill and management that one can achieve through a dedicated fellowship-training program. Further, anticipated curtailment of the time spent in patient care during higher surgical training in the United Kingdom may have an effect on the learning curves and therefore the importance of fellowship training in hip surgery may be of increasing importance.

CONCLUSION

We conclude that the posterior approach, already known to cause less blood loss and to allow optimum component positioning and alignment, is compatible with a low overall rate of early complications. Specifically, the dislocation rate is low and comparable with large series performed by approaches traditionally considered to carry a lower rate of dislocation. Our study also illustrates that appropriate fellowship training, a careful preoperative preparation and a meticulous restoration of anatomy during the operation may help curtail the duration of the learning curve.

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