

Dislocation after hemiarthroplasty of the hip: a comparison of the dislocation rate after posterior and lateral approaches to the hip

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Key words: Hemiarthroplasty; Dislocation; Surgical approach

We compared the 3-month dislocation rate for hip hemiarthroplasties inserted via the posterior and direct lateral routes. In all, 2906 primary hemiarthroplasties, performed between 1986 and 1992 in four hospitals on a training hospital rotation, were analysed. The posterior approach was used in 1656 (57%) and the lateral in 1250 (43%). The groups were otherwise comparable.

The overall dislocation rate for the posterior approach was 9.0% (149/1656), whereas that for the direct lateral approach was 3.3% (41/1250). The difference is statistically highly significant.

In addition, we analysed the dislocation rate for each approach in the three broad groups of surgical trainee. For senior registrars, there was no statistical difference in the dislocation rate. However, for registrars and senior house officers, there were statistically highly significant differences in the dislocation rate for posterior and direct lateral approaches (8.4% vs 3.3% and 14.2% vs 3.6%, respectively).

We conclude that, because of the high mortality associated with dislocation of a hemiarthroplasty, the posterior approach for this operation should now be abandoned, especially by surgical trainees early in their careers.

Hemiarthroplasty of the hip was first introduced in 1940 by Moore and Bohlman (1), with the later introduction of the Austin-Moore endoprosthesis. Thompson introduced a similar endoprosthesis in 1954 (2). Moore (3) initially recommended the use of a posterior surgical approach for the insertion of his prosthesis. Following this, other approaches to the hip, most notably the anterior and anterolateral approaches, were utilised. In recent years, the description by Hardinge (4) of a direct lateral approach to the hip joint has popularised a previous description of a similar approach given by McFarland and Osborne in 1954 (5).

As far as we are aware, the dislocation rates for hemiarthroplasties introduced by the posterior and the direct lateral routes have only been compared on one occasion in the literature (6). They did not show a statistically significant difference between the dislocation rates. In our teaching hospital rotation, both approaches are used extensively for the insertion of hemiarthroplasties for fractures of the proximal femur, and we have compared the dislocation rates of the two routes.

Patients and methods

The outcome of 3118 consecutive primary hemiarthroplasties performed for fracture of the proximal femur in four hospitals on a training hospital rotation between 1986 and 1992 was analysed. The selection of approach used for the procedure was determined by the preference of the unit and surgeon. The hospital records were examined to

determine the surgical approach and for dislocation within 3 months of insertion. The seniority of the operator was noted. There was no difference in surgical method other than approach. Except for the prohibition of sitting for 5 days after the posterior approach, there was no difference in postoperative regimen for the two groups.

Of the 3118 procedures performed, 2906 (93%) were considered suitable for analysis. If records could not be found or were incomplete, if an approach other than the posterior or lateral type was used, or if a consultant had performed the surgery, the procedure was excluded.

Three prostheses were used in the study, the Austin-Moore (uncemented), the Ring modular (cemented) and the Thompson (both cemented and uncemented).

The overall dislocation rate for the posterior and direct lateral approaches was determined, and a statistical comparison was made using the χ^2 test. In addition, the dislocation rate with each approach was analysed for seniority of surgeon, ie senior registrar, registrar and senior house officer. A statistical analysis using the χ^2 test was again performed.

Results

All patients in the study were over 65 years of age, and there was no significant difference in the age ranges for the posterior and direct lateral approaches.

Of the 2906 cases included, 1656 (57%) were performed via the posterior approach and 1250 (43%) via the direct lateral approach. The approach used by each grade of surgeon is shown in Table I.

Of the 2906 procedures, 1784 used an uncemented Austin-Moore, 371 a cemented Ring modular, 257 a cemented Thompson and 504 an uncemented Thompson prosthesis.

Table II demonstrates the dislocation rate for hemiarthroplasties inserted using each of the two surgical approaches. Overall, 9.0% of hemiarthroplasties inserted by the posterior approach dislocated, compared with 3.3% of those by the direct lateral route. This difference is statistically highly significant ($P < 0.001$).

For senior registrars performing the procedure, there is a difference between the dislocation rate for posterior insertions (5.0%) and lateral insertions (2.2%). This difference is not statistically significant (P value of 1.58).

For registrars performing the procedure, the dislocation rate for posterior insertions (8.4%) is higher than that for direct lateral insertions (3.3%). This difference is statistically highly significant ($P < 0.001$). Similarly, for senior house officers performing the hemiarthroplasty,

Table I. Approach used by grade of surgeon

	Posterior	Lateral	Total
Senior registrar	159	136	295
Registrar	1244	896	2140
Senior house officer	253	218	471
Total	1656	1250	2906

Table II. Incidence of dislocation at each level of surgical seniority (upper figure denotes number of dislocations, lower figure denotes number of procedures)

	Posterior	Lateral	Total
Senior registrar	8/159 (5.0%)	3/136 (2.2%)	11/295 (3.7%)
Registrar	105/1244 (8.4%)	30/896 (3.3%)	135/2140 (6.3%)
Senior house officer	36/253 (14.2%)	8/218 (3.6%)	44/471 (9.3%)
Total	149/1656 (9.0%)	41/1250 (3.3%)	190/2906 (6.5%)

there is a higher dislocation rate with the posterior approach (14.2%) compared with the direct lateral approach (3.6%), a difference of high statistical significance ($P < 0.001$).

Discussion

In our series, the insertion of a prosthesis inserted via the posterior approach included division of the short external rotators of the hip and a posterior capsulectomy of some degree. The operated hip is most stable in extension and external rotation.

There are many modifications of what is termed the direct lateral approach. All are based on the fact that the tendinous portions of gluteus medius and vastus lateralis are in direct functional continuity through the thick periosteum covering the greater trochanter (5). The majority of the direct lateral approaches performed in our series were as described by Hardinge (4), although in some the tendon of vastus lateralis was left undisturbed. All the direct lateral approaches involved the division and the later repair of the tendinous portion of gluteus medius. The operated hip is most stable in flexion and internal rotation.

We have shown that the dislocation rate after hemiarthroplasty is significantly greater if a prosthesis is inserted through a posterior approach rather than by the direct lateral route. Although suspected by many, this has, to our knowledge, not previously been shown.

Although there was no formal policy in the units in which the study was carried out, there was a tendency to perform a hemiarthroplasty via the direct lateral rather than the posterior route for those patients with pre-existing neurological conditions, eg previous stroke, epilepsy, Parkinsonism. It is well-established that such patients, no matter what the approach, have a higher incidence of dislocation (7). Despite this bias, the direct lateral route has been shown to be more favourable, and this supports our argument even further.

We would now advocate the use of the direct lateral approach rather than the posterior approach for hemiarthroplasty because:

- 1 We feel that the posterior approach does not give sufficient soft tissue cover to a hemiarthroplasty. The

re-attached short external rotators do not provide sufficient stability, and the suture line may fail postoperatively. The loss of the strong posterior capsule in the procedure is an important factor in destabilising the hip (8). In contrast to this, the direct lateral approach includes an anatomical repair with the resuturing of the strong tendon of gluteus medius and/or vastus lateralis, and this provides an additional degree of stability.

- 2 Prohibition of patients sitting postoperatively after a procedure by the posterior approach has not been shown conclusively to reduce the dislocation rate. Nevertheless, because the operated hip is unstable in flexion, many centres adopt such a policy for a period after operation. This is a problem in the elderly, where one must aim to sit the patient out of bed as soon as practicable to prevent the consequences of immobility. As the direct lateral approach is more stable in flexion, patients may sit after operation.
- 3 Our study has suggested that, in terms of preventing dislocation, there is a steeper learning curve for the posterior approach than for the direct lateral approach. We analysed the dislocation rates for the three broad grades of surgical trainee. In the senior registrar group, although there is a higher dislocation rate for posterior approaches (5% vs 2.2%), this was not statistically significant. However, for registrars and senior house officers, the posterior approach involved a much higher dislocation rate (8.4% vs 3.3% and 14.2% vs 3.6%, respectively). We regard the posterior approach dislocation rate in senior house officers to be unacceptable.

Dislocation after a hemiarthroplasty can be a disaster, with reported death rates of between 50% and 65% (6,7,9). In our opinion, because of the greatly increased risk of dislocation, the posterior approach for hemiarthroplasty should now be abandoned, especially for junior surgeons early in their training, and we support the use of the direct lateral approach for hemiarthroplasty. Although the anterior and anterolateral approaches have their advocates, and indeed have a similarly low incidence of dislocation, they have an increased risk of operative complication, eg difficulty of prosthesis insertion, femoral shaft penetration and fracture of the greater

trochanter (9). The direct lateral approach is not reported to have such problems.

We are not the first to condemn the posterior approach. Wilson, as quoted by Boyd and Salvatore (10), when considering the posterior approach, stated: "This is a dangerous operation—it is too easy to do!". Davidson and Bodey (11) stated "the unacceptable mortality associated with dislocation following hemiarthroplasty, and the possible improvement in this complication rate with the anterior approach, indicate the need for a critical reappraisal of the surgical approach in this operation". We feel that our evidence, in a large series, condemns the posterior approach in hemiarthroplasty and, as such, should now be abandoned.

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Received 31 January 1994