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Anterior thigh pain after cementless total hip arthroplasty

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Abstract We compared the incidence of anterior thigh pain retrospectively following primary uncemented total hip replacement in 70 patients (78 hips) with osteoarthritis. In one group (38 hips), an Endoplus porous-coated, canal-filling prosthesis was inserted through an anterolateral approach. In the other group (40 hips), a Furlong hydroxyapatite-coated prosthesis was inserted through a posterior approach. The latter prosthesis has a relatively longer femoral stem and does not achieve diaphyseal press-fit contact. Three patients in the Furlong group had anterior thigh pain, which eventually resolved in two patients. In the Endoplus group, two patients developed anterior thigh pain; in both cases, there was an underlying cause, which had to be treated. Idiopathic anterior thigh pain is more common in non-canal-filling prostheses. When anterior thigh pain is noticed in canal-filling prosthesis, a search for and treatment of the cause will cure the pain. The hydroxyapatite coating did not prevent thigh pain in the Furlong group.

Résumé Nous avons comparé rétrospectivement la fréquence des douleurs antérieures de la cuisse après prothèse totale non cimentée chez 70 malades (78 hanches) avec coxarthrose. Dans un groupe (38 hanches), la prothèse à revêtement poreux Endoplus a été implantée par un abord antérolatéral. Dans l'autre groupe (40 hanches), la prothèse enduite d'hydroxyapatite Furlong a été implantée par un abord postérieur. Cette deuxième prothèse a une tige fémorale relativement plus longue et n'a pas un contact

press-fit diaphysaire. Trois malades dans le groupe Furlong avaient des douleurs antérieures de la cuisse, qui ont disparues pour deux d'entre eux. Dans le groupe Endoplus, deux malades ont développé ces douleurs, et, dans les deux cas, il y avait une cause sous-jacente qui a dû être traitée. La douleur antérieure, idiopathique, de la cuisse est plus fréquente avec la prothèse non remplissante. Quand cette douleur est notée avec une prothèse remplissante, la recherche et le traitement de la cause la feront disparaître. Le revêtement d'hydroxyapatite n'a pas empêché les douleurs de la cuisse dans le groupe Furlong.

Introduction

There is frustration when studying thigh pain following hip arthroplasty because there is so much opinion and so little science on the topic. The kind of alloy, the anatomical shape of the stem, and a low modulus of elasticity are important factors in avoiding stress-shielding and thigh pain [9]. The two main controversial issues are the shape of the prosthesis, in particular, the distal stem press-fit qualities, and the nature of the surface finish of the femoral stem. While some believe that the avoidance of press fitting at the distal part of the stem is important in avoiding stress shielding and thigh pain [1, 2], others observed that when the distal part of the femoral stem was unstable, the incidence of thigh pain rose from 13% in the first year to 22% in the second year [4, 8]. In this study, we compared two groups of patients who underwent uncemented total hip replacement. In one, the distal stem was not a press fit, and in the second, it was a canal-filling prosthesis.

Materials and methods

We carried out a retrospective review in the department of Trauma and Orthopaedic Surgery at Airedale General Hospital, West Yorkshire. The period of study was between 1996 and 2003. Seventy patients were included in the study. They underwent cementless total hip arthroplasty for

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primary osteoarthritis of the hip using two different types of prosthesis. Eight patients had bilateral total hip arthroplasty. In one group of 37 patients, a Furlong hydroxyapatite-coated, uncemented prosthesis (the distal part of the stem is not press fit) was inserted in 40 hips (three patients had bilateral hip replacement). The posterior approach was used in this group. The age range was 39–77 (mean 64) years. Fifteen were women and 22 were men. In the other group, an Endoplus (canal-filling, porous-coated prosthesis) was inserted through an anterolateral approach in 33 patients (38 hips; five patients had bilateral replacement). The age range was 50–87 (mean 69) years. Seventeen patients were women and 16 men.

Results

At the latest follow-up, the outcome measure used was the functional hip score of D'Aubigne and Postel [8]. The patients were reviewed at 6, 12, and 24 weeks and then annually. In those with thigh pain, further radiographs of the hip were performed. Pain intensity was assessed by a visual analogue score between 1 (no pain) and 10 (severe pain). Particular attention was taken not to confuse back, trochanteric, or buttock pain with thigh pain. Thigh pain was defined as pain in the front and mid part of the femur. None of the patients with thigh pain in either group required any further surgical intervention, and the pain was controlled by nonsteroidal anti-inflammatory medication alone (Table 1).

Furlong group The mean period of follow-up was 2.6 (range 1–7) years. The mean preoperative D'Aubigne and Postel functional hip score was four (range 3–7) in this group of patients. For 34 hips, the improvement was great (mean of 10, range 8–11), and in six hips, the improvement was very great (mean D'Aubigne and Postel score 12; range 11–14). There was pain in the thigh in three patients (in one, there was associated groin pain). Upon review, patients with thigh pain scored a mean value of 5 (range 5–6). The

thigh pain was throbbing in one but dull in the others. The pain was activity related in three. In one, it also occurred at rest. In one, the anterior thigh pain started 12 months after the operation and although this improved over a period of three months, it did not resolve completely. Radiographs (AP and lateral of the hip) did not show any abnormality to explain the thigh pain. In the remaining two patients, the thigh pain started six weeks after the operation. Nonsteroidal inflammatory medication was useful in only two patients with thigh pain. Mean postoperative duration of thigh pain was 4.3 (range 3–12) months. At review, one patient continued to have thigh pain. There were two complications in this group. In one, the artificial joint dislocated twice but eventually settled, and in the other, there was deep-vein thrombosis, which was treated. Neither of these patients had thigh pain.

Endoplus group

The mean period of follow-up was 3.1 (range 3–7) years. The mean D'Aubigne and Postel score improved from 4 (range 3–4) to a mean of 10 (range 9–11) in 33 patients. The improvement was fair (score of 7) in three patients; these patients had buttock pain requiring analgesics for an average of 2.5 months (range 1.5–4 months). Two patients had anterior thigh pain (D'Aubigne and Postel score of 5). In one, this pain was related to activity; he had shortening of an inch on the symptomatic side, and a shoe raise cured the pain. In the other, the thigh pain was related to deep wound infection (initial score of 4), which was treated with antibiotics, and the thigh pain resolved. At the latest follow-up, the D'Aubigne and Postel score was 8.

Discussion

Thigh pain is a concern in hip arthroplasty, it is thought be related to the implant used. In some instances, however, the pain arises from the spine. In other instances, the pain comes from the greater trochanter. Some patients have trochanteric bursitis, causing pain to radiate down the lateral aspect of the thigh. Pain from the femoral component is usually more anterolateral or anterior in the mid aspect of the femur. It is vital that the other causes of thigh pain are excluded before attributing the pain to the femoral stem [2]. It is believed that thigh pain following uncemented hip arthroplasty is generally transient and will go away over time. Activity-related thigh pain may occur in the first 6–8 weeks after surgery when patients have stopped using walking aids [2]. When pain persists, it is safe to assume that the prosthesis is loose until proven otherwise. Further investigations should be done to identify the source of pain. Radiographs of the hip to check for bone in-growth can be difficult to interpret. It is said that when there is no in-growth, subsidence and a pedestal can be seen; there may be some hypertrophy underneath the collar and a radiolucent line, which is best seen in the lateral view [8]. It is likely that the choice of a small size is the cause of loosening of the

Table 1 Comparative results of prostheses used

	Furlong group (40 hips)	Endoplus 38 hips
Design	Hydroxyapatite coated, longer prosthesis, tip of stem does not have diaphyseal press fit	Anatomical canal-filling, porous-coated
Approach	Posterior	Anterolateral
Buttock pain	3	0
Anterior thigh pain	3	2
Associated problems	None related	Infection; significant limb length inequality
Natural history	Settled; onset and time of improvement unpredictable	Settled when the associated problems were addressed
Pain relief	2 out of 3 responded to NSAIDs	Responded to antibiotics and shoe raise

femoral stem. In this case, the fixation of stem to bone is by fibrous tissue in-growth, and micro motion between the implant and bone often causes thigh pain [3, 4]. However, attempts to relate thigh pain to stem size have shown inconsistent results.

There are concerns that porous-coated femoral stems are associated with thigh pain, subsidence of the femoral prosthesis, and radiographic lucencies at the bone–prosthesis interface. It is believed that thigh pain is less common with hydroxyapatite-coated, press-fit total hip replacement [5]. This has not been our experience; most of our patients with thigh pain have been in the hydroxyapatite-coated Furlong group. This is perhaps due to the fact that the diaphyseal part of the uncemented femoral stem does not offer a press fit property, as there is a sharp transition between the metaphyseal and diaphyseal part. Indeed, further prospective, controlled trials have shown no difference in the presence or absence of hydroxyapatite when the geometry of the prosthesis has been identical [6, 7].

Our results have shown that distal stem fix, regardless of hydroxyapatite coat, was associated with fewer incidences of thigh pain. Our study group contains a relatively small number of patients; however, the difference of the outcome in the two groups was striking and some conclusions have been drawn.

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