Diagnostic value of intra-articular anaesthetic in primary osteoarthritis of the hip

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We investigated 42 patients who were being considered for primary total hip arthroplasty (THA), but in whom it was uncertain whether the hip was the source of their pain. They were given an injection of local anaesthetic into the joint space.

Of 33 patients who gained pain relief from their injection, 32 subsequently had successful THA. The remaining patient has not had surgery. The intra-articular injection of local anaesthetic is thus at least 96% sensitive. Of the nine patients who had no or only minimal pain relief from injection, one has had an unsuccessful THA, three have been successfully treated for other conditions and five have unresolved pain for which no organic basis has been established.

We believe that the injection of local anaesthetic into the hip is a reliable test, with low morbidity. In difficult cases it will aid in the clarification of the cause of pain which possibly arises from the hip.


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The diagnosis of hip disease is based on the history, clinical examination and radiography. It is usually straightforward, but an atypical history, coexisting pathology, unexpected clinical findings or the lack of radiological changes may make the source of the pain uncertain. Decisions on treatment may be difficult because surgeons are reluctant to advise major reconstructive hip surgery without a clear-cut indication. A simple, safe, inexpensive, reliable test is required which will establish whether the hip is the source of the patient’s symptoms. The injection of bupivicaine into painful total hip arthroplasties (THA)\(^1\) is known to provide useful information about the pain relief likely to be obtained from revision surgery.

Our aim was to establish whether the same test might prove equally valuable before a primary hip arthroplasty. In particular, we studied the benefit in patients with considerable pain but minimal radiological changes and in patients with concomitant spinal pathology.

Patients and Methods

Between 1991 and 1996, 42 patients were investigated, all of whom were under the care of one surgeon (GAG). These patients represented less than 1% of the patients investigated in our arthroplasty unit over the five-year period.

The assessment included a clinical history, physical examination and AP and lateral radiographs of the hip. If the diagnosis was in doubt, the patients were offered an injection of local anaesthetic into their hip.

The injection was performed by one of the authors or a research fellow working in the hip replacement unit. After infiltration of the skin with local anaesthetic a long 18-G spinal needle was inserted into the joint under fluoroscopic control. The needle was placed either one to two finger breadths anterior to the greater trochanter, or more anteriorly, avoiding the neurovascular bundle, having already palpated and marked the femoral artery. Once the joint had been entered, up to 10 ml of Marcaine 0.5% (Astra Pharmaceuticals Ltd, Kings Langley, UK) were injected before the needle was withdrawn. If the patient had pain from capsular distension the injection was stopped. We did not use injection of radio-opaque dye in this study, but this may be used to confirm the intra-articular position of the needle if there is doubt.

All the injections were done on an outpatient basis. On discharge, the patients walked from the day-surgery ward and were asked to keep a diary recording pain for the next 24 hours, while being encouraged to be as active as possible. An interview was arranged to discuss the findings and to decide on further management.

Those patients who subsequently had a hip replacement were reviewed after a minimum of six weeks to assess their
response to the operation. They were asked if their preoperative pain had been relieved and if they were satisfied with their operation. Radiographs were taken, but are not reported in this study as we were not assessing the behaviour of the implant.

Results

Of the 42 patients, 33 had complete pain relief after injection, one patient had minimal pain relief, and eight had no relief. Thirty-two of the 33 patients with pain relief eventually had a successful THA. Two of the nine patients with minimal or no relief from injection have subsequently had hip surgery; both had an unsatisfactory outcome. Two other patients with negative responses to injection were referred for the investigation of spinal pathology, and one of them had an L5 root decompression with relief of symptoms.

We present the results under four subgroups.

Group 1. This included 17 patients in whom the history was suggestive of osteoarthritis of the hip but who had minimal radiological changes. The injection relieved the pain in 16, and 15 of these went on to have a satisfactory THA. The diagnosis of osteoarthritis was confirmed at operation. The patient who did not have surgery is only 24 years of age and his pain is not severe enough to require an operation. The remaining patient had had a right THA with which she was unhappy, and had an injection into her left hip with only minimal relief of symptoms. A left THA was performed in spite of the findings from injection. This patient has remained dissatisfied with both her arthroplasties.

Group 2. This comprised 15 patients who had concomitant spinal and hip pathology. After careful clinical and radiological assessment doubt still remained as to the relative contributions of the hip and spine to their symptoms. Ten had complete pain relief after their injections and three had enough relief to feel that hip replacement was justified. All these patients have had THAs and are pleased with the outcome. Two of the three patients who did not have complete pain relief from their injections continue to have mild pain after THA. Before operation they were advised about the possibility of residual pain from spinal disease, and are therefore satisfied with the outcome. Two patients did not gain relief from injection. Both were referred to a spinal surgeon for investigation of their pain. One had decompression of an L5 nerve root with resolution of symptoms. The other subsequently developed a clinical picture more typical of a radiculopathy. She has had nearly complete resolution of her symptoms over the following three months and has not required surgery.

Group 3. Two patients had Paget’s disease and secondary osteoarthritis. Injection was used to help to assess the contribution of the arthritis to the pain. One patient gained complete relief from injection and proceeded to successful THA. The other had little relief from injection. A subsequent technetium scan showed an area of active Paget’s disease in the pelvis. Medical treatment for Paget’s disease is producing regression of symptoms.

Group 4. Eight patients had unusual pain patterns, and three gained relief from injection. Two had been thought to have trochanteric bursitis, but had had no relief from injection of their bursae. These two patients had relief from injection and subsequently had successful THAs. The third had had a left total knee replacement which was unsatisfactory. Local injections to her knee gave no relief, although all her pain was localised to the knee, and she had a good range of movement at the left hip. Radiographs showed mild osteoarthritic changes in the hip and the injection of anaesthetic into her hip gave complete relief of pain. At THA the hip showed severe articular cartilage damage, with a marked inflammatory response. She died ten days after the operation and therefore no follow-up is available.

Of the five patients who gained no relief from injection, one had an unsuccessful right THA elsewhere and still has pain around both hips. Injection of the unoperated hip produced no pain relief and a bone scan showed no increased activity. He also has spinal disease, but the source of his pain has not been identified. The other four patients have vague pains around their hips for which no organic basis could be found after extensive investigation. We are confident that their hips are not the source of the pain, and no operation is contemplated for any of these four patients.

Intra-articular injection had a low rate of complications and no infection. The injections were performed under sterile conditions in an operating theatre. One thin female patient suffered a temporary palsy of the femoral nerve. The injection gave good relief of hip pain, and therefore injection was probably into the joint and may have leaked of around her femoral nerve.

Discussion

The injection of local anaesthetic has been used as an aid to the diagnosis of shoulder pain, to help to clarify radicular pain in the upper limb and in the diagnosis of nerve-entrapment syndromes. It has also been used in the differentiation of hip from spinal pathology in 18 patients with radiologically proven osteoarthritis of the hip and spine and non-diagnostic leg pain. We have recently described its value in the study of painful THA.

We have now been able to confirm that intra-articular local anaesthetic is useful for distinguishing between pain from the hip and that from other sources, including the spine. More importantly, we have shown that the potential benefit of THA can be accurately predicted from the effect of intra-articular local anaesthetic. This can obviate the need for more expensive and less reliable investigations, especially when there is a possibility of spinal symptoms. When hip and spinal disease coexisted, but a neurological
examination was normal, we found that the hip was the source of pain in most cases. This agrees with the findings of Kleiner et al\(^5\) who reported 18 patients who had injection of local anaesthetic into the hip to differentiate hip from spinal pain; 17 were shown to have relief of hip symptoms. We agree that an injection into the hip, rather than a neurological block, is a more reliable and valuable investigation.

Two of our patients seemed to have both hip and spinal pain, but injection into the hip allowed them to distinguish their relative contributions. Despite incomplete relief from injection into the hip, both considered that THA was justified if it gave equivalent relief and now accept mild pain after THA, knowing that it is related to their spinal disease.

The causes of pain around the hip in Paget’s disease include the increased metabolic activity, neurological impingement, impending fracture, pseudofracture and secondary osteoarthritis.\(^6\) The injection of local anaesthetic can help to establish the contribution of the hip disease to the patient’s pain, as agreed by others.\(^7\) This is important when deciding whether hip replacement will be of benefit.

Manusco et al\(^8\) discussed the indications for total hip and knee arthroplasty after a survey of North American surgeons, finding great variation. They concluded that “many factors are important in how orthopaedic surgeons decide on whether to proceed with total hip arthroplasty and TKA, and the establishment of strict criteria regarding indications may not result in the selection of patients who will truly benefit most from these procedures”. A number of our patients had a successful THA, although they fell outside accepted surgical indications, particularly with reference to the severity of the radiological changes. Manusco et al\(^8\) reported that less than 10% of surgeons were prepared to operate on arthritic hips with mild joint-space narrowing; over 50% required radiological evidence of severe loss of joint space before considering surgery. There are times, however, particularly with medial pole arthritis, when radiological changes do not reflect the severity of symptoms or the degenerative changes found at surgery.

Since 32 of the 33 patients who gained pain relief from their injection have since had a successful THA, the investigation is at least 96% sensitive. The one patient who had a positive response to injection and has not had a THA probably does have early osteoarthritis, giving 100% sensitivity. We cannot comment reliably on specificity, since true-negative results have been confirmed in only four of nine patients. The remaining five patients still have unresolved pain; only relief of pain or the subsequent diagnosis of an extraneous source for their symptoms will allow confident assessment of the specificity of the test.

We believe that the injection of local anaesthetic into the hip is an inexpensive and reliable method of diagnosis and that it helps to decide methods of treatment.

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References