Total hip replacement after intra-articular injection of local anaesthetic and steroid

A. R. Chitre, M. J. Fehily, D. J. Bamford
From Stepping Hill Hospital, Stockport, England

Intra-articular injections of steroid into the hip are used for a variety of reasons in current orthopaedic practice. Recently their safety prior to ipsilateral total hip replacement has been called into question owing to concerns about deep joint infection.

We undertook a retrospective analysis of all patients who had undergone local anaesthetic and steroid injections followed by ipsilateral total hip replacement over a five-year period. Members of the surgical team, using a lateral approach to the hip, performed all the injections in the operating theatre using a strict aseptic technique. The mean time between injection and total hip replacement was 18 months (4 to 50). The mean follow-up after hip replacement was 25.8 months (9 to 78), during which time no case of deep joint sepsis was found.

In our series, ipsilateral local anaesthetic and steroid injections have not conferred an increased risk of infection in total hip replacement. We believe that the practice of intra-articular local anaesthetic and steroid injections to the hip followed by total hip replacement is safer than previously reported.

Intra-articular injections of steroid into the hip are used in the treatment of osteoarthritis, and also as a diagnostic tool to separate hip pain from referred pain such as that originating in the spine.1 This practice has been applied for over 50 years,2 despite some concerns over its efficacy.3,4

The literature on the efficacy of steroid injections shows variable results. There are studies that have shown both pain relief and improvement in range of movement of the affected joint for a period of up to 12 weeks.5,6 Others appear to show much more limited periods of pain relief,7,8 with some patients even experiencing an exacerbation of symptoms following injection.9

Our practice has been to use intra-articular injections in those cases where the source of the patient’s discomfort is in doubt, and in particular to differentiate it from either referred lumbar or trochanteric pain. We use a combination of long-acting local anaesthetic and steroid, as we feel that this has a more sustained effect than local anaesthetic alone.

Of concern is the possibility of an increase in deep joint infection in total hip replacement (THR) following the intra-articular injection of steroid. A recent study by Kaspar and de V de Beer,10 reported a significant increase in revision for infection in those patients who had undergone intra-articular steroid injection with a mean of 11.12 months between injection and THR, with an incidence of 10% in those who had received an injection compared with 0% in those who had not. Although there have been other case reports of septic arthritis following intra-articular steroid injection,11,12 to our knowledge this was the only study to look at outcomes following such injections to the hip followed by THR. We undertook an audit to see if we could establish whether there was an increased risk of infection when THR followed intra-articular injection of steroid.

Patients and Methods
We performed a retrospective study of all patients who had received an intra-articular steroid injection into the hip followed by an ipsilateral THR with a minimum follow-up of nine months. Patients were identified from theatre and hospital coding records. Between January 1996 and December 2000 a total of 1221 patients underwent hip replacement. In the same period we identified 99 patients (99 hips) who received intra-articular injections to the hip. Of these, 36 (36 hips) fulfilled our inclusion criteria of a THR following intra-articular steroid injection and had a minimum follow-up of six months. In all instances, the primary aim of injection was to...
distinguish between pain of spinal origin and pain intrinsic to the hip. In the six cases of bilateral injection followed by THR the second injection was at the request of the patient for pain relief while awaiting the second arthroplasty.

The mean age of the patients was 63.7 years (30 to 83) and the mean interval between injection and arthroplasty was 18 months (4 to 50). The mean length of follow-up was 25.8 months (9 to 78). One patient was lost to follow-up and was excluded.

All patients were under the care of the senior author (DJB), but surgeons of differing grades performed the injections and operations. All intra-articular injections were carried out by members of the surgical team in the operating theatre under strict sterile conditions. Skin preparation was undertaken using antiseptic betadine solution. Local anaesthetic (lignocaine 1%) was infiltrated into the skin in 32 patients. In the remaining four patients there is no record of local anaesthetic being used. In one the intra-articular injection of the hip was conducted during a general anaesthetic for a separate operation on the wrist. A skin puncture technique was used; using a lateral approach to avoid the groin, a 22-gauge spindle needle was used to infiltrate the hip, and intra-articular placement of the needle was confirmed by using radio-opaque contrast material under image intensifier control. Generally the intra-articular injection was a combination of 80 mg depomedrone and between 1 ml and 5 ml 0.5% bupivacaine.

All patients were given intravenous antibiotics (cefuroxime, 1 g) at induction of anaesthesia at the time of the hip replacement, with two further doses post-operatively, and gentamicin-impregnated cement was also used in all cases.

All data were gathered and analysed by the first author (ARC). This included a review of all patient notes, blood chemistry, microbiology and radiology. We defined superficial infection as that involving only the skin incision and subcutaneous layer, and not extending beyond the deep fascial layer. Deep infection was defined as being within the prosthesis cavity and was confirmed by positive microbiology.

**Results**

All radiographs of the 36 hips included in the study taken during a general anaesthetic (ARC). This included a review of all patient notes, blood chemistry, microbiology and radiology. We defined superficial infection as that involving only the skin incision and subcutaneous layer, and not extending beyond the deep fascial layer. Deep infection was defined as being within the prosthesis cavity and was confirmed by positive microbiology.

The second patient had repeated blood tests and radiographs over a two-year period without evidence of a deep infection. An independent second opinion with further blood tests, radiographs and an aspiration of the hip failed to identify evidence of infection. The patient was followed up for 46 months prior to discharge.

The mean length of hospital stay following THR was 9.2 days (5 to 25). There were eight early post-operative complications. There were three patients with urinary retention treated with catheterisation under gentamicin cover, and four cases of post-operative deep-vein thrombosis, diagnosed by ultrasound scan, one of which developed pulmonary embolism. A superficial wound infection occurred in one patient which was successfully treated, initially with a short period of intravenous antibiotics (flucloxacillin and benzyl penicillin) followed by oral antibiotics (flucloxacillin 500 mg four times daily). After 24 months this patient had not developed any further problems. There were no episodes of either superficial or deep infection that required surgical intervention.

**Discussion**

The number of patients who have a THR following an intra-articular injection of steroid into the ipsilateral hip is small. In our series only 3% (37 of 1221) of the total number of patients undergoing hip replacement had a previous intra-articular steroid injection; this matches previous studies.10 This infrequency makes large-scale data collection and analysis difficult. A power study using the conventional 80% power, based on a general infection rate of 1% and using Kaspar et al’s1 infection rate of 10%, would require 122 patients per group to obtain a result that was significant at p < 0.05. According to our current levels of activity, it would take approximately 17 years to obtain sufficient numbers of steroid injections.

Our mean follow-up after THR was 25.8 months. A recent paper14 has shown that although in a large series the majority of infections (81%) were diagnosed in the first two years, further infections may become evident over time.

Intra-articular steroid injections are more commonly performed in either the operating theatre or interventional radiology suites, where there is likely to be a stronger emphasis on asepsis. Kaspar and de V de Beer10 showed a 10% rate of infection in THRs performed after a previous steroid injection. Our experience contradicts this. We feel that there may be two identifiable contributory factors. The mean time between injection and surgery for our patients was 18 months (IQR 11.38 months quoted by Kaspar and de V de Beer10), and perhaps more significantly, all of our injections were undertaken in the operating theatre with full aseptic
precautions rather than a potentially contaminated radiology suite.

Although there is limited evidence for the effectiveness of intra-articular injections of steroid for symptomatic relief of hip pain, it is a useful method of distinguishing between pain originating from the hip and pain emanating from a different region, such as the spine. As yet, it is unclear whether it is the actual process of injection or the local immunosuppressive effects of steroid that is related to the subsequent development of infection. To our knowledge there are no studies comparing local anaesthetic with steroid injections in isolation.

Our findings suggest that the practice of intra-articular steroid injection through a lateral approach to the hip is safe, provided a strict aseptic technique is adopted. Given the conflicting evidence linking infection following THR with a previous steroid injection, we believe that a prospective randomised controlled trial is warranted to establish the safety of this practice. Given the small numbers involved, a multicentre trial would be required.

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.

References