Infection in primary hip arthroplasty after previous steroid infiltration

Ramankutty Sreekumar · Raj Venkiteswaran ·
Videsh Raut

Received: 22 February 2006 / Revised: 28 February 2006 / Accepted: 1 March 2006 / Published online: 21 June 2006
© Springer-Verlag 2006

Abstract Steroid Infiltration into arthritic joints is a common means of treating pain. It is also sometimes done to differentiate pain in the hip from that in the low back or knee. We performed a retrospective review of the notes of all patients who had undergone hip replacements in Wrightington Hospital under the care of the senior author (V.R.) from 1997 to 2004. We identified all patients who had at least 1 year follow up after the procedure. The infection rates in the patients who had received an injection of steroid into the joint prior to hip replacement and in a matched cohort who had received no such intervention were compared. In the injected group there was no incidence of infection during the period of follow up. There was one case of infection in a patient who had not had an injection prior to the arthroplasty. There was also a case of superficial infection in a patient who had no steroid infiltration prior to surgery, which responded to antibiotics. Steroid injections are a valuable adjunct in the management of patients with arthritic joints. This review clearly identifies no increased risk of infection in patients who had received the injection prior to the operation.

Résumé L'infiltration de corticoïdes dans les articulations arthrosiques est un traitement habituel de la douleur. Elles sont parfois également utilisées afin de différencier les douleurs de la hanche, des lombalgies ou des douleurs du genou. Nous avons réalisé une étude rétrospective de tous les patients ayant bénéficié d'un remplacement de prothèse totale de hanche à l'hôpital de Wrightington, opérés par

l'auteur sénior (V.R.) entre 1997 et 2004. Les taux d'infection ont été comparés chez les patients ayant eu une injection de stéroïdes avant l'intervention chirurgicale comparés à une cohorte de patients qui n'ont pas été infiltrés. Dans le groupe ayant bénéficié d'une infiltration de corticoïdes, il n'y a pas eu d'incidence, de problèmes infectieux durant la période de suivi. Nous avons constaté une seule infection chez un patient qui n'avait pas bénéficié d'une injection avant l'arthroplastie. De même, nous avons retrouvé une infection superficielle chez un patient qui n'avait également pas été infiltré avant l'intervention. Cette étude montre de façon claire qu'il n'y pas de risque d'augmentation de l'infection chez les patients qui ont eu une injection de corticoïdes avant une intervention chirurgicale d'arthroplastie totale de hanche.

Introduction

Steroid infiltration is a common method of pain relief in arthritic joints and is carried out by rheumatologists, general practitioners and orthopaedic surgeons. The hip, knee, shoulder, ankle, and carpometacarpal joints are the common joints where injections are performed [6, 8, 11, 13].

Steroid infiltration provides pain relief in patients who have to delay the operation for medical or social reasons [4]. This is particularly useful in young patients who may need to have their hip replacements delayed. It is also useful for differentiating pain from the low back or knee joint, which can confuse the clinical picture. There are conflicting reports of the duration of relief achieved with injections [2, 9, 10, 12].

Even though intra-articular steroid injections are useful in the treatment of patients with pain from ar-

R. Sreekumar (✉) · R. Venkiteswaran · V. Raut
Department of Orthopaedics, Wrightington Hospital,
Hall Lane, Appley Bridge,
Wigan WN6 9EP, UK
e-mail: r_sreekumar@hotmail.com

thritic joints, there is a recent report [7] that suggests that the risk of infection in these replaced joints is higher than in patients who had no intra-articular injections prior to the replacement.

Methods

We performed a retrospective review of patients who had received a hip replacement under the care of the senior author (V.R.) from 1997 to 2004. We looked at those patients who went on to undergo a hip replacement after steroid infiltration. The case records of these patients were inspected and compared with those of a matched cohort of patients who had undergone hip replacement without steroid infiltration prior to the surgery.

There were 145 injections in 131 patients in this period. Only 72 of these patients subsequently underwent hip replacement.

We excluded patients who had previous operations on the same hip and patients who had malignancy or were on immuno-suppressive drugs. No patient with a previous incidence of infection in the same hip was included.

The injections were given to delay the operation in 47 patients and to differentiate hip pain from back or knee pain in the rest.

A matched cohort of patients was obtained from the patients who had received no injection as the control group. The matching was done on the basis of age, gender and year of operation. Age selection was in 10-yearly intervals and year of operation at 3-yearly intervals. We established this group by applying the same exclusion criteria as those adopted for the study group. Each individual hip in the injected group was matched with two hips from the non-injected group. When exact matches were not available, the next closest match was taken.

All data were analysed and assessed by the same person. This included review of the case notes, including haematology and microbiology reports, imaging studies, operation notes and follow-up data.

Injection

Intra-articular steroid infiltration was done in the radiology suite. The affected hip was exposed and prepared with chlorhexidine solution. The procedure was done under image intensifier control. A BD spinal needle 20G was used, and the hip was approached in an anterolateral direction. Omnipaque (Amersham Health) 300 mgI/ml was injected when it was felt the needle had penetrated the capsule and the same was confirmed with the image intensifier. Then the hip was infiltrated with Depomedrone

2 ml (Depomedrone 40 mg/ml, Pharmacia) and Chirocaine (5 mg/ml). The patient was discharged the same day.

Total hip replacement

All the patients for hip replacements were selected very critically. Any patient considered overweight (BMI >35) was advised to lose weight prior to operation, and the surgical treatment was deferred till the patient had achieved the target weight. Some of these patients underwent injection for pain during this period. The patients were critically assessed for any focus of sepsis, including from the bladder, skin and lungs.

The hip replacement was by the trans-trochanteric approach. Trochanteric osteotomy was done, and the hip was exposed. Suction was kept to a minimum and used only during pulsed lavage to reduce the suction catheter sucking air towards the patient [3]. Regular washing of the wound was done with chlorhexidine 0.05%. Meticulous haemostasis was achieved before closure over drains. The patient was prescribed three doses of cefuroxime, postoperatively, in addition to the loading dose, to ensure cover for 24 h after the operation.

Statistical analysis

Statistical analysis of the results was performed using Stata (release 9). To assess non-inferiority of injection on risk of infection, a 95% confidence interval (CI) for the difference between the percentage of patients suffering infections in the two groups was obtained by the normal approximation method.

Results

Seventy-two patients underwent a hip replacement after having an intra-articular steroid injection. The average duration between injection and operation was 14 months, with a median of 11 months. There were three patients who had a previous hip fracture and had undergone hemiarthroplasty that had subsequently failed. There was one patient who had bladder carcinoma and had received radiation therapy 5 years earlier and another who had chemotherapy and radiotherapy for bowel carcinoma. There was a 36-year-old patient who had undergone multiple procedures for developmental dysplasia of the hip (DDH). Those patients were excluded, and the remaining 66 patients were included in the assessment. There were 51 female and 15 male patients. One man and one woman had bilateral procedures, leaving 68 hips for assessment; 41

were right hips and 27 were left hips. Sixty patients had completed at least a year's follow up after the procedure. The average age of the patients was 62.2 years. The age range was 32 years to 89 years, with a median of 62.62 years. The average follow up was 25.33 months. There was no incidence of infection in any of the patients up to the most recent follow up, resulting in an estimated infection rate of 0%. There were three patients who complained of aching over the hip that had been operated on, and those patients had tests for erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) and underwent an isotope scan, which confirmed no infection. There was one patient who required re-attachment of the trochanter after 2 years due to persisting pain.

We compared this group with a matched cohort of 136 hips in 136 patients who had undergone total hip replacement without a hip injection prior to the operation. There were 32 men and 104 women. The age range was 39 years to 89 years, with a median age of 64.09 years. The average follow up of this group was 22.28 months. There was one case of infection in a patient who was 75 years at surgery who presented 2 months postoperatively with pyrexia and severe pain in the operated hip. Infection was suspected, and, after aspiration of the hip, he was started on antibiotics. The cultures were positive for *Staphylococcus aureus*, and sensitive to flucloxacillin and fusidic acid. He developed acute renal shutdown and died of multi-organ system failure at 3 months from operation. There was another case of superficial infection noticed at 4 weeks, which responded to antibiotics, and, at latest follow up 16 months after surgery, the patient was infection free. The infection rate in uninjected patients was, therefore, 1.4% (2/136).

The difference in the incidence of infection was 1.4%. (95% CI -0.5% to 3.3%) This indicates that we can be highly confident that, if the incidence of infection is really higher in injected patients, it is by no more than 0.5%.

Discussion

This study was a retrospective review of the records of patients who had undergone a hip replacement after steroid infiltration. The operations were all performed by a single specialist hip surgeon at a tertiary referral hospital. The procedure of hip replacement was standardised, and the approach was trans-trochanteric in all cases. The antibiotic prophylaxis and follow up were similar in all cases. The data were all collated and assessed by a single person. This included a review of the case records, laboratory data and imaging studies, when relevant. Records were available for all patients.

However, we do accept that there are limitations in this study, as would be expected in a retrospective study. The control patients were compared with a matched cohort of patients who were selected on the basis of age, gender and timing of operation. This could introduce an inherent bias in our selection of patients. This should, however, not detract from our result, which clearly shows that the incidence of infection is, statistically, similar or lower in patients who have had an injection prior to hip replacement, which was the background to our study.

Steroid injections are a valuable adjunct in the treatment of patients with arthritic hip joints. In young patients who have hip pain it is important to try and delay operation. There are reports that suggest that the risks of injection, including infection, are remarkably few [1]. Injection of the hip joint can give adequate pain relief and enable the patient to delay the operation. Though there are doubts about the efficacy of these injections in the long term, they do provide relief in the medium-to-short term and can be extremely beneficial in identifying the source of pain in patients with multi-joint pathologies [4, 5]. It is a relatively minor procedure and can be performed as a day case.

Kaspar and De Beer [7] have emphasised the risk of infection in a recent article, which questions the usefulness of the procedure. They reported a very high incidence of infection in injected patients in comparison with a matched cohort of uninjected patients. The choice of patients for injections in their study appears to have been made by radiologists, rheumatologists and multiple surgeons. It is also not clear whether the surgical procedure was done by one surgeon or multiple surgeons and whether the protocol was standardised. We have had no incidence of infection in a hip replacement after prior steroid infiltration into the same joint. Statistical analysis shows no increase in infection compared to those who did not have an injection. Our results are based on a series performed by a single specialist hip surgeon under a standardised protocol. We would agree with the argument that steroid infiltrations have very little role in the long-term treatment of an arthritic hip. However, the advantages of medium-term pain relief, coupled with the advantage of being able to differentiate the source of pain in patients with back or knee pain in addition to hip pain, cannot be ignored. Given our results of no increased incidence of infection, we feel this is a useful procedure in the treatment of osteoarthritis of hip joints and see no reason to discontinue its use.

References

1. Cooper C, Kirwan JR (1990) Risks of corticosteroid therapy. Clin Rheumatol 4:305–332

2. Creamer P (1999) Intra-articular corticosteroid treatment in osteoarthritis. *Curr Opin Rheumatol* 11:417–421
3. Davis N, Curry A, Gambhir AK, et al (1999) Intraoperative bacterial contamination in operations for hip replacement. *J Bone Joint Surg Br* 81:886–889
4. Flanagan J, Thomas TL, Casale FF, Desai KB (1988) Intra-articular injection for pain relief in patients awaiting hip replacement. *Ann R Coll Surg Engl* 70:156–157
5. Griffith SM, Dziedzic K, Cheung NT, Dean T, Jones PW, Dawes PT (1997) Clinical outcomes: a double blind randomised controlled trial to compare the effects of intra-articular local anaesthetic and local anaesthetic plus steroid in hip patients. *Br J Rheumatol* 37 [Suppl]:21
6. Hochberg MC, Altman RD, Brandt KD, Clark BM, Dieppe PA, Griffin MR (1995) Guidelines for the medical management of osteoarthritis: Part II. Osteoarthritis of the knee. *Arthritis Rheum* 38:1541–1546
7. Kaspar S, De V, de Beer J (2005) Infection in hip arthroplasty after previous injection of steroid. *J Bone Joint Surg Br* 87:454–457
8. Neustadt DH (1997) Local steroid injections: comment on the American College of Rheumatology guidelines for osteoarthritis of the knee and hip. *Arthritis Rheum* 40:1914–1915
9. Plant MJ, Borg AA, Dziedzic K, Dawes PT (1994) Intra-articular steroid injection of the hip improves pain and movement at two weeks but not at three months (abstract). *Br J Rheumatol* 33 [Suppl 1]:76
10. Plant MJ, Borg AA, Dziedzic K, Saklatvala J, Dawes PT (1997) Radiographic and response to corticosteroid hip injection. *Ann Rheum Dis* 56:476–480
11. Scott DL (1993) Guidelines for the diagnosis, investigation and management of osteoarthritis of the hip and knee. *J R Coll Phys Lond* 27:391–396
12. Smith RW, Cook PL, Cawley MID (1994) A survey of arthrography and intra-articular corticosteroid injection of the hip (abstract). *Br J Rheumatol* 33 [Suppl 1]:76
13. Swezey RL (1996) Comment on the American College of Rheumatology guidelines for osteoarthritis of the knee and hip. *Arthritis Rheum* 39:2083