Case report

Male infertility and avascular necrosis of the femoral head

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Corticosteroids are an important part of the pharmacological armamentarium against a wide spectrum of diseases. They are powerful drugs that effect all aspects of human metabolism and, although often life-saving, they have a plethora of important side-effects and a narrow therapeutic window. Most side-effects are well known to physicians but we would like to highlight the problem of avascular necrosis associated with cyclical steroid therapy of short duration using moderate doses for an unusual indication.

Key words: Male infertility – Avascular necrosis – **Corticosteroids**

Avascular necrosis poses a formidable management problem in young, active and otherwise healthy men. Frequently, arthroplasty is required at a young age and this has a major impact on patients' life-style. Several studies have shown that hip arthroplasty for avascular necrosis has a higher failure rate than when performed for age-matched controls with different indications.¹

The use of steroids in male infertility associated with antisperm antibodies is relatively new and some success has been reported,² although others have not shown significantly improved pregnancy rates.³ We present two cases where their use for this indication resulted in bilateral avascular necrosis of the femoral heads in young men. In neither case was the patient warned about this complication prior to commencing treatment.

Case report 1

A 37-year-old married Asian gentleman presented with a 4-month history of left-sided hip pain. The pain was felt

in the groin and outer thigh and radiated to the knee. It was aching in nature, continuous, woke him at night and was exacerbated by walking. His exercise tolerance was 400 yards, limited by hip pain and he required a walking stick. His past medical history was unremarkable and his only drug ingestion was analgesics (proprietary combinations of paracetamol and codeine) since the onset of the pain. He was a non-smoker and his alcohol ingestion was low (7 units/week). He had undergone ligation of a varicocoele. Two years prior to presentation, he was treated for infertility with four courses of prednisolone, 40 mg/day for 10 days, timed to correspond with the fertile period of his wife's menstrual cycle. He had no other known risk factors for avascular necrosis and remains childless.

Radiographs showed avascular necrosis of the left hip (Fig. 1) and magnetic resonance imaging confirmed grade 1 (asymptomatic and without plain X-ray changes) avascular necrosis of the right hip. Therefore, he underwent bilateral core decompression of the femoral

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Figure 1 Radiographs showing avascular necrosis of the left hip.

heads with initial relief of symptoms. Three years later, his left hip pain had deteriorated such that it was severe, continuous, prevented him from sleeping and his exercise tolerance was limited to 50 yards with a walking stick. He was unable to achieve pedicure and could no longer don his own socks without aids. He had also developed significant pain on the right side. Examination revealed an antalgic gait, a 25° fixed flexion deformity at the left hip with further flexion only at 60°. The hip was otherwise 'trackbound' with no discernible abduction, adduction or rotation. He underwent a cemented left total hip replacement without complication and is now pain-free on the left. It is likely that he will need a similar procedure on the right.

Case report 2

A 34-year-old, married, Asian, male ophthalmic optician presented with a 12-month history of bilateral knee pain and no history of trauma. The pain was felt anteriorly in the knees and was associated with occasional hip pains. It was worse in the mornings and his exercise tolerance was half a mile. Nine months previously he had been treated by an osteopath using ultrasound with transient benefit. Past medical history included tonsillectomy in childhood but no other operations. Two years previously, he had been treated for infertility with a single course of pred-

nisolone 40 mg/day for 6 weeks. His wife immediately became pregnant and delivered a healthy child. He drinks no alcohol and smokes 10 cigarettes a day. There was no history of non-steroidal anti-inflammatory analgesic ingestion. Following the first pregnancy, the couple have had a second successful pregnancy, this time without steroid assistance.

On examination, he had limitation of all movements in both hips with bilateral fixed flexion deformities of 5° on the left and 10° on the right. Examination of the knees was normal. Radiographs confirmed bilateral avascular necrosis of the femoral heads.

In October 1995, he underwent bilateral core decompression of the femoral heads and the diagnosis of avascular necrosis was confirmed histologically. Since then, his pain has reduced and his range of movement increased by physiotherapy, but his activity remains restricted. He will be kept under review and it is likely that he will need further surgery in the future.

Discussion

Several risk factors have been identified in the aetiology of avascular necrosis including, corticosteroid use, alcohol, trauma, infection, sickle cell disease, connective tissue disease, vasculitis, myeloproliferative disease, Gaucher's disease, caisson's 'disease', coagulopathies, pancreatitis,

pregnancy and radiation. None were identified in either of our cases other than they had both taken prednisolone in the treatment of male infertility. Steroid ingestion has the commonest aetiological association with avascular necrosis in Western populations and incidences of up to 52% have been reported in patients taking long-term steroids for systemic lupus erythematosus and post-transplant, where high doses are used.⁴

Both our patients presented within 2 years of taking steroids and this appears to be typical. The commonest initial indications for steroid therapy leading to avascular necrosis are systemic lupus, following organ transplantation, rheumatoid arthritis and asthma. These are all life-threatening conditions, with high levels of morbidity, where prolonged high-dose therapy may be necessary. Intermittent high-dose treatment of male infertility with methyl-prednisolone 96 mg/day for 7 days has been associated with avascular necrosis of the femoral heads.⁵ The regimen that was used in the cases of both our patients has apparently evolved as it has similar efficacy to higher dose regimens but is theoretically safer.² In fact, no cases of avascular necrosis have previously been reported during controlled trials of this regimen in 140 patients.⁶

When steroids are used to improve quality of life in patients who are physically healthy, caution must be exercised by both physician and patient. This is particularly true in patients who are infertile where there are no direct physical benefits for the patient. With the introduction of new technologies in the management of

sub-infertility, including intracytoplasmic sperm injection and *in vitro* fertilisation, it may be that such toxic drugs as steroids will become obsolete for this indication. Until they do, it is essential that infertile couples who may go to any lengths to achieve pregnancy, are fully informed of the complications that may have an important bearing on their future. Although, it is clear that patients may forget much of what is told to them in medical consultations, it appears that neither of our patients were fore-warned of the possibility and both are likely to have a life-long association with orthopaedic surgery.

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