M. J. Farrar
A. Walker
P. Cowling

Possible salmonella osteomyelitis of spine following laser disc decompression

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M. J. Farrar · A. P. Walker (✉)
Department of Orthopaedics,
Scunthorpe General Hospital,
Cliff Gardens, Scunthorpe,
North Lincolnshire, DN15 7BH, UK
Tel.: +44-1724-282282;
Fax: +44-1724-290131

P. Cowling
Department of Pathology,
Scunthorpe General Hospital,
Scunthorpe, UK

Abstract We report a case of chronic discitis and vertebral osteomyelitis that we believe was caused by *Salmonella typhimurium* following laser decompression of the L4/5 disc for symptomatic disc protrusion in a 50-year-old Asian man. The infection was successfully treated with intravenous ceftriaxone combined with oral ciprofloxacin. We believe this to be the only report of such a complication following this procedure, which is generally without infective complications.

Key words Laser disc decompression, complications · *Salmonella* infections · Osteomyelitis, spinal

Case report

A 52-year-old Asian man was diagnosed clinically and with CT scan as having right sciatica due to an L4/5 disc protrusion causing pressure on the right L5 nerve root. Conservative management was unsuccessful and he underwent laser disc decompression with a KTP Laser delivering 1250 J energy (Laserscope, Gwent, UK).

The patient had a past history of pulmonary tuberculosis, but bronchoscopy performed 2 months before the surgery was negative. His leg pain did not improve, and 1 month after the disc decompression he was admitted for bed rest. His straight leg raise was restricted at 40°, but there was no other neurological deficit. An MRI scan was performed (Fig. 1), which showed end plate oedema and disc changes, which were interpreted as being consistent with the operative procedure. His symptoms improved and he was discharged.

The back and leg pain returned, and 6 months following the disc decompression further investigations were performed. The patient was afebrile; white cell count and differential, plasma viscosity, plasma protein electrophoresis, C-reactive protein and anti-staphylococcal antibodies were normal. Three sets of samples of early morning urine, sputum and blood cultures taken for tuberculosis were negative.

A second MRI scan was performed (Fig. 2), which showed signs of an acute or chronic discitis at L4/5 with destruction of the disc space and adjacent end plates anteriorly. There was minimal

abscess formation and an enhancing soft tissue mass extending posteriorly to the theca. Blood cultures grew *Salmonella typhimurium* (phage type 104). Aspiration of the L4/5 disc space was attempted under local anaesthesia, but was unsuccessful. Stool culture was negative.

Assuming the *Salmonella* to be the infecting organism, treatment was initiated with 2 g intravenous ceftriaxone once daily and 750 mg oral ciprofloxacin twice daily, to which the organism showed in vitro sensitivity. Symptoms improved with bed rest and plaster jacket, combination antibiotics were given for a total of 6 weeks and oral ciprofloxacin for a further 6 weeks. Three months after stopping antibiotics, the patient's back and leg pain had improved and MRI scan (Fig. 3) showed resolution of the soft tissue mass with progression towards osseous fusion between the L4 and L5 vertebral bodies.

Discussion

Percutaneous laser disc decompression is a relatively new technique, and its clinical effectiveness is yet to be established. In uncontrolled clinical studies it has been shown to be a safe procedure with no septic complications reported to date [3, 6]. We believe that this is the first report of septic complications following this procedure.

Fig.1 T1-weighted mid-sagittal MR images of the spine, with and without contrast, showing narrowing of the L4/5 disc space and end plate oedema, 1 month following laser disc decompression

Fig.2 T1-weighted mid-sagittal MR images of the spine, with and without contrast, showing disc space and end plate destruction with an enhancing soft tissue mass extending posteriorly up to the spinal theca, 6 months following laser disc decompression

Fig.3 T1-weighted mid-sagittal MR images of the spine, with and without contrast, 3 months after completing antibiotic treatment, showing resolution of soft tissue mass and progression to bony fusion of the bodies of L4 and L5

In our patient the low titres of anti-staphylococcal antibodies did not support a staphylococcal aetiology. We believe that the *Salmonella* was the aetiological organism, spreading haematogenously from asymptomatic gut carriage, seeding to and colonising the necrotic tissue left in the disc space following the decompression. Stool culture was negative, as these were taken after starting antibiotics.

Salmonella bone and joint infection is uncommon, the reported incidence being approximately 2% of all pyogenic spinal osteomyelitis [9]. *Salmonella* osteomyelitis is most commonly associated with Sickle Cell Disease [2], but the organism is recognised in non-sickle subjects [7]. Many of the strains of *salmonella*, including the typhoidal and non-typhoidal, cause bone infection and patients often have no clinical symptoms of generalised *salmonella*

infection [5, 7]. *Salmonella typhimurium* has been reported in 6–30% of sickle-cell related infections, and chronic bacteraemia has been noted to precede vertebral infection [2].

In chemonucleolysis [4] and discography [8], disc space infection is seen in less than 1% of cases and is of staphylococcal origin, caused by contamination of the spinal needle from inadequate skin preparation. *Salmonella* organisms are not typically associated with skin contamination.

In the immigrant population, tubercular disease has been seen to be the aetiology in 39% of spinal infections [9], but *Salmonella* should not be forgotten in this population, where subclinical carriage is common [1]. This case is unusual and we do not think that routine stool screening of patients before laser disc decompression is necessary.

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