The value of MRI in the diagnosis of postoperative spondylodiscitis

Abstract  We evaluated the role of MRI in the diagnosis of postoperative spondylodiscitis. Spondylodiscitis is a serious complication of surgery, and the diagnosis frequently depends on a combination of clinical, laboratory and imaging findings. We compared the MRI findings in six patients with biopsy- or surgery-proven spondylodiscitis with those in 38 asymptomatic postoperative patients. Contrast enhancement and signal changes in the intervertebral disc or the vertebral endplates are not specific for spondylodiscitis, being also seen in the asymptomatic patients. However, absence of Modic type 1 changes, of contrast enhancement of the disc or of enhancing paravertebral soft tissues suggests that the patient does not have spondylodiscitis. MRI appears more useful for exclusion than for confirmation of postoperative spondylodiscitis.

Key words  Spine, surgery · Infection · Magnetic resonance imaging

Introduction

Spondylodiscitis, discitis with vertebral osteomyelitis, is a rare but well-known complication of lumbar disc surgery, seen not only after surgery or chemonucleolysis [1, 2], but also after diagnostic procedures such as discography [3, 4] and even myelography [5]. Postoperative spondylodiscitis occurs in 0.1–3% of patients [6–9]; although the incidence may be decreasing due to better technical and prophylactic measures it can not be completely eliminated. The disc-space infection is probably due to intraoperative contamination rather than hematogenous spread [10, 11]. Pre- or perioperative infections and compromised patient immunology may be predisposing factors. The infection is most frequently caused by Staphylococcus epidermidis or Staphylococcus aureus [11–13].

Spondylodiscitis is a serious complication which may lead to longlasting and sometimes permanent morbidity [11, 14–17]. It is commonly accepted that early, adequate treatment is capable of shortening its course and reducing severe sequelae.

The diagnosis of postoperative spondylodiscitis depends on a combination of clinical, laboratory and
imaging findings. Clinically, severe low back pain, with or without sciatica, appears 7–28 days after surgery [16, 18], at an average of 16 days postoperatively [13]. There may be a typical posture in extended position with an inability to bend and with tapping or jolting pains [19]. Clinical findings and classical screening methods such as white blood cell count, erythrocyte sedimentation rate and elevated temperature are, however, not reliable and have a high failure rate in detecting spondylodiscitis [14, 15, 20, 21]. C-reactive protein (CRP) has proved a much more reliable screening test for infectious complications after lumbar disc surgery [22]. PMN-elastase assay has a 100% negative predictive value and can be used to exclude spondylodiscitis in the early stage [23].

Conventional imaging techniques such as plain films, tomography and CT are not reliable for detecting spondylodiscitis in the early stages [6, 7, 12, 16, 18]. Scintigraphy may be negative in the early stages and, even if positive, is nonspecific. Few studies have investigated the role of MRI in the diagnosis of postoperative spondylodiscitis; as the sole method unreliable, according to some workers [12, 24]. One study suggests that a combination of MRI findings is characteristic of postoperative discitis [27], but these findings are not confirmed in a more recent study [12].

Biopsy of the disc and isolation of the organism may yield the definite diagnosis [11, 14]. Since fine-needle aspiration is often negative in cases of septic spondylodiscitis [12, 26], biopsy with a nucleotome is recommended [27].

We examined the value of MRI in the diagnosis of postoperative spondylodiscitis.