Aortic pseudoaneurysm in the L3-L4 disc space after lumbar disc surgery

A CASE REPORT

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We report a patient who developed an aortic pseudoaneurysm in the L3-L4 disc space after lumbar disc surgery. The diagnosis was made by MRI and aortography, and repair using a prosthetic graft and anterior fusion was successful.

We discuss the predisposing factors, the clinical picture and management of vascular injuries during disc excision.

J Bone Joint Surg [Br] 1998;80-B:448-51.

Received 21 November 1997; Accepted 22 December 1997

Major vascular injury is an unusual but life-threatening complication of lumbar disc surgery and was first reported in 1945 by Linton and White.¹ Simple laceration of a major vessel may produce immediate haemorrhage or lead to an arteriovenous fistula or pseudoaneurysm, and mortalities as high as 50% have been reported.^{2,3}

We describe a patient with a pseudoaneurysm of the aorta extending into the L3-L4 disc space after lumbar disc surgery, and could find no report of a previous case. The pseudoaneurysm was successfully repaired with a prosthetic aortic graft and an anterior interbody fusion.

Case report

A 75-year-old man had an operation elsewhere for stenosis of the lumbar spinal canal of the combined type. Partial laminectomy was performed with removal of the L3-L4 intervertebral disc. The diagnosis had been confirmed by myelography and MRI (Fig. 1). There had been no abnormal bleeding from the disc space or any episodes of low blood pressure or tachycardia. The postoperative recovery had been uncomplicated and the patient had been discharged at four weeks after operation.

Two-and-a-half years later, he gradually developed numbness in both legs and a gait disturbance, which was investigated at our hospital. Plain radiography showed abnormal widening of the L3-L4 disc space (Fig. 2). A few weeks later, he was admitted as an emergency with acute arterial thrombosis affecting the right leg. Angiography showed thrombosis of the right common iliac artery and the contrast medium also entered the L3-L4 disc space (Fig. 3). MRI confirmed that this space was widened. The signal intensity was low on the T1-weighted image and high on the T2-weighted image, the same as the blood in the aorta, and ciné MRI showed a flow void (Fig. 4). CT confirmed that the pseudoaneurysm arose from the aorta, and blood tests showed incipient disseminated intravascular coagulation.

An emergency operation was performed under aortic clamping. The connection between the pseudoaneurysm and the aorta was located and resected. A repair was made using a 16 mm diameter prosthetic aortic graft (Bard Albumin Coated Graft; Bard Vascular System Division, Billerica, Massachusetts) and an anterior interbody fusion was performed. Severe instability was apparent, and the fusion was therefore buttressed with pedicle screws and rods.

The patient made a good recovery and after two months was discharged from hospital, walking without a cane, with satisfactory neurological status and spinal stability. Repeat aortography showed good graft patency with no leakage or recurrence of the pseudoaneurysm (Fig. 5).

Discussion

Vascular complications of lumbar disc surgery may be more common than appreciated: a 1984 review found over 200 reported cases.⁴ Most injuries involved the common iliac vessels after operations at L4-L5,^{3,5,6} but the actual incidence of haemorrhage, arteriovenous fistula and pseudoaneurysm is unknown.

Most reports are of arteriovenous fistulae,⁷⁻¹¹ because of their unusual features,¹² but the actual percentage may be quite low. A questionnaire study by De Saussure³ of 106 patients showed injury to a single artery in 65%, an arteriovenous fistula in 25% and an isolated venous injury in 20%. Only one pseudoaneurysm was seen. Jarstfer and Rich¹³ reported mortality rates of 34% after arterial injury, 71% after

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0301-620X/98/38569 \$2.00

Fig. 1a

Fig. 1b

The initial anteroposterior (a) and lateral (b) myelograms before disc surgery showing stenosis of the lumbar spinal canal maximal at L3-L4.

Fig. 2a

Fig. 2b

Anteroposterior (a) and lateral (b) radiographs 2.5 years after disc excision showing abnormal widening at L3-L4.

Fig. 3a

Fig. 3b

Preoperative anteroposterior (a) and lateral (b) aortograms showing that contrast medium filled the L3-L4 disc space.

Fig. 4a

Fig. 4b

Fig. 4c

MR images: a) T1-weighted, b) T2-weighted, diastolic phase and c) T2-weighted, systolic phase. A flow void is seen in (c), indicating a connection between the aorta and the pseudoaneurysm.

Fig. 5a

Fig. 5b

Fig. 5c

Postoperative anteroposterior (a,b) and lateral (c) aortograms, showed good graft patency with no leakage or recurrence of the pseudoaneurysm.

venous injury, and 10% after arteriovenous fistula.

Arterial injury usually produces massive bleeding with tachycardia and hypotension, but the symptom may not be recognised during the operation because the patient is usually in a prone position. The diagnosis may be delayed until the patient is placed in a supine position, with a consequent increase in mortality. An arteriovenous fistula is often missed initially because of the limited external bleeding and only about 10% are diagnosed within 24 hours, while some 20% are only recognised more than one year later.¹³

Pseudoaneurysm is the least common sequel of vascular injury and symptoms may become evident only after a number of years. Thromboembolism, as in our case, may be an important indicator of the diagnosis. Both true and false aneurysms have been described in association with arteriovenous fistulae,¹² but we believe that our patient is the first reported case of pseudoaneurysm in a disc space.

The detailed cause is not clear, but we speculate that the initial injury affected only the outer layers of the aorta, and that herniation and rupture of the intima into the disc space occurred only after granulation tissue had matured. Within the disc space, the blood was confined by the annulus fibrosus, the cartilaginous endplates and the longitudinal ligaments; the pseudoaneurysm did not enlarge further so that early symptoms were not severe.

De Saussure³ reported that bleeding from the disc space was noted in under half of the 106 vascular injuries that he reviewed. The acute signs of surgical shock and a palpable abdominal mass are rarely present, but when there is any possibility of vascular injury, immediate exploration is recommended.¹ The abnormal widening of a lumbar disc space on plain radiography must be extremely rare, but if it is found in patients after previous lumbar surgery, with or without arterial thrombosis, the diagnosis of pseudoaneurysm of the aorta into the disc space should be considered.

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.

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