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Acrylic vertebroplasty in symptomatic cervical vertebral haemangiomas: report of 2 cases

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Abstract We report two cases of acrylic vertebroplasty in symptomatic cervical vertebral haemangiomas. In both cases significant improvement of symptoms was rapid. One patient was able to return to work.

Key words Acrylic vertebroplasty · Vertebral haemangioma · Cervical spine · Computed tomography · Magnetic resonance imaging

Introduction

Vertebral haemangiomas (VH) are benign tumours rarely involving the cervical spine (7 % in the series of Laredo et al. [1]). VH have been classified into three categories: asymptomatic, compressive and symptomatic [1]. We report two cases of acrylic vertebroplasty in symptomatic cervical VH, with good long-term clinical improvement.

Case report

Case 1

A 33-year-old woman gave a 3-year history of severe neck and radicular pain, which considerably limited her social and professional activities. CT (Fig. 1 a) showed the typical regular and well-defined trabeculation of haemangioma involving the right part of the C4 vertebral body. The lesion did not extend into the epidural space, and soft tissues were normal. No disc herniation or foraminal stenosis was observed. MRI (Fig. 1 b) showed a high-signal lesion of the body of C4 on both T1- and T2-weighted images. Selective angiography was normal, without any pathological vascular blush. Taking into account the severity of the pain, and although there were no radiological criteria of aggressiveness, a vertebroplasty was advised. This was performed under fluoroscopic control. The patient was supine, and a 14 G needle was introduced in the vertebral body by an anterolateral approach. We injected 1.5 ml acrylic cement (methylmethacrylate) into the angiomatous lesion. Plain radiographs and CT were performed immediately after the injection (Fig. 1 c, d). The pain disappeared immediately after the treatment. Nine months later the patient was still asymptomatic and was leading a normal professional life.

Case 2

A 51-year-old woman gave a 2-year history of persistent cervical pain, with recurrent stiff-ness of the neck. Plain radiographs of the cervical spine were reported as normal. CT (Fig. 2 a) and MRI showed a typical nonaggressive VH of C4, involving the right side of the body. There was no epidural extension, and the soft tissues were normal. No degenerative change was observed in the spine. A vertebroplasty was performed and 1.5 ml acrylic cement (methylmethacrylate) injected into the angiomatous lesion. Slight leakage of cement into epidural veins, behind the body of C4, was observed on follow-up CT (Fig. 2 b). Relief of pain was immediate and the patient remained asymptomatic at 6-month follow-up.

Discussion

VH are common benign tumours found in about 12 % of general autopsy series [2], but cervical lesions are rare (7 % in the series of Laredo et al. [1]). They are usually asymptomatic. Nevertheless, neurological symptoms, including local pain, neurological deficits or neuralgia can be observed. Recently, a co-operative study of the Societé française de Neurochirurgie [3] reported 45 cases of VH with neurological symptoms were re-

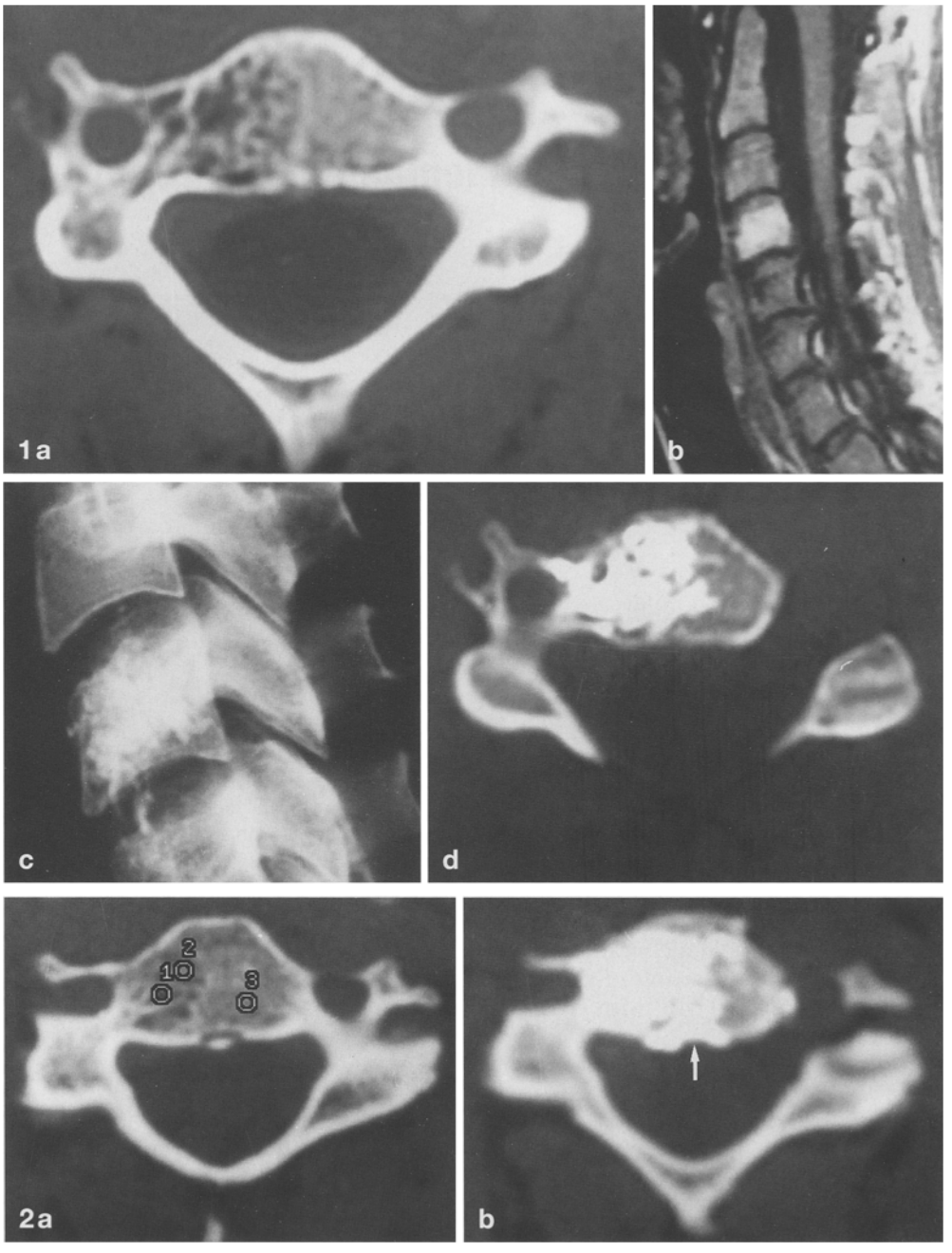

Fig. 1a–d Case 1. **a** CT through C4 shows a well-defined haemangioma, with normal cortex and neural arch. **b** Sagittal T1-weighted (SE 600, 20) MRI of cervical spine, before vertebroplasty. The lesion gives high signal. **c** Plain film after acrylic cement injection. **d** CT immediately after acrylic cement injection: filling of the lesion is complete

Fig. 2a,b Case 2. **a** CT through C4 shows the haemangioma involving the right side of the vertebral body. Normal cortex and neural arch are seen. **b** CT immediately after acrylic cement injection. Filling of the lesion is complete. Note leakage into the basivertebral veins *(arrow)*

lated to spinal cord compression (33/45 cases) or root entrapment. The two main causes were diffuse narrowing of the spinal canal or local bony expansion. Only 4 cases involved the cervical spine.

The choice of treatment depends on both clinical and radiological features. Fox and Onofrio [2] reviewed 59 VH, of which 13 were symptomatic presenting mainly with back pain. Follow-up data (average period 8.8 years) were available for 10 patients. All continued to complain of pain, but none developed a neurological deficit or further radiological changes. Of the 13 patient's 12 were successfully managed with conservative measures. It was recommended that patients with painful lesions should be checked annually and managed conservatively, with radiotherapy or with embolisation. None of these patients was treated with percutaneous vertebroplasty.

Laredo et al. [1] studied 58 solitary VH (4 involving the cervical spine) and suggested a radiological scoring system of aggressiveness based on the presence of six radiological features on plain radiography and CT: lo-

cation between T3 and T9; involvement of the entire vertebral body; extension to the neural arch; expanded cortex with indistinct margins; irregular honeycomb pattern; and soft tissue mass. A score 0–2 suggests inactive angiomatous dystrophy, requiring routine clinical and radiological follow-up. A score of 3 or more and/or the presence of radicular pain in the territory of the vertebral lesion raises the suspicion of an active VH and requires selective arteriography, followed by embolisation if indicated. In a more recent study using CT and MRI, Laredo et al. [4] tried to correlate the fat content of VH with their aggressiveness. Fatty VH may represent inactive forms, while soft tissue content on CT and low signal intensity on T1-weighted MRI may indicate a more active vascular lesion with potential to compress the spinal cord.

In our two patients there were no radiological criteria of aggressiveness. Both showed a well-defined lesion with regular trabeculation, involving only half of the body of C4 corresponding to grade 0, and had a predominantly fatty stroma. Nevertheless in case 1, the presence of a neuralgia in the corresponding territory raised the suspicion of an active VH. No evidence of radicular compression was observed on radiological examinations. The origin of the radicular pain was thus unclear. The relief of cervical pain following vertebroplasty suggests a knitting or solidifying of bone. An angiomatous lesion could have weakened the vertebral body, resulting in localised increased pressure or microfractures. In both patients significant improvement of symptoms was rapid. The first patient was able to work again. Clinical examination and plain film follow-up gave evidence of excellent short-term results (9 and 6 months' follow-up respectively). Longer term follow-up is needed to confirm these results.

Several therapeutic modalities could have been considered in our cases. Medical treatment failed to relieve the severe neck pain. Surgery and radiotherapy were not indicated in such small and radiologically inactive lesions. Intravascular embolisation was initially considered in case 1, but was not performed because of the absence of hypervascularity, furthermore, the lesion was supplied by branches of vertebral arteries, rendering embolisation potentially dangerous.

Vertebroplasty was then performed to treat the severe neck pain and neuralgia, despite the absence of radiological criteria of aggressiveness. The procedure of vertebroplasty is well known [5–9]. However, to our knowledge, there is no report of vertebroplasty in cervical VH.

Long-term complications could be related to a recurrence of the angioma, despite the initial fatty nonaggressive appearance and the apparent total filling of the lesion during acrylic cement injection. Acrylic cement has been used for a long time by orthopaedic surgeons with good results and safety. However, after years, degenerative change at the bone-cement interface has been reported after surgical treatment of the hip joint [10]. The formation of a layer of tissue at the bone-cement interface has been demonstrated in rat and dog models. The enzymatic activity of this tissue could be responsible for bone resorption and osteolysis [11].

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