Spontaneous chronic epidural hematoma of the lumbar spine mimicking an extradural spine tumour

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Received: 19 April 2012 / Accepted: 3 June 2012 / Published online: 21 June 2012
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Abstract

Purpose Spontaneous chronic epidural hematomas are extremely rare and can be extremely challenging to diagnose and differentiate. The clinical findings, computed tomographic scan and magnetic resonance imaging does not always enough to complete differentiate this condition. Our purpose is to report a case of a spontaneous chronic epidural hematoma presenting as an extradural mass leading to compressive radicular symptoms with images of bony scalloping which are sparsely reported in the literature.

Methods We describe a 61-year-old woman who was evaluated after 18-month history of pain, disesthesias and mild weakness in both lower extremities with significant radicular symptoms on the right side associated to neurogenic claudication.

Results CT scans revealed a nodular image of soft tissue density located in the right anterolateral epidural space at the L4–L5 level demonstrating resorption of the bony margins. MRI studies revealed a round mass in the vertebral canal displacing the dural sac and scalloping the posterior wall of the L4 vertebral body. Diagnosis was

established between a degenerative cyst versus an atypical neurinoma. Surgical findings demonstrated an isolated well-formed chronic hematoma.

Conclusion Spontaneous chronic epidural hematomas are rare, even more when they produce scalloping of bony structures becoming a diagnostic challenge. Therefore they should be always considered as a differential diagnosis in patients with extradural chronic compressions taking into account that also chronic epidural hematomas can cause bone involvement.

Keywords Tumour · Spine, epidural · Hematoma

Introduction

Epidural hematomas of the spine can produce compression of the surrounding structures, being of clinical relevance when they affect the spinal cord and/or a nerve roots (neurological elements). An acute epidural hematoma variety is a common complication in spinal surgery [1–3, 4], but those that result in a neurological deficit are extremely rare (0.1 %) [5]. The chronic variety is extremely uncommon [6]. The clinical features of a chronic lumbar epidural hematoma may be similar to those of a herniated nucleus pulposus or to those of lumbar spinal stenosis [7, 8]. The purpose of this article is to report a case of a spontaneous chronic spinal epidural hematoma in the lumbar spine and to discuss aetiology and physiopathological considerations of this clinical scenario.

Case report

History

A 61-year-old female presented to our hospital with an 18-month history of pain, disesthesias and mild weakness in

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both lower extremities with significant radicular symptoms on the right side. She also complained of mild neurogenic claudication. She denied previous lumbar trauma, spine surgery or other spinal disorders. She had a history of breast cancer 3 years previously and is status post-breast resection, receiving adjuvant chemotherapy with a complete eradication of the disease. On physical exam, she had right-sided decreased sensation in the L5 distribution with radicular pain in this dermatome. She was treated with anti-inflammatory medications and physical therapy. Complete resolution of the symptoms was seen within a few weeks. Four months after the resolution of the symptoms, she started to experience radicular pain in both legs, right greater than the left side. She denied any history of lumbar trauma. She complained that her current pain increased with coughing and defecation.

Examination

Physical exam revealed a normal lumbar range of motion, and the absence of musculotendinous reflexes in the lower limbs without motor deficit or sphincter disturbance. CT scans were obtained revealing a nodular image of soft tissue density located in the right anterolateral epidural space at the L4–L5 level demonstrating remodelling of the bony margins (Fig. 1). Sagittal T1 and T2 MRI studies revealed a round mass in the vertebral canal displacing the dural sac and scalloping the posterior wall of the L4 vertebral body. The lesion was isointense on T1-weighted sequences and did not enhance after gadolinium administration. The signal was plainly hypointense and homogeneous on T2-weighted sequences and in the report, the

differential diagnosis was established between a degenerative cyst versus an atypical neurinoma (Figs. 2, 3). A bone scan revealed no abnormalities. Because of the clinical and radiological findings, a surgical procedure was recommended.

Operation

A midline posterior approach was performed and an L4 laminectomy was used to expose the spinal canal. During the surgery, the dural sac was found to be compressed by a well circumscribed, gray lesion, located in the right anterior space of the vertebral canal with no adhesions to the nerve roots, but to the dural sac. Under magnification, the lesion was incised, and it contained an isolated well-formed chronic hematoma that appeared to be under pressure. Excision of the thick capsule was performed and the posterior part of the vertebral body was exposed. We observed no disc herniation at the L4–L5 level.

Pathological findings

Histopathological examination reported a chronic encapsulated hematoma with reparative fibrous tissue without evidence of malignancy.

Postoperative course

The patient's postoperative course was uneventful and the patient was discharged home. The lumbar pain and the radicular symptoms disappeared completely since the last visit 2 years after surgical treatment.

Fig. 1 Coronal, transverse and sagittal cuts of lumbar tomography shows the bone scalloping over the posterior wall of L4 vertebral body

Fig. 2 T1 and T2 weighted lumbar MRI reveals a extradural and extraradicular isointense mass at the L4 level

Discussion

Epidural hematomas can occur from a variety of situations, and can be divided in acute and chronic. The former ones are common in spinal surgery but rarely produce neurological deficits. The chronic hematomas are extremely rare (0.1 %), being most commonly associated with multilevel surgery, coagulopathies, neoplasia, post lumbar puncture, or the use of high doses of anticoagulant medication [5, 9]. The source of spontaneous hematomas is not clear; hematomas seem to originate in the venous system due to the rupture of Batson's plexus [1–3, 5–7, 10, 11] and are apparently associated to anatomic arteriovenous anomalies which can produce changes in this epidural venous plexus [1, 12]. Wiltse et al. [13] described a fibrovascular sheath lying external to the dura called the peridural membrane which appears to be a homologue of the periosteum. This membrane surrounds the entire bony canal and lies between the posterior surface of the vertebral bodies and the posterior longitudinal ligament. It is approximately one-half the thickness of the dura and is not attached to the posterior longitudinal ligament except at the disc space, where it blends with the annulus fibrosus. Batson's plexus is a confluence of valveless veins that run longitudinally and lie largely on the dorsal surface of the peridural membrane, but penetrate it at several points to enter the vertebral body. Hematoma is thought to result from tearing of the epidural veins lying within this premembranous space.

It seems to be more likely that the appearance of chronic hematomas occurs in the conus medullaris because at this

level there are higher pressures in the spinal cord and their arteries [7, 14]. Apparently, tearing of the epidural veins occurs during an exertion, which increases the thoracic or abdominal pressure; the epidural blood plexus volume and pressure depend on the integration of the blood output between intracranial, intrathoracic and intrabdominal blood flow changes [6, 15]. Other authors estimate that the hematomas come from an arterial source [16]. Graziani et al. [17] thought that an epidural cavernous hemangioma could be the cause of some of these spontaneous hematomas.

The clinical symptoms of an epidural hematoma can be similar to herniated discs, spinal stenosis or spinal tumours [18].

In the CT images it can mimic an extruded disc, but it also depends on duration of existence of the chronic hematoma. Due to the chronicity of the hematoma, a local circumferential bone resorption (scalloping) of the posterior wall occurred, this is an exceptional image in this type of lesions [18], and have been sparsely reported in the literature (Fig. 3). A ventrally located hematoma should be differentiated from a posterior longitudinal ligament cyst as described by Toussaint [19]. The MRI images of a hematoma can simulate a intracanal tumour or a neurinoma. They also can be similar in appearance to an intracranial hematoma [6].

In the present case, the images obtained indicate a chronic type of hematoma [9]. We believe that in this case, a tear over a weakened or damage vein plexus occurred [12, 20, 21]. With the normal daily Valsalva manoeuvres, the hematoma appeared in a slow progressive manner,

Fig. 3 T1 weighted transverse section demonstrates the radicular and dural compression

related to a low pressure venous system [6, 15] eventually accumulating in size leading to a chronic hematoma which presented as compressive radicular symptoms due to its lumbar location [7, 14]. The findings in this case appear to support the theory of the venous origin of the chronic epidural hematomas, and also that they occur in the premembranous space from the Batson's plexus as described by Wiltse. This is further supported by the anatomic location of the hematoma, being at the dorsal portion of the vertebrae and immediately lateral to the posterior longitudinal ligament with no contact to the disc space without adherence to the roots or dural sac.

Conclusion

Although spontaneous chronic epidural hematomas are extremely rare, they become diagnostic challenge, even more when they produce scalloping of bony structures. Therefore they should be always considered as a differential diagnosis in patients with suspicion of extradural chronic compressions taking into account that also chronic epidural hematomas can cause bone involvement.

Conflict of interest None of the authors has any potential conflict of interest.

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