Case report

SPONTANEOUS CHRONIC SPINAL EPIDURAL HEMATOMA OF THE LUMBAR SPINE

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SUMMARY

We report an exceptional description of a spontaneous chronic spinal epidural hematoma presenting as lumbar radiculitis. The computed tomographic, magnetic resonance imaging, and intraoperative findings are presented. We discuss anatomical and pathophysiological considerations that could lead to such a condition. We estimate that spontaneous spinal epidural hematomas located in the ventral space are in fact premembranous or posterior longitudinal ligament hematomas.

Key words: spontaneous spinal epidural hematoma, computed tomography, magnetic resonance imaging, posterior longitudinal ligament.

INTRODUCTION

Epidural hematoma in the region of the spinal cord produces dramatic signs of cord compression leading to early diagnosis and treatment. Spontaneous spinal epidural hematoma of the chronic variety is uncommon. The clinical features of a chronic lumbar epidural hematoma may be similar to those of a herniated nucleus pulposus or to those of lumbar spine stenosis [3, 11]. The purpose of this article is to report a case of spontaneous chronic spinal epidural hematoma at the lumbar level and to discuss anatomical and physiopathological considerations that could lead to such a condition.

CASE REPORT

This 70-year-old woman was admitted to our institution on November 18, 1996, with a chief complaint of pain in both legs.

Approximately half and one year before admission, she experienced a brutal right leg pain as she was walking. She had no pathological medical history. A t first examination, his family physician found an isolated posteroexternal pain in the right leg with paresthesia on the dorsal face of the foot. There were no back pain, no motor or sensitive deficit and no sphincter disturbance. CT scan revealed a soft tissue density located in the right anterolateral epidural space at the L4-L5 level (figure 1). She was treated with medications and physical therapy. Complete recovery of symptoms was obtained in few weeks.

About 8 days before admission, she began to experience radicular pain in both legs, greater in the right one. She denied any history of trauma to his back. Pain increased with coughing, defecation and during the night. At examination, lumbar spine revealed a normal range of motion, and there was no tenderness to palpation. The deep tendon reflexes were absent in the lower extremities with no more deficit. The coagulation studies were within normal limits. The patient underwent MRI examination of the lumbar spine. Sagittal T1 and T2 — and axial T1 — weighted sequences were performed (figures 2a and 2b). These studies revealed a round well-limited 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 there was non enhancement after Gadolinium administration.
The signal was plainly hypointense and homogeneous on T2-weighted sequences (figure 2c).

Because of the importance of the pain, the patient underwent a surgical procedure on 21 November 1996. A midline posterior approach was performed to realize a laminectomy of L4. The dural sac was compressed by a well circumscribed gray and steady lesion, located in the right anterior space of the vertebral canal (figure 3). Under magnification, the lesion was incised, containing an isolated underpressured hematoma. Excision of the thick capsule was entirely performed and the posterior part of the vertebral body was exposed. We observed any disc herniation at the L4-5 level. Histological examination of the specimen demonstrated an old organized blood clot with hemosiderin in pigment and fibroblast infiltration. There were numerous collagen bundles and some elastic fibers in the capsule of the hematoma. Postoperative course was uneventful and the patient was discharged on the 8th day.

**DISCUSSION**

Hematomas below the level of the conus medullaris are more likely to be chronic because the spinal roots appear to tolerate pressure better than the spinal cord and its arteries [3]. Spinal epidural hemor-

**FIG. 1.** — CT scan reveals a soft tissue density mass located in the right anterolateral epidural space. The CT density may be similar to that of an extruded disc.

**FIG. 2.** — MRI images of a rounded epidural hematoma at the L4 vertebral body level.

a) Sagittal, T1-weighted SE image (TR/TE : 780/17) : ventral epidural isointense mass located at the mid-vertebral body level.

b) Sagittal T2-weighted fast SE images (TR/TE : 4700/128) : compressive hematoma, hypointense and homogenous.

c) Axial, T1-weighted SE image (TR/TE : 550/12) through the level of the L4 pedicles : large encapsulated hematoma in the vertebral canal scalloping the posterior wall of the vertebral body.

**FIG. 2.** — IRM d’un hématome épidural arrondi en regard du corps vertébral de L4.


b) Coupe sagittale en fast spin écho pondéré en T2 (TR/TE : 4700/128) montrant un hématome compressif, hypointense et homogène.

c) Coupe axiale en spin écho pondéré en T1 (TR/TE : 550/12) passant par les pédicules de L4 et montrant un volumineux hématome encapsulé dans le canal vertébral érodant le mur postérieur du corps vertébral.
The source of bleeding in spontaneous hematomas has never been clear, but has been presumed to be venous [3, 7, 8]. Abnormalities or pathologic changes in the extensive epidural venous plexus may give rise to symptoms mimicking lumbar disc herniation, spinal stenosis, or tumor [9]. The majority of spontaneous hematomas results from a rupture of the posterior internal vertebral venous plexus called Batson’s plexus [1, 7].

Wiltse et al. [14] studied the gross and microscopic anatomy of the most important structures in the vertebral canal. The ventral wall of the vertebral canal is lined in its medial part by the posterior longitudinal ligament. There is a fibrovascular sheath lying external to the dura and 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 toughness of dura and is not attached to the posterior longitudinal ligament except at the disc space, where it blends with the anulus 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 which penetrate it at several points to enter the vertebral body. We agree with Gundry’s and Wiltse’s hypothesis [8, 14] who consider the hematoma result from tearing of the epidural veins lying within this premembranous space. Unlike these authors, we consider that the dorsal displacement of the disc is not essential for tearing epidural veins. Therefore, hematomas located ventrally in the epidural space at the lumbar level are presumed to be premembranous hematomas. Toussaint et al. [13] described a new entity called cyst of the posterior longitudinal ligament which are looking like premembranous hematomas.

The epidural plexus may be considered as a volume/pressure regulating system between intra-abdominal, intrathoracic, intracranial and intraspinal changes in volume and pressure of the circulating blood [4]. Therefore, an increase in abdominal and thoracic pressures during exertion provides excessive blood pressure in the valveless epidural veins which may tear. Others estimate that the hemorrhage may originate from an arterial source even if the cause of the spontaneous rupture of a small epidural artery remains unclear [2]. Graziani et al. [6] consider that the frequency of spinal epidural cavernous angiomas is probably undervalued. The inability to reveal an angioma by pathological examination, not necessarily means that such lesions can not be pointed out as the cause of hemorrhage. The failure to visualize these malformations could be related to the small size of these anomalies or to thrombosis after the initial episode of bleeding.

The CT appearance of the hematoma may be similar to that of a large extruded disc, and a chronic spinal epidural hematoma may mimic a disc if it is small and located near the disc space [8, 9, 12]. The MR imaging characteristics of epidural hematomas are variable and are probably related to the timing of imaging relative to the age of the hematoma [8]. Rothfus et al. [11] assume that spinal epidural hematomas display an appearance similar to that of the intracranial hematomas. In our case, there was not sequentially imaged over time to determine if signal intensity characteristics were similar to those of hematoma occurring in the brain [5]. Scalloping of the posterior wall of the vertebral body is quite unusual in such a lesion. To our knowledge, this finding has never been described before. The time from clinical presentation to MR imaging may explain this condition. This lesion is very amenable to treatment which consists in laminectomy and total removal of the encapsulated hematoma. However, we expect that in some cases, this described entity may account for some spontaneously resolving cases of lumbar radiculitis. These probably account for some of the classical concealed «phantom discs» of Dandy.

Spontaneous chronic epidural hematomas are rare. If they are located in the ventral space, the
term of premembranous hematoma or hematoma of the posterior longitudinal ligament seem to be better appropriate.

REFERENCES