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A MINIMALLY INVASIVE VERTEBRAL HEMANGIOMA

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We describe a very unusual vertebral hemangioma presenting with a mixture of aggressive-like pattern (epidural extension , T1 hyposignal) and quiescent, inactive lesion (fatty infiltration), in association with a spiculated calcified epidural component. This paper emphasizes that CT and/or MR findings are accurate enough to make formal assessment of vertebral hemangioma, preventing patient's anguish and moreover unnecessary treatment. Furthermore this attractive case proposes a poorly known characteristic of vertebral hemangioma which is usually encountered and described only in skull hemangiomas.

Key-word: Angioma, skeletal system.

Vertebral hemangioma is a common skeletal angiomatous benign tumor. The one we describe shows an extraordinarily spiculated calcified intra-canalar extension. This gives a "sunburst" appearance to the lesion usually encountered in skull hemangiomas. The aim of this report is to highlight a poorly known sign which, despite its partial aggressive look, should not hinder the assessment of a typical benign hemangioma by the radiologist.

Case report

A 51-year-old patient complaining of chronic neck pain was referred for a cervical spine MRI. Cervical findings were unspecific, but a wide lesion was found at the T5 level, extending from the vertebral body to both pedicles, with a posterior small epidural component that contains some calcifications.

On sagittal T2 weighted images (Fig. 1, 2), the bone marrow of the T5 body was hyperintense compared to the other vertebrae and was not collapsed. The lesion extended posteriorly in the ventral epidural space. The adjacent disks appeared normal.

Whereas the vertebral body on T2 weighted images was homogenously hyperintense, it showed a dual appearance on T1 weighted images (Fig. 3): isthmi and the anterior half body were hyperintense, relating a quiescent fatty marrow, while the posterior vertebral body was hypointense, due to a greater vascular soft tissue component and maybe some inflammatory process.

Contrast enhancement (Fig. 4) was mainly seen in the posterior part of the lesion, but also in the components located in the anterior epidural space and in the paravertebral lateral soft tissue. The enhancement also accentuated the mineral structure of the vertebral body presenting a diffuse coarse pattern, with fewer but thicker hypointense trabeculae.

Computed tomography confirmed the thickened pathognomonic bone trabeculations throughout the hemangioma (Fig. 5A), but also showed speculated calcifications at the posterior aspect of the lesion in the anterior epidural space (Fig. 5A,B). This appearance, often described for skull hemangioma, is quite rare in the vertebral ones.

Fig. 1. — Sagittal T2-weighted MR-image. The vertebral body T5 is homogeneously hyperintense, compared to other vertebrae.

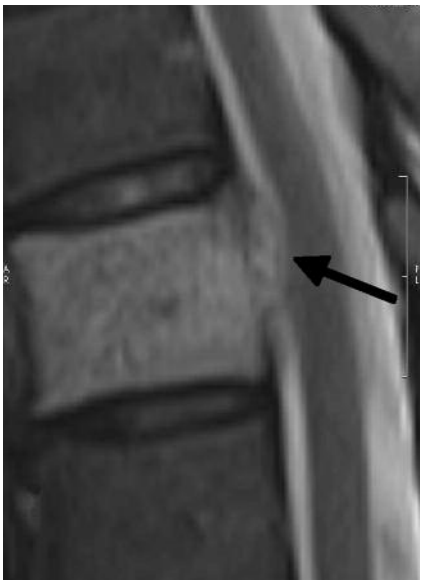

Fig. 2. — Sagittal T2-weighted MR-image. (enlarged view). Obvious destruction of the posterior vertebral wall, towards epidural space (black arrow).

Discussion

The vertebral hemangioma is a well known benign tumor found in 11% among a wide series of autopsy (1, 2). It is also acknowledged that the lesions of the spine are mostly located at the thoracic level (2).

These hemangiomas are asymptomatic, excepted for 1% of them which are invasive. Less than five percent of asymptomatic hemangioma become neurologically relevant (3). The sex ratio is 3:2 favouring female (4).

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Fig. 3. — Sagittal T1-weighted MR-image. The vertebral body presents a dual appearance: a bright front part, fatty-filled tissue (white star), and a hypointense posterior vertebral body, with evolutive components.

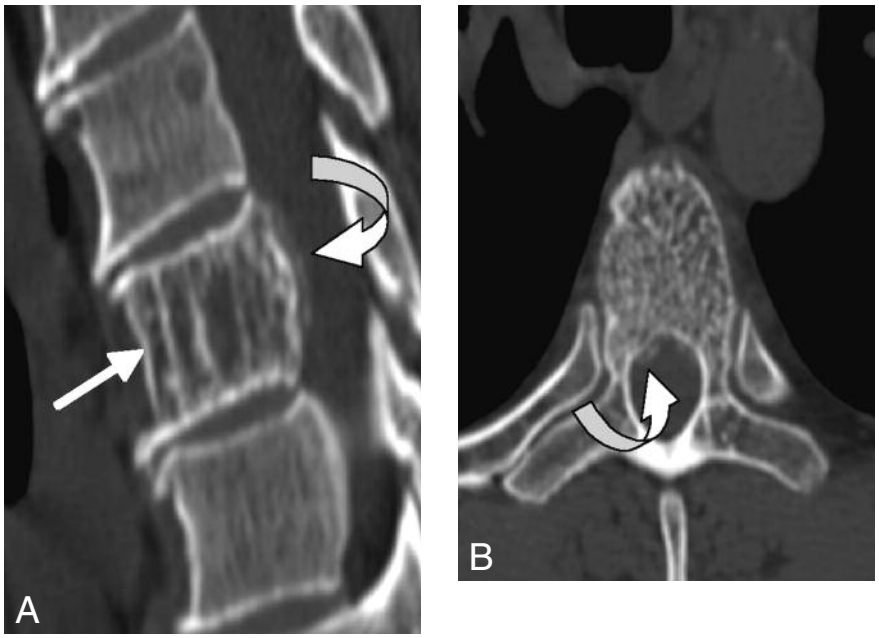

Fig. 5. — Respectively sagittal (A) and axial (B) reformatted CT images. Typical thickened trabeculations and hypodense, fatty components confirms the diagnosis of a common vertebral haemangioma (white thin arrow). CT scan reveals also the 'sunburst' calcifications (curved arrows) of the extra-osseous components as for hemangioma of the skull.

Fig. 4. — Axial T1-weighted Gadolinium enhanced MR-image. The dorsal displacement of the posterior longitudinal ligament (and epidural venous plexi), which is medially strongly attached to the vertebral wall, gives a bilobular intracanalar aspect commonly called the "curtain sign" (large white arrow). The "polka dot" pattern is also recognized by numbers of black dots (mineralized trabeculation) in a bright environment. Note that the enhancement of the hemangioma is mainly posterior rather than anterior.

CT findings emphasize what can be seen on plain radiographs (5, 6), namely the honeycomb pattern, giving the typical 'jail bar' aspect on maximum intensity projection (MIP) sagittal reconstruction. This results from the thickening of the vertical trabeculae. On cross section, the same phenomenon determinates a 'polka dot' pattern (4, 7).

The stroma between these osseous reinforcements is either filled with fatty and/or with angiomatous tissue, giving respectively a high or low intensity on T1 weighted MR images (8) and a different attenuation form on CT images. Laredo et al. (9) investigated a series of invasive, clinically relevant, hemangiomas. They have stated that the loss of activity ('aggressiveness' in their cases) increases with the predominance of fatty components. It had been previously observed (2) that the nature of the active tumoral part, shows a preponderance of angiomatous and fibrous tissue, with only few adipose stroma. This contributes to the variable intensity signal level on T1 weighted MR images, lower in the epidural components that contains as a result, more angiomatous tumoral tissue. This epidural involvement is limited by a strong medial fixation of the posterior longitudinal ligament. The lesser lateral fixation of this ligament allows it to be displaced by the tumoral tissue, resulting on axial slices in a 'curtain sign' (10).

Into the skull, bone hemangiomas often present a soft tissue expansion with some spiculated new bone formation, giving a "sun ray" appearance on tangential views (11). The invasive portions of the lesion often tend to expand externally but may also grow intracranially towards the dura (12). This seems to happen in our case, but at the thoracic level. Although the surgical way with histological assessment is classically the clue in the diagnosis of skull bone hemangiomas, this is not the case for those of the spine. Indeed, the radiological appearance of vertebral hemangioma is most of the time clear enough to avoid surgery, unless symptoms occur.

Our patient presented a complex hemangioma, the anterior part of the body being quiescent while the posterior part was still active. It had an active epidural space which contained some osseous components, unusual at the spine level (13). Nevertheless, it is completely asymptomatic and does not compress the neural cord. The radiological features were moreover doubtlessly for the diagnosis of benign vertebral hemangioma, and we decided to stop there the investigation.

Conclusion

Vertebral hemangioma is a common lesion often described by many authors. Our report is atypical on many aspects. Our hemangioma shows a dual appearance with inactive and hypervascular, active parts. Furthermore, there is an asymptomatic soft tissue extension in the epidural space. Finally, this extension contains calcifications which are well-described for skull hemangiomas but are very rare at the spine level.

Despite these uncommon features, the well-known radiological semiologic findings including the famous 'polka dot' pattern allowed us a formal diagnosis of a benign vertebral hemangioma and avoided unneeded anguish and treatment.

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