Aggressive Hemangioma of the Thoracic Spine with Cord Compression: A Case Report

Mohammad Zaraei¹, Mehdi Vahar¹, Mohammed Javad Dehghani Firoozabadi¹,* and Furqan Mohammed Yaseen Khan¹

¹Orthopedics Department, Joint Reconstruction Research Center, Imam Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran
*Corresponding author: Mohammad Javad Dehghani Firoozabadi, Tehran University of Medical Sciences, Imam Khomeini Hospital, Orthopedic Research Center, Tehran, IR

Received 2017 July 26; Revised 2017 August 20; Accepted 2017 September 20.

Abstract

Vertebral hemangiomas are common neoplasms of the spine and usually considered benign. They are usually asymptomatic and incidentally detected. A rare subset of them, referred to as aggressive hemangiomas, can be symptomatic presented with pain and neurological symptoms. The current study presented a case of a 27-year-old female with a four-month history of pain in thoracic spine and neurological involvement of the lower limbs for three weeks before the visit. Further investigations with computed tomography (CT) scan and magnetic resonance imaging (MRI) showed aggressive hemangioma in T4 vertebra with cord compression. The patient underwent laminectomy of T4, posterior fixation of T2-T6 and vertebroplasty. Final pathologic diagnosis after surgery confirmed the diagnosis of vertebral hemangioma. One month after surgery, the patient’s motor symptoms and three months later, sensory symptoms were resolved.

Keywords: Hemangioma, Spine, Spinal Cord Compression, Surgery

1. Background

Vertebral hemangiomas are the most common benign tumors of the spine, with an incidence rate of 10% - 12% in the general population (1, 2). Very few are reported in pediatric population (3). They are usually asymptomatic and incidentally discovered; 0.9% - 1.2% of cases are symptomatic and called aggressive hemangiomas. Symptoms may vary from neurological deficits in 45% of the cases to simply pain in the remaining 55% (1, 4, 5). Symptomatic hemangiomas, especially with neurological involvement, usually occur in the thoracic area whereas asymptomatic cases are usually in the lumbar region (6).

The current study presented a rare case of aggressive vertebral hemangioma in the thoracic spine with myelopathy symptoms due to the stenosis of the spinal canal and cord compression.

2. Case Presentation

A 27-year-old female referred to the orthopedic clinic with a four-month history of occasional back pain in thoracic spine and also decreased sensation and weakness of both lower limbs for three weeks before the visit. She was able to walk and there was no history of bladder or bowel incontinence and also no history of trauma or previous diseases.

On physical examination, the patient was generally stable. Mild tenderness was observed at the spinous process of T3, T4, and T5 thoracic vertebras. Sensory and motor examinations of the upper limbs were normal. There was reduction in the sense of touch and impaired sensations below the T8 level in right lower limb, but the left side had normal sensation. Muscle strength decreased in both lower limbs to grade 4/5. The examination also revealed heightened patellar and Achilles reflexes and positive clonus and Babinski on both sides. There were no abdominal reflexes. Perineal sensation and anal sphincter tone were normal.

After taking a plain X-ray (Figure 1), the patient was examined for spinal magnetic resonance imaging (MRI) (Figure 2) due to the neurological deficits. On MRI, involvement of the entire T4 vertebra was evident along with the involvement of posterior elements, especially the pedicle, the transverse process, and the right lamina, which caused the stenosis of the spinal canal in the area. MRI showed no soft tissue involvement, but there was epidural extension, although the cord signal was normal.
Due to the fact that the lesion was not typical and non-differentiated from malignant tumors and metastases, the patient was subjected to thoracic computed tomography (CT) scan (Figure 3). Vertical coarse trabeculae with corduroy or honey comb view were observed in sagittal and coronal cuts, which is typical for hemangiomas. Axial cuts showed Polka dot view along with involvement of pedicle, transverse appendages, right lamina, and all the body of vertebrae. There was also a spinal cord stenosis in the T4 area.

Regarding the presence of myelopathic symptoms, the patient underwent decompression surgery with a T4 laminectomy and posterior fixation of T2-T6 along with vertebroplasty during surgery (Figure 4). Vertebroplasty, performed through the left pedicle, was interrupted due to right pedicle involvement with mild cement leakage from the right pedicle. The removed sample from posterior elements was sent for pathologic investigation.

The patient was ambulated one day after surgery. Lower limbs power gradually returned to normal one month after surgery and after three months, impaired sensation was resolved. Histopathologic evaluation showed thin-walled blood vessels, mostly filled with blood reported with low-fat tissue and interstitial bone spicules suggesting vertebral hemangiomas with normal vascular structures.
Hemangioma is one of the most common benign tumors of the spine, accounting for 2.3% of the total spinal tumors, and mainly observed in the thoracic and lumbar region (7). Hemangioma is usually asymptomatic and incidentally discovered (4). About 1% of cases may be symptomatic (aggressive hemangiomas) (1, 8), which present with merely pain or alongside neurological involvement. They are commonly found in the thoracic region and become symptomatic followed by mild trauma or at the end of pregnancy (third trimester of pregnancy) or even spontaneously (2, 6). Half of the cases show neurological symptoms within a month of back pain onset. However, in the current study patient, neurological symptoms appeared in the fourth month after the onset of pain. Hemangiomas are predominantly observed in the fourth and fifth decades of life and are more prevalent in females than males (1, 9, 10).

The characteristic of hemangioma in plain radiography and CT scan is the presence of vertical coarse trabecula associated with vascular proliferation in low-density stromal fatty acids. Its appearance is characterized by honey comb, corduroy in the lateral radiography or CT sagittal and coronal (1, 6, 8). Asymptomatic hemangiomas usually involve the vertebral body partly with posterior elements not involved. In symptomatic hemangiomas (aggressive), there is usually a whole-body involvement plus posterior elements along with bone expansion, soft tissue involvement and extension to the epidural space. On MRI of an asymptomatic hemangioma, due to the presence of abundant fatty tissue and high vascularity, it is observed in hyper intense in T1. If fat becomes aggressive, the vascularity reduces; as a result T1 turns into hypo and T2 to hyper (5, 6, 10). CT scan is the gold standard to diagnose hemangioma and shows the extent of the body involvement and posterior elements, the number of vertebrae involved and the presence of cord compression (4). It is also helpful to differentiate aggressive hemangiomas from metastases (1). On MRI, the aggressiveness of hemangioma and the amount of canal stenosis is measurable.

The Paget's disease, lymphoma, vertebral metastases, and primary tumors are considered as differential diagnoses of aggressive hemangiomas (1).

Clinically, hemangiomas are divided into four types: asymptomatic patients without aggression, asymptomatic with aggression, symptomatic without aggression, symptomatic with aggression (6). The asymptomatic patients do not usually require treatment, observation is sufficient. The symptomatic and aggressive type is rare and mostly requiring intervention (9). Therapeutic modalities include radiotherapy, intra-arterial embolization, percutaneous vertebroplasty during surgery, ethanol injection into the lesion, and other types of aggressive surgical methods. If neurological symptoms are present in the form of myelopathy, surgical procedures for neuropathic decompression should be performed immediately, other-
Figure 3. CT scan

wise other treatment modalities can be used according to different conditions (2).

Radiotherapy is not indicated if there is neurological involvement since it responds late and, as the edema increases, neurological involvement may be exacerbated (6, 10). Also, in case of possible unstable vertebrae, radiotherapy is preferable (6).

Embolization is only indicated in cases with neurological involvement (10) before surgery, angiography and, if possible, trans-arterial embolization (TAE) can also be performed. TAE reduces tumor vascularity, bleeding during surgery, and also the need for blood transfusions. With a better view of the tumor during surgery, it can be completely removed that reduces the recurrence. Embolization alone in cases where there is no neurological involvement can be considered as a primary and even curative treatment.

Percutaneous vertebroplasty is only used in cases where the pain is caused by intractable lesions, but there is no neurological involvement, which reduces and even removes the pain. Despite its excellent results, its complications include localized infection, pulmonary embolism, pedicle fracture, cement leak, and possible neurological complications (9).

Injection of cement in cases with neurological involvement should not be performed alone, except that it is conducted along with laminectomy and fixation during surgery or with delay after several weeks (10).

Injection of alcohol leads to intraocular thrombosis, endothelial destruction, revascularization, reducing the
size of the hemangioma and decreasing the pressure on the cord. The injection should be performed in the blood vessels of hemangiomas (10).

Decompression surgery can be performed by laminectomy or corpectomy. Laminectomy in cases of posterior elements involvement and epidural involvement can lead to temporary decompression in order to reverse neurological symptoms; since the main site of the involvement is the vertebral body, the possibility of recurrence is high, but the corpectomy can be both decompressive and curative. Along with laminectomy, especially when the vertebra is collapsed or unstable, the posterior fixation is recommended with pedicle screw, which is usually fixed with two levels up and down of the laminectomy site (8).

3.1. Conclusions

Vertebral hemangioma is usually asymptomatic, but rarely symptomatic that should be considered as a differential diagnosis in patients with tumoral lesions in the spine along with neurological symptoms. It requires a high index of suspicion and knowledge to be diagnosed and needs proper and rapid management to avoid complications. Patients with neurological involvement should be examined promptly with MRI, CT scan, and other necessary modalities for accurate diagnosis in order to make an appropriate therapeutic decision.

References


