A CASE OF THORACIC VERTEBRAL OSTEOID OSTEOMA CAUSING CAUDA EQUINA SYNDROME

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Abstract

The objective of this study is to report a rare serious presentation of thoracic spine osteoid osteoma that caused compressive cord pathology with distal neurological deficit and cauda equina syndrome.

Osteoid osteoma of the spine is a relatively rare bone-forming tumor. Pain that is worse at night & relieved by aspirin and muscle contracture are the most characteristic symptoms of spinal osteoid osteoma. Although radicular pain occasionally occurs in spinal osteoid osteoma, spinal cord and nerve root compression is absent in most cases.

We present a 34 year old male who came with sudden bilateral leg muscle weakness, sensory deficit over the lower limbs for 3 days duration, and urine retention for the previous 6 hours. He was complaining of non-specific mid back pain over the previous 3 years that was responding to oral analgesia. A thoraco-lumbar MRI and CT scan revealed T10 vertebral arch osteoid osteoma, with cord signal change and compression secondary to the bony mass.

The bone tumor was excised along with the T10 right laminectomy, complete decompression of the cord segment had been achieved. The patient had complete recovery of his sensory, and urine function control with satisfactory motor power recovery after one year of the surgery.

In conclusion, spinal osteoid osteoma that presents with neurological deficit is rare. Accurate diagnosis is possible. Spine MRI is the key diagnostic tool, particularly in the presence of neurological deterioration. Complete decompression and excision of bony benign tumor result in excellent outcome.

Key words: osteoid osteoma, spine bone tumor, laminectomy, Cauda Equina syndrome

Introduction

Up to 25% of all osteoid osteomas are found in the spine, of which 60% are located in the lumbar spine, 27% in the cervical, 12% in the thoracic and 2% on the sacrum1. An osteoid osteoma in the spine shows a 70% to 100% propensity for posterior element involvement2. The basic microscopic pattern in osteoblastoma and osteoid osteoma is bone-forming tumor containing numerous osteoblasts producing osteoid and woven bone3. In comparison to osteoid osteoma, osteoblastoma has more aggressive characteristics and often forms extra-skeletal bone in the soft tissue4. Osteoid osteoma causing acute cord compression with distal neurological deficit, and clinical picture of Cauda Equina Syndrome is a rare presentation.

Material and methods

A 34 year old male patient presented to the emergency room complaining of paraparesis, lower limb paresthesia of 3 days duration, and urine retention for the past 6 hours with progressive back pain. He stated that his back pain started gradually over the past 3 years that was responding to oral analgesia but with the absence of any further symptoms.
On examination
- He had impaired sensory function below T10 dermatome region.
- Saddle region paresthesia
- Motor power grade 3/5 to both lower limbs in all muscle groups.
- Positive clonus sign and spasticity to the right and left ankles.
- Hyper reflex response for ankle and knee reflexes bilaterally.
- Positive Babinski sign
- Weak anal tone.

Ultrasound of the bladder revealed a residue of 600mls. MRI done to the thoraco-lumbar spine, revealed small oval bony lesion of low T1, low SPIR, and low T2 signal seen at the right pedicle and lamina junction at T10 level measuring 12×10×9 mm suggestive of osteoid osteoma. This boney mass displacing the cord showing diffuse high T2 signal opposite to T10/11 segment suggestive of myelomalacia (Figure 1).

CT Scan was also done to confirm the bony nature of the lesion and its dimension (Figure 2).

Open posterior surgical decompression of the cord by right laminectomy and excision of the bony tumor of T10 vertebrae was performed within 48 hours of presentation. The bony lesion that had been excised was sent for histopathology examination. Post decompression surgery, the patient showed dramatic restoration of normal sensory and urine control function. Regarding motor power, he showed gradual improvement over 6 months and was able to walk with one stick; due to remaining weakness at his right hip flexor muscle group. At one year follow up, he
was able to walk independently with power of 4+ over right hip flexors.

**Histopathology results**

On gross examination, a mottled and gritty lesion, which was distinct from the surrounding bone present in the medullary canal. Osteoclasts are present. The nidus is surrounded by sclerotic bone with thickened trabeculae. Microscopically, the nidus consists of a combination of osteoid and woven bone surrounded by osteoblasts (Figure 3).

**Discussion**

Osteoid osteoma and osteoblastoma are benign bone tumors with similar histological features showing osteoblastic bone formation. These two lesions simply are separated on the basis of size. A lesion with a nidus of 15 mm or less in diameter is diagnosed as an osteoid osteoma, whereas an osteoblastoma typically is larger than 15 mm⁵. Therefore, it is important to distinguish between these two tumors. The lesion in our case was diagnosed as an osteoid osteoma because it measured 12 mm × 10 mm × 9 mm.

Pain is the primary complaint in 83% of patients, it is worse at night with awakening in nearly 30%, and is relieved by aspirin in 27%. Because of the location in the posterior elements, radiculopathy occurs in 28% of patients⁶. Pain is the primary complaint in 83% of patients, it is worse at night with awakening in nearly 30%, and is relieved by aspirin in 27%. Because of the location in the posterior elements, radiculopathy occurs in 28% of patients⁶.

Typical symptoms of osteoid osteoma such as night pain and pain relief with aspirin are reported to occur only in one half to two thirds of patients⁷. The classical history may not always be elicited in axial skeleton lesions, leading to long diagnostic delays of up to 1-2 years, especially complex anatomy structures like spine⁸.

Surgery is the most common treatment for this disease (osteoid osteoma) and the prognosis after total resection is favorable. The recommended treatment for osteoid osteoma causing disabling pain and spinal deformity is excision. The most important determinant for successful removal of the tumor is its exact localization⁹.

We believe this case report is a rare presentation of spinal osteoid osteoma with such remarkable neurological deficit and cord compression. We think this bony lesion had started gradually over the preceding 3 years with a history of nonspecific mid back pain that was relieved by simple analgesia without any neurological deficit or disabling pain. Over time the lesion size was gradually increasing in size until it reached a sufficient size neurological deficit, and acute Cauda Equina syndrome. A significantly better outcome was found in patients who were continent of urine at presentation compared with those who
were incontinent. The duration of symptoms prior to surgery does not appear to influence the outcome{10}.

**Conclusion**

Osteoid osteoma of the spinal posterior elements can present with devastating neurological deficit, a Magnetic Resonance Imaging and CT scan to the spine are helpful in localizing the lesion. Wide open decompression and excision of osteoid osteoma has excellent outcome.

**References**