CASE REPORT

Intercostal neuralgia as a symptom of an osteoblastoma in thoracic spine

Hiroshi Kobayashi,¹ Yusuke Shinoda,² Takahiro Ohki,¹ Hirotaka Kawano¹

¹Department of Orthopaedic, The University of Tokyo Hospital, Tokyo, Japan
²Department of Rehabilitation, The University of Tokyo Hospital, Tokyo, Japan

Correspondence to
 Dr Hiroshi Kobayashi,
 hkobayashi-ty@umin.ac.jp

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SUMMARY

An osteoblastoma is a benign bone lesion most commonly affecting the spine; it is frequently found in the posterior elements of the vertebra. When an osteoblastoma originates in the spine, it usually causes dull and localised dorsal pain, but the period between symptom development and diagnosis can be long. MRI shows intense peritumoural oedema accompanying the osteoblastoma. We present a case of a 15-year-old boy with osteoblastoma at the level of the T8–9 left laminae causing intercostal neuralgia without direct invasion to the intercostal nerve. Immediately after surgery, intercostal neuralgia was diminished. To our knowledge, this is the first case of an osteoblastoma with intercostal neuralgia, which is possibly the key symptom for diagnosing an osteoblastoma in the thoracic spine.

BACKGROUND

An osteoblastoma is a rare and benign primary bone tumour that accounts for 1–3% of all primary bone tumours.¹ One-third of osteoblastoma cases arise in the spine, and lesions are frequently found in the posterior elements. The most common initial complaint related to an osteoblastoma in the spine is dull and localised dorsal pain, but there can be a long period of time between the development of symptoms and diagnosis.² Early diagnosis is essential for relieving pain and decreasing the risk of structural spinal deformity. We present a case of a boy with an osteoblastoma located at the T8–9 left lamina-transverse process junction leading to intercostal neuralgia without direct invasion of the intercostal nerve.

CASE PRESENTATION

A 15-year-old boy was referred to a local hospital with pain in the back and left chest after practising Judo. He was diagnosed with contusions because plain radiographs revealed no abnormalities. He was treated with non-steroidal anti-inflammatory drugs, which reduced his symptoms. However, 3 months later, the dorsal pain with intercostal neuralgia relapsed and he was referred to our hospital. We noted that the left chest pain occurred at rest, and was not caused by lateral movements of the trunk or vertebral column.

INVESTIGATIONS

Plain radiographs of the anteroposterior thoracic spine revealed an oval expansile lesion about 4 cm in diameter on the T8–9 vertebrae which thinned the cortex (figure 1). CT of the thoracic spine showed an osteolytic lesion with an expansile and

thin cortex at the T8–9 vertebrae left lamina-transverse process junction (figure 2A, B). MRI of the thoracic spine revealed a bone lesion located on the T8–9 vertebrae, as was shown on CT. There were hypointense signals on T1-weighted imaging and highly intense signals on T2-weighted imaging, concordant with intense oedema in the paravertebral soft tissues, in the bone marrow of the vertebrae where the lesion was located and in adjacent vertebrae. Gadolinium-based contrast imaging revealed a homogeneous enhancement in the lesion, and medullary bone marrow enhancements were seen on adjacent bone structures. Intense enhancement was observed on soft tissues around the truncus, on the left T7–9 nerve roots and paravertebral soft tissues adjacent to the lesion (figure 3A–D). Direct invasion by the tumour to the intercostal nerve was not observed.

Figure 1 Anteroposterior view of thoracic X-ray shows expansile oval rim of the cortex (arrow) in left T8–9 vertebra.

Figure 2 (A) Axial view of CT shows an osteolytic lesion with expansile and thin cortex in T8 vertebra left lamina-transverse process junction. (B) Sagittal view shows the lesion extends to the superior aspect of T9 vertebra lamina.

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Figure 3 (A) T1-weighted, (B) T2-weighted fat suppression and (C) contrast-enhanced T1-weighted fat suppression preoperative sagittal views of MRI, show a destructive lesion on posterior parts of T8–9 vertebra with intense oedema in the paravertebral soft tissue, especially in the intervertebral foramina, and in the bone marrow of vertebra. (D) T1-weighted fat suppression axial view reveals that the tumour does not invade the spinal canal and shows marked enhancement of rib, vertebral body and soft tissue beyond the tumour.

DIFFERENTIAL DIAGNOSIS

- ▶ Herpes zoster infection
- ▶ Diabetic polyneuropathy
- ▶ Vertebral facet joint osteoarthritis
- ▶ Dislocation of the costovertebral joint (Tietze's syndrome)
- ▶ Direct invasion of the tumour, especially metastatic tumours

TREATMENT

We performed an operation through the dorsal approach to resect the thin expansile cortex in the posterior T8–9 lamina-transverse process and curettage of the greyish tumour with high-speed burring. On histological examination, the tumour contained osteoid trabeculae rimmed by osteoblasts embedded in the vascular stroma. Thus, the tumour was diagnosed as an osteoblastoma.

OUTCOME AND FOLLOW-UP

The intercostal neuralgia disappeared soon after the operation. A follow-up at 10 months showed no recurrence, and there was no

dorsal pain (figure 4A, B). On MRI, peritumoural oedema on MRI was diminished after the surgery (figure 5A, B).

DISCUSSION

We presented the case of a boy with an osteoblastoma located on the thoracic spine leading to intercostal neuralgia without direct invasion of the intercostal nerve.

Intercostal neuralgia is often related to herpes zoster infection,³ diabetic polyneuropathy,⁴ vertebral facet joint osteoarthritis and dislocation of the costovertebral joint (Tietze's syndrome).⁵ In addition, the intercostal nerves can be involved by direct invasion of the tumour, especially metastatic tumours occurring with mediastinal, paravertebral or costal lesions.⁵ In the present case, these conditions were not seen, and the tumour did not compress the nerve root.

Neuralgia caused by inflammatory cytokines has been reported in autoinflammatory disease, and interleukin-1 has been considered to play an important role in the development of neuropathic pain.⁶ An osteoid osteoma, a small benign osteoblastic tumour with a nidus that highly expresses cyclooxygenase-2, located in the T1 vertebra, has been reported to lead to brachial neuralgia symptoms.⁷ It has also been reported that oedema surrounding the osteoblastoma demonstrated by MRI is correlated with prostaglandin levels of the primary bone tumour.⁸ In the present case, oedema in the paravertebral soft tissues and left T7–9 nerve roots was prominent. Furthermore, intercostal neuralgia was diminished soon after surgery; therefore, we considered that the intercostal neuralgia was derived from inflammatory cytokines produced by the osteoblastoma.

An osteoblastoma is rarely present in young, immature individuals, and dorsal pain caused by a tumour can be observed for a long time as non-specific back pain, but in the case of dorsal pain with intercostal neuralgia, osteoblastoma should be considered as a differential diagnosis.

Figure 4 Axial (A) and sagittal (B) views of postoperative CT show no

Figure 5 T1-weighted (A) and T2-weighted (B) MRI reveal that oedema in the paravertebral soft tissue, especially in the intervertebral foramina, is diminished after the surgery.

Learning points

- ▶ When osteoblastoma, a rare and benign primary bone tumour, occurs on the spine, it can be mistaken for non-specific back pain.
- ▶ Intercostal neuralgia could be caused by inflammatory cytokines produced by osteoblastoma in the thoracic spine without direct compression of the nerve root.
- ▶ Intercostal neuralgia may be a key symptom for diagnosing osteoblastoma in the thoracic spine.

Contributors HK, YS, TO and HK were involved in the treatment of the patient and reviewing and editing of the manuscript. HK was also involved in the writing of the manuscript.

Competing interests None declared.

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