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CASE REPORT

Rare Cause of Back Pain in a Paediatric Patient with Aneurysmal Bone Cyst: An Illustrative Case

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ABSTRACT

Spinal tumors are rare in the pediatric age. The most common symptoms of spinal tumors are neck, back, and waist pain. Diagnosis is often delayed in patients presenting with nonspecific symptoms (e.g. pain). Spinal tumors can cause mortality and significant morbidity due to bone damage, vascular involvement, and cord and nerve root compression. In this article, we present a 9-year-old male who complained of back pain for 3 months and was admitted to the emergency room with acute monoplegia which is diagnosed as an aneurysmal bone cyst at the level of the third thoracic vertebra. For patients who present with pain; a detailed history and careful neurological examination are important for diagnosis. Magnetic resonance imaging should not be delayed if there is any doubt. Aneurysmal bone cysts should be considered in the differential diagnosis.

Keywords: Child, back pain, bone cysts, spinal neoplasms

INTRODUCTION

Spinal tumours rarely seen in the paediatric population (1). A wide variety of findings depending on the biological characteristics of the tumour and its location, spread, and size can be observed. Neck, back, and waist pain are the most common symptoms for spinal tumours. Night pain, localised pain, and pain not induced by activity should be carefully examined for spinal tumours (2,3). Progressive motor loss, progressive scoliosis, gait disorders, and paraspinal muscle spasms are the most serious neurological symptoms. Spinal tumours are classified by their anatomical location; extradural tumours, intradural extramedullary tumours, and intramedullary tumours (1). Most commonly extradural tumours can be seen in the paediatric population. Diagnosis is often delayed due to nonspecific findings and its rarity. Significant morbidity due to bone damage, vascular involvement, and cord and nerve root compression can emerge (4). In this report, we present a paediatric patient who complained of back pain for 3 months and was finally admitted to the emergency department with acute monoplegia. The diagnosis was an extradural spinal tumour at T3 vertebra level. The patient operated in an emergency setting. The pathological examination was compatible with an aneurysmal bone cyst. Our aim in this study was to pay attention to spinal tumours that are very rare in childhood. Although it is rare; understanding the characteristic of spinal tumours and early diagnosis is necessary for proper management, improving outcomes and the chance of cure in children.

CASE REPORT

A previously healthy 9-year-old male was admitted to our emergency department with complaints of loss of sensation in his right leg and inability to move and walk, which started suddenly. No history of trauma or illness. He had mild back pain for 3 months; it did not affect his daily activities. There was no family history of neurological disease. Anthropometric measurements of weight and height were 50 kg (98 percentile due to World Health Organisation), 150 cm,, respectively. The patient's vital signs were in the normal range. On neurological examination, the cranial nerves were normal. Upper extremity bilateral muscle strength was 5/5, right leg muscle strength was 2/5 and left leg muscle strength was 4/5. He had hypoesthesia under the T4 dermatome. The lower extremity deep tendon reflexes were hyperactive bilaterally. The left

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Babinski reflex had a neutral response, and the right Babinski reflex was positive. The rest of the physical examination was unremarkable. Laboratory examination; completed blood counts, electrolyte, lactate dehydrogenase, uric acid, creatine phosphokinase, B12, folic acid, and coagulation parameters were within the normal range. Spinal magnetic resonance imaging sagittal non-fat-suppressed sequence T1-weighted precontrast (figure 1a) and postcontrast (figure 1b) revealed an expansile mass lesion at the T3 vertebral body that expanded in the corpus and protruded into the spinal canal and posterior elements. The mass extended into the neural foramen and caused a pathological fracture. The lesion showed similar signal characteristics to the muscle (figure 1a). Heterogeneous contrast enhancement was observed in the mass (figure 1b). Non-fat-suppressed sequence T2-weighted; the mass was heterogeneously hyperintense (figure 2). Fluid-fluid levelling was shown in the posterior part of the lesion (arrow). The peripheral blood smear and bone marrow aspiration evaluation were normal. Computed tomography of the thorax and abdomen taken for evaluating metastatic lesions revealed no pathology. The imaging showed that the vertebral mass primarily suggests bone-derived tumoral pathology. The patient was operated on in an emergency setting. The mass lesion involving the lamina, right pedicle, and partially corpus of the thoracic 3 vertebrae with significant paravertebral spreading was explored by T3 total and T2 partial laminectomy. A mostly extradural paravertebrally spread mass lesion was observed. The mass lesion excised grossly and totally. Because the right pedicle of the T3 vertebrae was excised and partial corpectomy was performed, thoracic posterior segmental transpedicular stabilisation was also performed. The pathological examination was compatible with an aneurysmal bone cyst. After the post-operative physical therapy and rehabilitation process, his lower extremity muscle strength was completely resolved at the end of the first year. There was no new tumoral lesion observed on spinal magnetic resonance imaging, and neurological examination was normal during the control examinations.

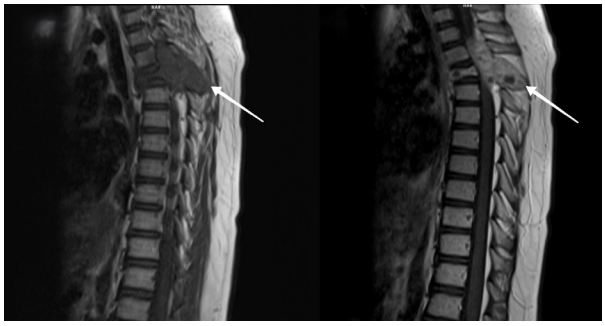

Figure 1: (a) Non-fat-suppressed precontrast T1W; (b) Non-fat-suppressed postcontrast T1W.

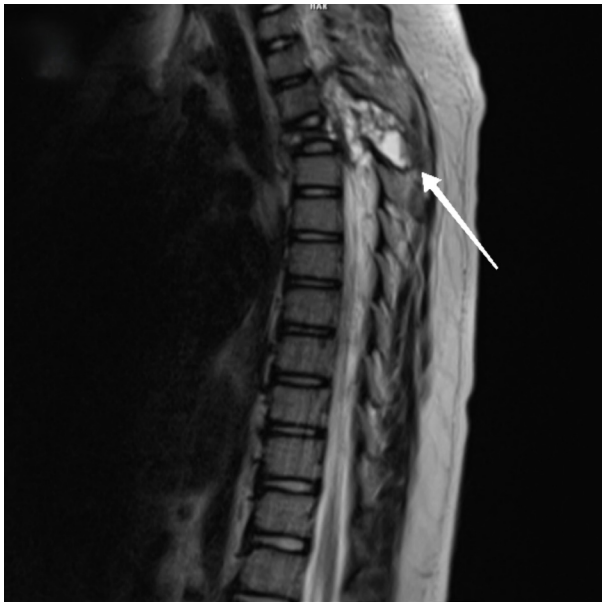

Figure 2: Non-fat-suppressed sequence T2W.

DISCUSSION

Extradural spinal tumours constitute approximately 30% of paediatric spinal tumours (5). Extradural spinal tumours may arise from the epidural space, vertebral bone and cartilage tissue, or paravertebral tissues (6). Extradural spinal tumours are mostly primary tumours arising from the bone elements of the spine (7). In our case, the tumoral lesion originated from the vertebral bone tissue.

Spinal tumour cases may present with a wide variety of clinical findings (4). Back pain is observed in 80% of children with spinal cord compression (8). Spinal tumours should be considered in cases of persistent pain that increases with movement (9). In healthy children without a history of trauma, back pain primarily suggests growing pains (10). Furthermore, paediatric back pain is common, but it is commonly associated with active and sedentary lifestyles, deconditioning, and excess body mass index. More than 80% of back pain in children is benign and mechanical in nature and resolves within 2 weeks with a natural course or conservative treatment (11).

The differential diagnosis for a paediatric patient presenting with back pain is extremely varied; muscle strains, stress, acute fractures, lumbar disc herniations, infections (especially tuberculosis in the epidemic region), rheumatologic causes (sacroilitis, ankylosing spondylitis), and although relatively rare; both bone-related malignant (Ewing sarcoma and osteosarcoma) or benign tumours (aneurysmal bone cyst, osteoid osteoma and osteoblastoma) and haematologic neoplasms (leukaemia and lymphoma) can occur in and around the spine in children (12). If back pain is not relieved with treatment, it should be examined carefully, including complex imaging, laboratory studies, and counselling as indicated (4). Our patient had back pain unrelated to blunt trauma for about 3 months. His family considered it as myalgia due to sedentary lifestyles, excess body mass index, or growing pains. They had never applied to a hospital for this complaint.

Spinal column pathology symptoms in paediatric patients vary depending on the location of the lesion (13). Cervical and thoracic spine tumour compression of neural tissue may cause upper motor neurone symptoms such as; paresis, hypertonia,

hyperreflexia, Babinski sign, sensory deficits, or myelopathy. Tumour compression or invasion in the lumbar and sacral region can be diagnosed with lower motor neurone symptoms such as; hypotonia, hyporeflexia, and bowel or bladder dysfunction. Young children and babies can present only with regression in motor skills, slow developmental progress, and agitation (14). Our patient had a sudden onset loss of muscle strength, sensation, and hyperreflexia on the lower extremity, and Babinski was positive.

The radiological gold standard evaluation method for spinal tumours is magnetic resonance imaging with or without contrast. It is important to imaging the entire spinal region with magnetic resonance imaging in the paediatric population (4,10). Computed tomography is useful in evaluating bone pathologies and identifying calcifications. However, in the paediatric population, whole spine imaging with computed tomography is contraindicated due to high radiation exposure (1). In our case, the tumoral lesion was diagnosed by whole spinal magnetic resonance imaging. After our patient was diagnosed with a spinal tumour, abdominal and thorax computed tomography was performed to investigate the metastatic lesions.

It is important to remove the spinal pressure by tumour excision in patients presenting with neurological deficits. The time between the onset of symptoms and surgical intervention is essential for neurological recovery. After surgical intervention, an improvement in neurological findings was observed in 50% of paediatric patients (8). The aim of surgery should be spinal and nerve root decompression and preservation of spinal stability. To avoid the recurrence of benign spinal tumour's important to remove the lesion completely during surgery (15). Our patient was operated on urgently by the department of neurosurgery. After the operation, the physical therapy and rehabilitation process was started. At the end of the first year, his neurological deficit was completely resolved.

Aneurysmal bone cyst is a benign, extradural blood-filled cystic bone neoplasm with a broad spectrum of skeletal involvement. The annual prevalence is 0.32 per 100,000 in the paediatric population and 0.14 per 100,000 in the general population. It is a rare neoplasm, accounting for approximately 2.5% of all bone tumours. It is most common in patients with incomplete skeletal development, especially in the first two decades. Although it can affect any bone in the body, craniofacial bones, vertebrates (especially the posterior elements), and the metaphyses of long tubular bones in the extremities are more commonly affected. Patients usually present with pain and swelling at the site of the lesion. Rarely, the first symptom is a pathological fracture; particularly in the extremity's major long tubular bones. Vertebral lesions mainly cause compression of the spinal cord or nerve roots. The diagnosis is made based on clinical, radiographic, and histological findings. Local recurrence occurs in up to 1/3 of the cases, especially within a few months after the first treatment, but recurrence after 2 years is very rare (16). Our patient's pathological examination was compatible with an aneurysmal bone cyst, and his age was in the first decade; like in the literature. Our patient presented with compression symptoms caused by a vertebral lesion; which is a bone frequently affected by aneurysmal bone cysts. No recurrence was observed in our patient during the 2-year follow-up.

CONCLUSION

Back pain without trauma may be due to spinal tumours in the paediatric age group. Detailed history and careful neurological examination are important in patients presenting with back pain. The early diagnosis of spinal tumours is essential for mortality and morbidity. Magnetic resonance imaging should not be delayed in cases of suspected spinal tumour lesions. Aneurysmal bone cysts should also be considered in the differential diagnosis of spinal tumours.

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