Case Report

Spinal osteochondroma: A rare cause of spinal compression – A case report and review of literature

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ABSTRACT

Osteochondroma is a common benign bone tumor, but spinal involvement is rare. They are rare in the spine, with frequencies ranging from 3% for solitary forms to 7–9% for multiple forms. We report a rare case of spinal osteochondroma in an 18-year-old male presenting with difficulty in walking. Imaging revealed well-defined growth with cortical and medullary continuity with parent bone, arising from the right-sided pedicle of T1, encroaching adjacent vertebrae, compressing the spinal canal, suggesting osteochondroma. The patient underwent extraperiosteal excision using an ultrasonic scalpel. Although rare, spinal osteochondroma should be considered in the differential diagnosis of myelopathy. Timely surgical intervention can lead to excellent outcomes.

Key words: Benign bone tumor, Osteochondroma, Spine tumor, Surgical excision

Osteochondromas or osteocartilaginous exostoses represent the most common type of bone tumor, accounting for 20–50% of all benign bone tumors [1]. They are rare in the spine, with frequency ranging from 3% for solitary forms to 7–9% for multiple forms associated with hereditary multiple exostoses, which is an autosomal dominant trait [2]. Spinal osteochondromas account for only 1–4% of all osteochondromas and <3% of benign spinal tumors [2]. They present unique diagnostic challenges owing to their location, onset, and indistinct appearances on radiographs. Although the tumor is benign, surgery is often required if it causes neurological complications.

We write this report to present a case of osteochondroma, which was managed successfully with surgery, confirmed through biopsy, and had an uneventful post-operative course.

CASE PRESENTATION

An 18-year-old male presented to our outpatient department with a chief complaint of difficulty walking, feeling of tightness in muscles, including stiffness in spinal motions, and performing fine motor activities such as buttoning, combing, and holding objects, which began 2 months before evaluation and progressively worsened to the point of requiring support for ambulation and for daily life activities.

Access this article online	
Received - 02 October 2025 Initial Review - 12 October 2025 Accepted - 15 January 2026	Quick Response code
DOI: 10.32677/ijcr.v12i2.7894	

The patient reported having a fair activity level before the onset of symptoms, including regular walking, running, and participation in sports. However, his symptoms progressed rapidly, from dull aching back pain, which was more at night and during rest, to ultimately resulting in an inability to walk and numbness below the waist and a change in posture due to stiffness. Notably, the patient denied any history of falls, paresthesias, or bowel and bladder involvement. His past medical and surgical history was unremarkable.

During examination, the patient had normal vital signs, and general examination revealed no abnormality. Neurological examination revealed signs consistent with upper motor neuron involvement. The patient exhibited a spastic gait, hypertonia in the lower limbs, exaggerated ankle and knee jerks, clonus, and a positive Babinski sign. The power and tone in the upper limbs were normal, although there was slight weakness of the extensor hallucis longus on the right side (4/5). Based on this, a provisional diagnosis of thoracic myelopathy was made, later confirmed by radiographic evaluation.

Anteroposterior and lateral radiographs were difficult to interpret due to the rare location of the tumor, but revealed a bony mass with well-defined margins extending from the T1 vertebrae. Computed tomography (CT) scan and magnetic resonance imaging (MRI) were done, revealing a well-defined growth with cortical and medullary continuity with the parent bone, arising from the right-sided pedicle of T1, encroaching on adjacent vertebrae, compressing the spinal canal, suggesting osteochondroma (Figs. 1 and 2) [3].

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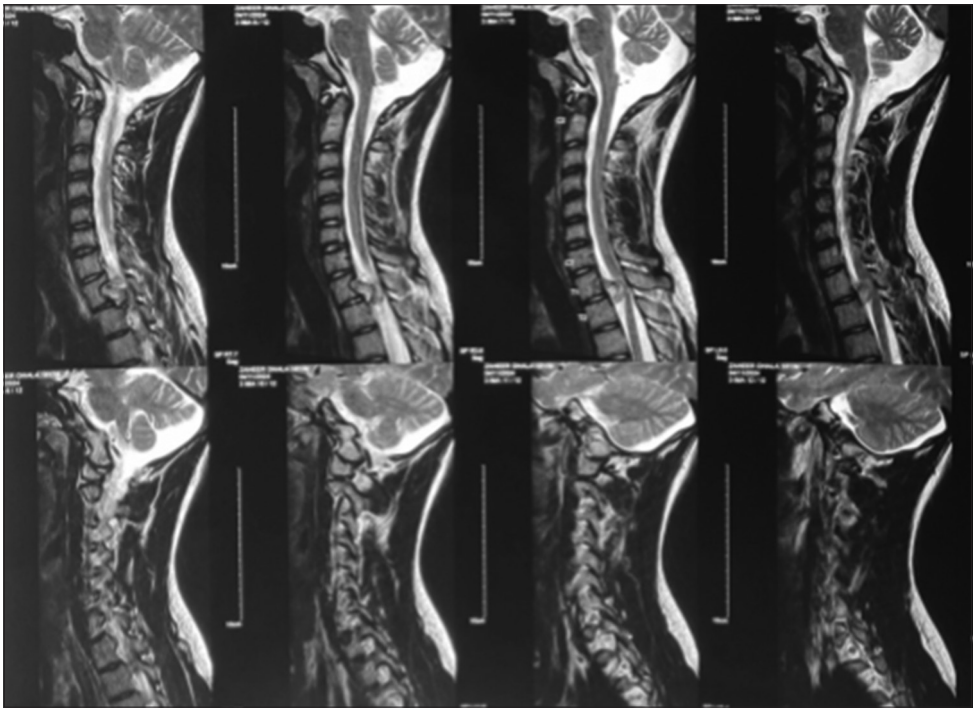

Figure 1: Sagittal T2 section of magnetic resonance imaging showing osteochondroma lesion arising from T1 vertebrae encroaching adjacent vertebrae causing spinal compression

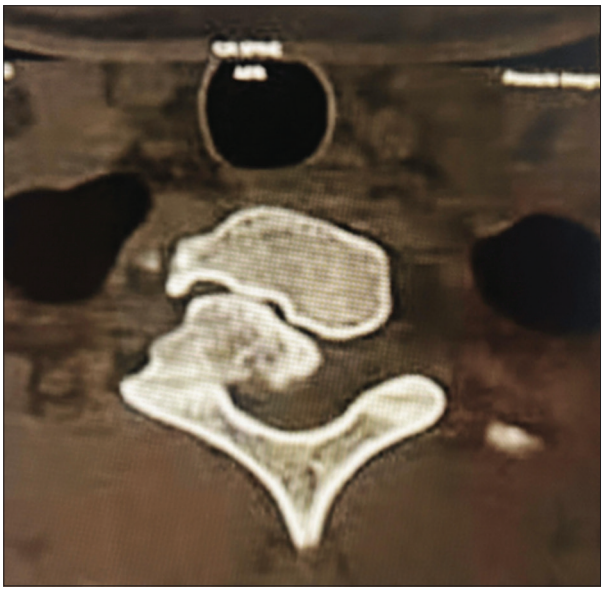

Figure 2: An axial computed tomography image shows a pedunculated osseous lesion arising from the right pedicle/ of T2 that is continuous with the medullary cavity, consistent with an osteochondroma. The lesion is extending into the central canal, causing severe central canal stenosis, spinal cord impingement, and right neural foramina narrowing

The patient was planned for extraperiosteal resection of the tumor, using an ultrasonic scalpel. T1-T2 Laminectomy was done, and the tumor was removed in pieces (Fig. 3). Tissue was sent for biopsy. The usage of intraoperative neuromonitoring was essential to prevent any impending neurological damage. No complications were noted during the intraoperative and post-operative periods.

The patient had an uneventful course in the post-operative period. The patient was mobilized the day after surgery with assistive devices. At the 3-month follow-up, the patient regained his power and tone and was able to ambulate without the use of assistive devices. At 1-year follow-up, the patient is comfortable and able to walk independently and has no upper motor neuron signs.

DISCUSSION

Osteochondroma is a cartilaginous neoplasm consisting of a cartilage-capped bony projection on the surface of bone, containing a marrow cavity that has continuity with that of the underlying bone [1]. Spinal osteochondromas account for only 1–4% of all osteochondromas and <3% of benign spinal tumors [4,5]. Osteochondroma is one of the most common bone tumors, accounting for 8.5% of all bone tumors and 36% of benign bone tumors [6]. Solitary spinal osteochondromas are uncommon, accounting for approximately 1–4% of all osteochondromas and comprising <3–4% of spinal tumors. The cervical spine is the most frequent site (~50%), particularly affecting C2, followed by C3 and C6 [7]. Solitary osteochondromas are non-inherited malformations.

An autosomal dominant inherited condition, multiple hereditary exostoses is characterized by the development of multiple osteochondromas throughout the skeleton [2]. Osteochondromas are painless cartilage-capped bony growths on either a broad base or a stalk, first appearing in relation to the epiphyseal growth plate. Thus, following the closure of the growth plates, osteochondromas usually stop growing. Osteochondroma primarily affects the growing bones and is commonly observed in younger patients. These lesions most often present in the second to third decades of life, with a male predominance, and a mean age of diagnosis around 30–32 years [8]. The pathognomonic finding is a bony outgrowth away from the epiphyses or its remnants over the metaphyseal region with cortical

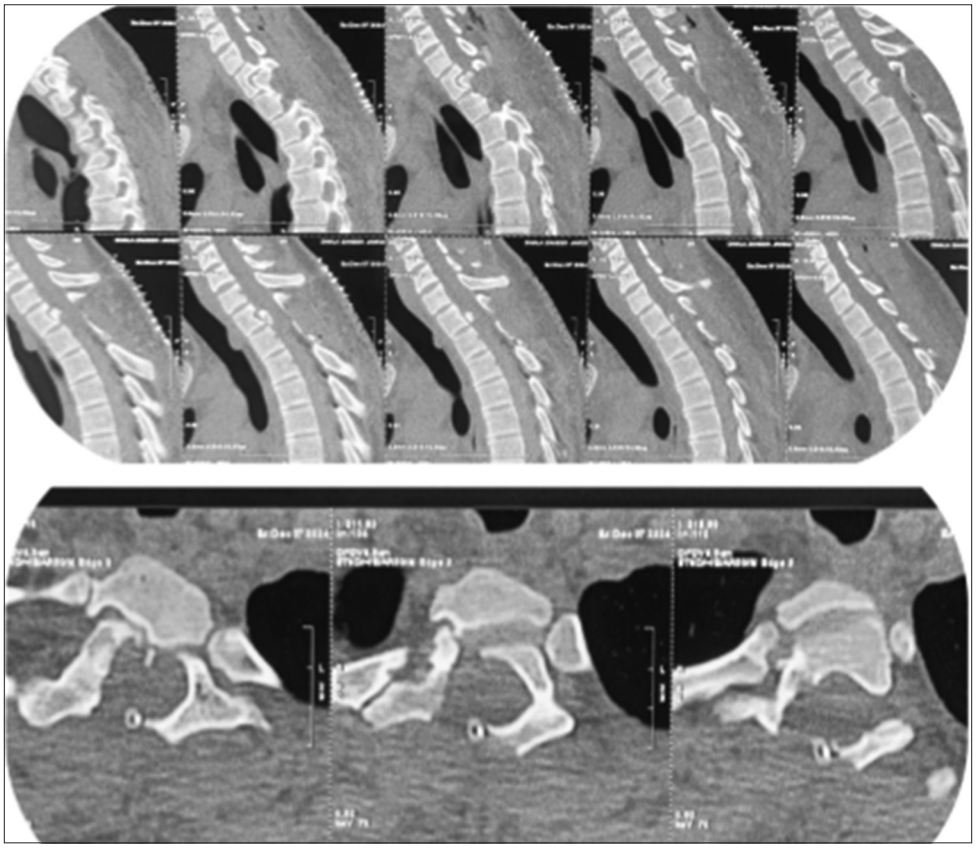

Figure 3: The illustration depicts (post-operative axial computed tomography scan) removal of osteochondroma tissue through laminectomy, and creation of space in the canal

and medullary continuity between the host bone and the lesion [9].

Clinical manifestations of osteochondroma can vary widely depending on the location of the tumor and its relation with surrounding structures. Symptoms of spinal cord compression usually arise when the patient is in the second or third decades of life. Although most spinal osteochondromas are asymptomatic, about 0.5–1% may cause radiculopathy or myelopathy due to spinal cord compression, typically presenting in young adults [10].

Imagining modalities includes plain radiographs that have lower rates of diagnostic ability compared to CT and MRI scans. Furthermore, CT scans and MRI demonstrate cortical and medullary continuity [9]. It is also important to show the exact location of the lesion and its relation to the spinal canal and foramina. On MRI, the cartilage cap can be identified, as well as soft tissue involvement and nerve root and other anatomical structure compression. The lesion appears on MRI as a heterogeneous lesion comprising both bone and cartilage. Malignant transformation is suspected by the growth of the osteochondroma after the growth plate closure and by the CT and MRI of a cartilage cap higher than 2 cm [9]. Surgical management involves complete surgical excision, including removal of the cartilage cap. Recurrence remains low (2–8%), largely dependent on completeness of excision; cases with intralesional resection show higher recurrence rates (~11–33%) compared to en bloc resection (~2%). Long-term data from a 27-patient multicenter series over 15 years confirm no tumor-related mortality and low recurrence [11].

Although malignant transformation is uncommon (<1%) in solitary cases, a cartilage cap thickness exceeding 2 cm in adults should prompt concern for chondrosarcoma, and it demands close follow-up [9].

CONCLUSION

Although rare, spinal osteochondroma should be considered in the differential diagnosis of myelopathy. Timely surgical intervention can lead to excellent outcomes in such cases.

CONSENT

Informed consent for treatment and open access publication was obtained or waived by all participants in this study. PD Hinduja hospital Mumbai, issued approval. Ethical approval was not required for a single case report as per the institution's policy.

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Funding: Nil; Conflicts of interest: Nil.

How to cite this article: Chouhan A, Kumar N, Aravinth M, Johri T, Dalvie S. Spinal osteochondroma: A rare cause of spinal compression – A case report and review of literature. Indian J Case Reports. 2026; 12(2):96-99.