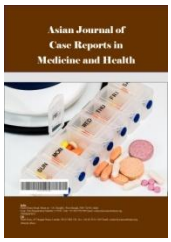

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Solitary Cervical Osteochondroma with Neurological Symptoms: Case Report

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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Case Report

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ABSTRACT

Osteochondromas are among the most common benign tumors of the bone. They mostly arise from the metaphysis of the long bones in the first two decades of life. Involvement of the flat bones is uncommon and the involvement of the small bones of hands and vertebrae are extremely rare. We report a 42-year-old male patient who presented with neck pain, numbness and weakness of left arm. Radiological images revealed a solitary, well defined, bony lesion in the cervical canal between C1-C2 arches. Excisional biopsy was performed. Histopathological examination of the specimen was in consistent with the clinical diagnosis of osteochondroma. We conclude that this rare tumor of the cervical spine can cause serious neurological symptoms and the total excision of the lesion assures a good outcome.

Keywords: solitary; osteochondroma; osteophytes; neurological; numbness; extradural; cervical spine.

1. INTRODUCTION

Osteochondromas are common benign bone tumors that accounts for approximately 35% of benign bone tumors and 10% of all bone tumors [1]. They occur usually in the metaphysis of the long bones in the first two decades of life with slight male predominance [1]. Involvement of the femur > humerus > tibia are the commonest. Flat bones such as iliac bone and sternum is

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uncommon. However, involvement of small bones of the hands and feet, ribs and vertebra is extremely rare [2].

Osteochondromas can occur as solitary sporadic tumors or as multiple tumors like in hereditary exostoses (MHE) [2]. Clinically, they are often asymptomatic. They may cause symptoms due to fracture, growth or impingement of other structures. We present a case of a cervical spine osteochondroma that is inside the cervical canal between the arches of C1-C2 and was causing pressure on the cervical nerves presenting as neck pain, numbness and weakness of the left upper arm.

2. CASE PRESENTATION

On 10th November 2021, 46 year old male, smoker, a known case of vitamin D deficiency, presented to our main tertiary care hospital (Salmaniya Medical complex) accident and emergency department with history of neck pain radiating to both upper limbs with left upper limb numbness and pain for the last 6 months with recent exacerbation of pain. On physical examination, patient is afebrile complaining of persisting upper neck pain radiating to both upper limbs with increasing pain and numbness in the left upper limb. He has minimal upper limbs weakness. He was admitted to the hospital for a suspected herniated cervical spine disc. Patient's initial labs were all within normal limits, his electrolytes were normal as well. Patient was taken for a cervical spine MRI (Fig. 1) and computed tomography studies (Fig. 2) and the tests concluded that the patient has a C1 - C2 well defined, solitary, extradural, bony lesion protruding in to the cervical canal with mild cord compression and spinal canal stenosis.

After that, patient was admitted to the neurosurgery ward, and a scheduled surgery for the excision of the lesion was performed. Intraoperative finding was an extradural cervical spine lesion measuring 1.4x1.4x1.2 cm at the level of C1-C2 protruding from the posterior arches of C1 cervical vertebra. So the patient underwent posterior spinal fusion with laminectomy and level C1-C2 Cervical spine extradural lesion resection under general anesthesia with no complications.

The resected lesion was sent to pathology department for microscopic examination.
The postoperative course was uneventful and the patient's symptoms improved shortly after surgery. Full recovery was achieved without any residual neurological deficit.

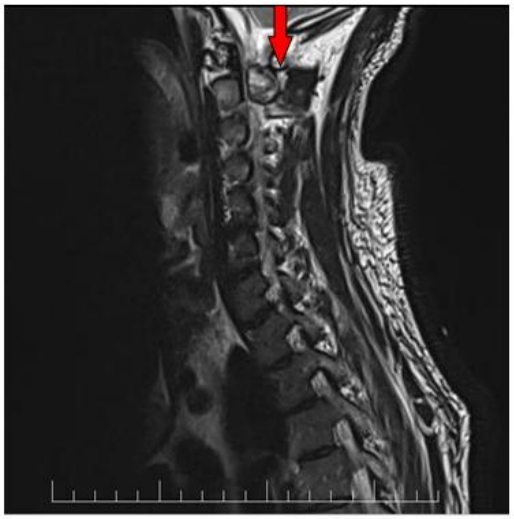

Fig. 1. Preoperative T2-weighted MRI showing severe cord compression by an extradural hypointense lesion originating from posterior arch of cervical spine C1 (arrow)

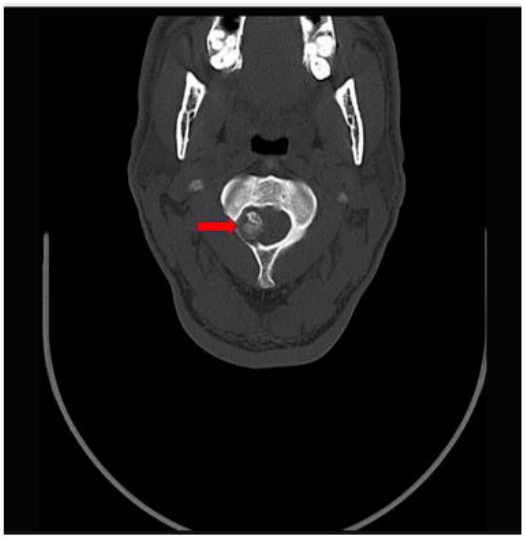

Fig. 2. Preoperative axial CT scan revealing the variably hyperdense lesion originating from posterior arch of C1 with intraspinal, extradural growth (arrow)

2.1 Histological Findings

The histological diagnosis was made on hematoxylin and eosin stained slides. Sections of the resected lesion were evaluated through routine light microscopy examination. Histologically, the lesion composed of fragments

of mature cartilage overlying viable bony trabeculae with fatty marrow.

There was no evidence of any noted cytological atypia ((Fig. 3. A and B).

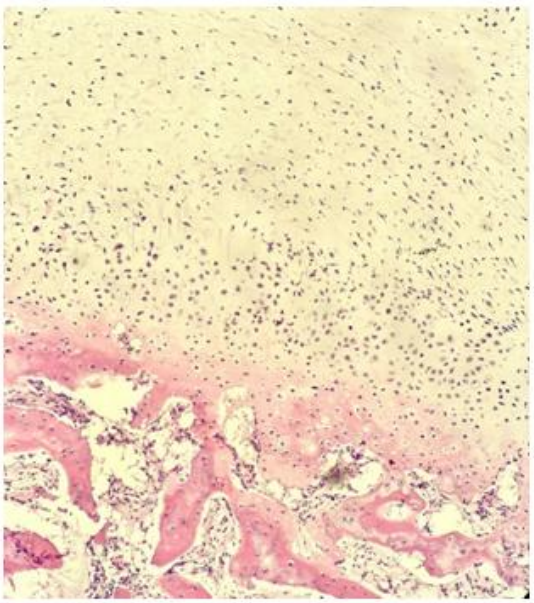

Fig. 3. A. Hematoxylin-eosin-stained sections of the lesion. Mature cartilage overlying viable bony trabeculae with fatty marrow confirms the diagnosis of Osteochondroma (Magnification × 20/0.08 NA)

3. DISCUSSION

Osteochondromas (also known as osseocartilaginous exostosis) according to The World Health Organization (WHO) classification of bone tumors are benign cartilage forming neoplasms that are relatively common. They account for 10-15% of all bone tumors and approximately 35% of all benign bone tumors [3]. Although it is well known about them being benign bone tumors, some authors consider them as developmental anomaly [3]. These tumors are most of the times asymptomatic with benign nature and has a very low malignant potential if it was sporadic and solitary.

Osteochondromas emerge during childhood (period of rapid skeletal growth) usually in the metaphysis of the long bones [4]. These tumors once developed, they do not regress. Moreover, they usually remain for the rest of the individual's life if it is not resected. They can occur at any age and are most of the times discovered incidentally. Osteochondromas are usually solitary and develop sporadically. However, few syndromes may have multiple osteochondromas such as hereditary multiple exostoses (HME) also known as diaphyseal aclasis [5] and Trevor disease: also known as dysplasia epiphysealis hemimelica [5].

These tumors most frequently arise from the appendicular skeleton, especially in the femur bone and around the knee joint. Osteochondromas of the lower limbs accounts for 50% of the cases with the most commonly involved bone is the femur (especially distal):30%, followed by proximal tibia:15-20% of the cases [6]. Humerus bone also involved commonly by these tumors: 10-20% [6]. Vertebrae of the spine is less commonly involved with osteochondromas. However, the posterior arches of the vertebrae, especially the cervical spine vertebrae are not rare site for these tumors [6].

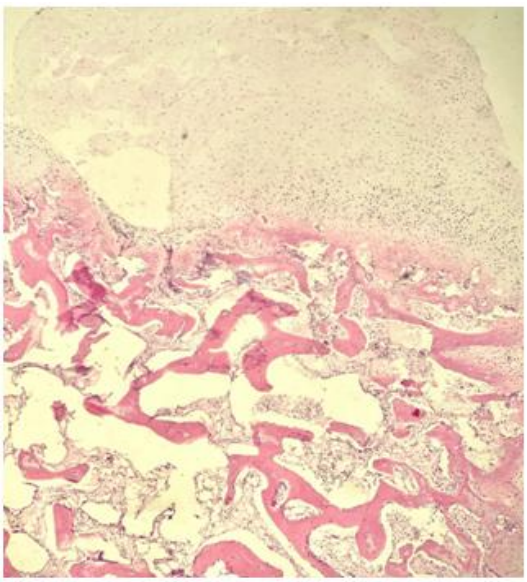

Fig. 3. B. Hematoxylin-eosin-stained sections of the lesion. Mature cartilage overlying viable bony trabeculae with fatty marrow confirms the diagnosis of Osteochondroma (Magnification × 10/0.08 NA)

Presentation of these tumors is due to the symptoms. The latter can be either mechanical effects of the lesion, fracture, or malignant transformation [7]. Clinically, cervical spine osteochondromas can cause mechanical symptoms due to its extradural location and nerve compression in the spinal canal. Fractures occur typically in the lesion itself, especially in the attachment point to the main bone

[7]. Moreover, malignant transformation of the tumor can present by increasing of the size of the lesion that indicate rapid growth and/or pain at the site of a previously non-tender lesion [7].

Histopathologically, these tumors are considered as cartilage forming neoplasm and are essentially a part of the normal bone growth plate which detaches and continues growing independently away from the nearby joint without an associated proper epiphysis. That explains the theory of this lesion being a developmental anomaly. In the classic morphology of the oesteochondroma, there is usually a trabecular bony growth with medullary cavity that is in continuous with the parent bone with a notable amount of mature hyaline cartilage capping them [8]. Osteochondromas can grow spontaneously or can be congenital or can develop following trauma or insult including previous irradiation [8]. Malignant transformation of these tumors are very rare and it can occurs usually in the cartilage cap giving rise to chondrosarcoma. That usually develop in the solitary osteochonrdomas (~1%), whereas in the setting of syndromes such as hereditary multiple exostoses the rate of malignant transformation is higher (5-25%) [8].

These tumors can be confidently diagnosed by different radiological modalities such as Plain radiograph, Ultrasound, Computed tomography (CT scan) and Magnetic resonance imaging (MRI) [9,10]. Plain radiograph can give us idea regarding sessile (broad base) or pedunculated (narrow stalk) lesions found on the surface of bones. Whereas MRI is the best imaging modality to assess cartilage thickness (and thus assessing for malignant transformation), the presence of edema in bone or adjacent soft tissues, and visualizing neurovascular structures in the vicinity [9,10,11].

Prognosis is usually excellent. As in most instances, no treatment is required unless the osteochondroma is causing symptoms (neurological symptoms of numbness and pain like in our case). In these circumstances, it should be totally resected to relief the symptoms and to prevent future recurrence [9,10]. If malignant transformation occurs (~1% in solitary osteochondromas and ~5-25% with hereditary multiple exostoses) then the resultant chondrosarcoma is usually of low grade (67-85% of cases), and surgery is usually curative (70-90%)[9,10]. Local recurrence is seen in both benign and malignant lesions, due to spillage of cartilage cells into the resection bed. Rates are estimated at 2% and up to 15% respectively [11,12].

There are many differential diagnosis of osteochondroma and that depends on its location. In cervical osteochondroma, the close differential diagnosis is osteoma. Herniated cervical intervertebral disc will give the same neurological manifestation. However, it could by easily diagnosed by different imaging modalities [10,13,12].

4. CONCLUSIONS

Due to its rarity, solitary cervical spine osteochondroma is usually diagnosed late, after the progression of the patient's neurological symptoms due to the gradual cord compression. However, in majority of the cases, the tumor is successfully treated by laminectomy with radical resection. The surgery usually has favorable outcomes. Complete surgical removal is necessary to prevent recurrence. Despite being rare, C1-C2 level osteochondromas should be always considered in the differential of any extradural cervical spine lesions, as it is the most common location for osteochondromas in the spine.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Author has declared that no competing interests exist.

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