Case Report

Foramen magnum osteochondroma causing myelopathy in a patient with hereditary multiple exostoses

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ABSTRACT

Background: Osteochondromas are commonly occurring benign bone tumors which may be either a solitary lesion or occur due to association with hereditary multiple exostoses (HMEs). There have been several reported cases of spinal osteochondromas, but intracranial lesions are rare.

Case Description: A 51-year-old male with a history of multiple osteochondromas presented with myelopathy. He had an exostosis arising from the foramen magnum causing compression of the cervical spinal cord that was successfully removed. Genetic testing revealed that he had HMEs.

Conclusion: Osteochondromas of the skull are extremely rare. However, parts of the foramen magnum ossify in cartilage and can give rise to an osteochondroma. Here, we present a patient with HMEs who developed cervical myelopathy due to an osteochondroma arising from the foramen magnum. Due to the cartilaginous ossification of the foramen magnum, clinicians should be aware that osteochondromas can occur in this location and potentially give rise to cervical myelopathy.

Keywords: Exostoses, Osteochondroma, Myelopathy

INTRODUCTION

Osteochondromas are benign bone tumors occurring in 3% of the general population; they account for 30% of all benign bone tumors.6 However, intracranial osteochondromas are rare (0.1–0.2% of all intracranial tumors).7 Of the 31 cases of intracranial osteochondromas reported in the literature, only 1 arose from the foramen magnum.1,2,4,5,7,9,11,12,14 Here, we present a patient with a foramen magnum/skull base osteochondroma causing spinal cord compression attributed to underlying hereditary multiple exostoses (HMEs).

CASE DESCRIPTION

A 51-year-old male presented with a 12-year history of difficulty climbing stairs, 12 months of clumsiness of both hands, and 9 months of shooting pain into the radial aspect of his left forearm, along with right-handed weakness/grip. He had historically had osteochondromas removed from his right iliac crest and left scapula, 12 and 11 years ago, respectively. He also gave a history of a bony growth on his forearm which had been previously removed.
Neurological examination

On examination, he was 5 foot 4 inches in height with bowing of both forearms and legs, and exaggerated curvature of the medial border of both feet. He exhibited a scissoring gait with spasticity (i.e., no motor deficit but hyperactivity of reflexes with bilateral Babinski responses) more right sided along with right medial thigh atrophy. The sensory examination was intact.

Diagnostic studies

Plain X-ray of the cervical spine [Figure 1] showed an exostosis at the posterior aspect of the craniovertebral junction; this finding was confirmed on CT scan [Figure 2]. The cervical MR showed severe cord compression from the posteriorly located exostosis, and there was a high signal in the cord on the T2-weighted image [Figure 3].

Surgery

The patient underwent removal of the C1 lamina en bloc laminectomy; it revealed a bony exostosis covered with a cartilaginous cap arising from the posterior lip of the foramen magnum that was drilled away achieving good decompression of the dura surrounding the spinal cord [Figure 3a and b]. Postoperatively, the patient had complete relief from his arm pain, and his spasticity also improved; he was discharged on the 5th postoperative day. Six months later, he continued to do well.

Histopathology

The histopathological report confirmed the diagnosis of osteochondroma [Figures 4]. The patient was subsequently sent for genetic analysis which confirmed he had hereditary multiple exostosis (i.e., also called diaphyseal aclasis).

DISCUSSION

Osteochondroma is the most common benign bone tumor. It is a cartilage-tipped exostosis and can be sessile or pedunculated with a cancellous structure that is well formed with a complete cortex. The stalk of an exostosis

Figure 1: (a) Lateral cervical spine X-ray shows an exostosis at the posterior part of the craniovertebral junction (white arrow). (b) Sagittal T2 WI MRI shows a bony spur from the lip of the foramen magnum (white arrow) pressing on the spinal cord and causing signal changes.

Figure 2: Axial CT scan shows the osteochondroma protruding into the cervical canal (white arrow), (a) axial view of foramen magnum, (b) axial view C1.
must be in direct continuity with the underlying cortex and medullary canal to be considered a true osteochondroma.\[^{10}\]

It can occur as a solitary lesion or as part of HME. Any bone which develops endochondral cartilage is susceptible to osteochondromas; they most commonly occur on the lateral side of active growth plates within long bones, but can also occur on the knee, scapulae, pelvis, tarsal, and carpal bones. In patients with HME, osteochondromas tend to be larger and highly irregular.\[^{3,10}\]

Intracranial osteochondromas are very rare, accounting for 0.1–0.2% of all intracranial tumors.\[^{7}\]

Lotfinia et al. (2012) reported a similar case in which a 73-year-old male presenting with quadriparesis and gait difficulties underwent complete and successful excision of an osteochondroma originating from the foramen magnum.\[^{9}\]

Hongo et al. (2015) and an additional seven cases (including our report) demonstrated that 43.3% of these lesion originating from the skull convexity, with the remainder originating from the falx cerebri (13.3%), parasellar (10%), posterior clinoid (10%), foramen magnum (6.7%), sella turcica (6.7%), middle fossa (3.3%), petrous bone (3.3%), and suprasellar (3.3%) regions.\[^{1,2,4,5,7,12,14}\]

Venkata et al. (2011) expressed that complete excision of an intracranial osteochondroma is curative.\[^{13}\]

**CONCLUSION**

Here, we report a foramen magnum osteochondroma in a patient with HME. Spinal surgeons should be aware that osteochondromas can arise from this location precipitating the onset of cervical myelopathy.

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**Declaration of patient consent**

Patient’s consent not required as patients identity is not disclosed or compromised.

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**Conflicts of interest**

There are no conflicts of interest.

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