Article published online: 2022-09-09

Case Report

Bilateral Cerebellopontine Angle Osteomas: Case Report and Review of the Literature

Abstract

Osteomas and exostoses of cerebellopontine angle (CPA) are very rare, benign, and usually slow-growing lesions; few case reports have been published about these lesions in literature. The most common localizations of these temporal bone lesions are the mastoid cortex and the external acoustic canal. To our knowledge, only two cases of bilateral osteoma arising from both internal acoustic canals (IACs) have been reported. However, these tumors are usually asymptomatic and diagnose incidentally, and they can cause symptoms related to the 7th and 8th cranial nerve involvement. We report on a 75-year-old woman affected with bilateral osteoma of CPA and review the literature that 27 cases of IAC osteoma and exostoses have been reported.

Keywords: *Cerebellopontine angle, exostosis, internal acoustic canal, osteoma*

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Introduction

Osteoma and exostoses are rare and benign lesions, which grows slowly.[1,2] Osteomas are mostly placed at facial bones, mandibular bones, and calvarial bones.[3] They also tend to be found in the mastoid cortex and external acoustic canal (EAC) of temporal bone; however, more rarely, they can be found in internal acoustic canal (IAC) and cerebellopontine angle (CPA).[1,3] Even though neuronal tissue involvement leads to neurologic problems, they are mostly diagnosed incidentally. To our knowledge, only one case has been reported with bilateral osteoma located in CPA and another case has been reported with bilateral osteoma, which lead to IAC obstruction.[2,4] We report on a case presented with headache and bilateral osteomas in CPA diagnosed incidentally and discuss the management of such cases.

Case Report

A 75-year-old woman, with a 1-year history of headache, was admitted to the Department of Neurosurgery, Kayseri Training and Research Hospital, in December 2012. Patient's headache had relieved partially under long-term medical treatment. Brain magnetic resonance imaging (MRI) was planned to identify the possible etiology of chronic headache. Brain MRI revealed bilateral extra-axial bony masses in IAC, which were placed at the superior edge at right and posterior edge at left. Lesions were hypointense in axial T2-weighted MRI. Cranial computed tomography images were obtained to identify osseous nature of lesions [Figure 1]. Even though there was no neurologic deficit, audiometry was done and no abnormality was found. The lesions were too small for operation, so we proposed conservative treatment instead of operation. Our diagnosis did not depend on histopathological findings. Control MRI was planned to follow-up possible progression. Unfortunately, the patient did not come back to our clinic, so we could not have follow-up data.

Discussion

Definition and pathology

Osteoma and exostoses located in IAC and CPA have been reported very rarely, and differential diagnosis should be done from each other.[1-21] Osteomas mostly arise from IAC and develop in CPA. They tend to be found in the mastoid cortex and EAC at temporal bone.[2,5] In addition, they were found in mastoid air cells and middle ear.[2]

Osteomas generally are isolated, pedunculated, dense, homogeneous bony development. They are well demarcated that can be circular or multilobular.[3] They

How to cite this article: Yilmaz BM, Egemen E, Tekiner A, Öcal Ö. Bilateral cerebellopontine angle osteomas: Case report and review of the literature. Asian J Neurosurg 2019;14:280-2.

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Access this article online

Website: www.asianjns.org

DOI: 10.4103/ajns.AJNS_330_17

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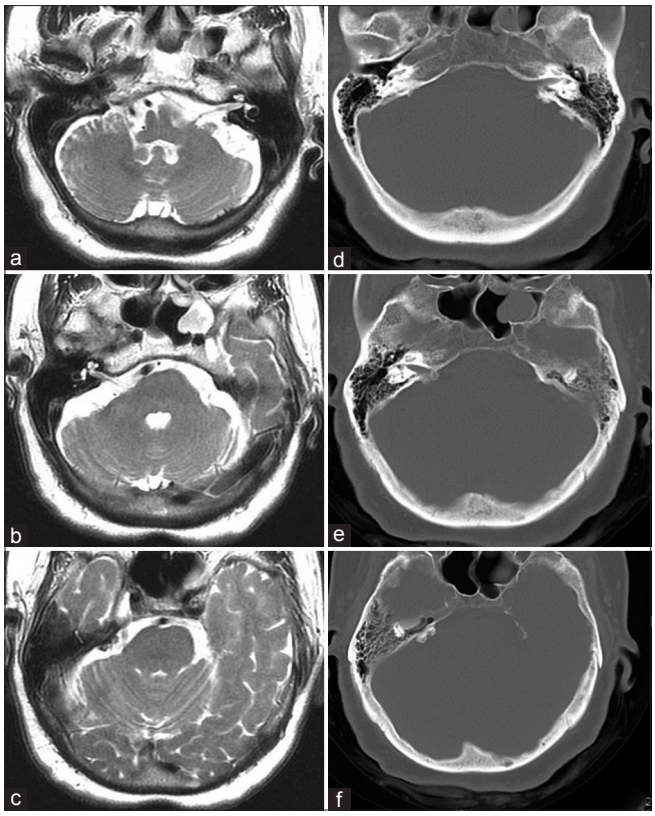

Figure 1: Initial presentation of the patient. Bilateral cerebellopontine angle masses were hypointense to cerebrospinal fluid in axial T2-weighted imaging (a-c), and hyperdense bony lesions were shown in cranial computed tomography scan (d-f)

usually involve tympanosquamous or tympanomastoid sutures.[2,3] Histopathologic examination shows irregularly oriented lamellate bones encircling highly fibrovascular channels. Reactive metaplastic ossification centers are present.[2,3] Contrary, exostoses usually tend to be multiple and bilaterally symmetrical. They involve tympanic bone and are histologically characterized by parallel layers of subepitelial bony layers.[2,5] Genetic defects, developmental diseases, inflammation, and bone injury may lead to both pathologies.[2,6]

Clinic presentation

Osteoma and exostoses of CPA are usually asymptomatic and diagnosed incidentally.[2,3,7,8] They are stable even for long time follows because of their slow-growing nature.[2] These tumors can cause symptoms related to brain stem compression and the 7th and 8th cranial nerve involvement, such as sensorineural hearing loss, tinnitus, vertigo, ataxia, and findings related to brain stem compression.[2]

Diagnostic imaging and evaluation

The differentiation of CPA osteoma from exostoses usually has been reported by CT and MRI examination.[2] Even though MRI and high-resolution CT scan could help to differentiate, histopathologic examination is gold standard for diagnosis.[1,2]

The differentiation of CPA osteomas and exostoses from other bony lesions involving IAC such as Paget's disease, fibrous dysplasia, and osteosclerosis must be considered.[3] Furthermore, CPA lesions should be reminded that might cause similar symptoms.

Management and prognosis

Few case reports have been published in literature, and besides, there are only two case reports of bilateral CPA osteoma. First, Gerganov *et al*. reported bilateral CPA osteoma that left-sided osteoma excised totally through retrosigmoid approach because the patient had symptoms related to vestibulocochlear nerve compression. The symptoms improved after surgery. Ciorba *et al*. reviewed 19 patients including literature and own patients. Thirteen patients had osteoma located in IAC, three had exostoses, and three had no information about pathology of lesions. Eleven patients had undergone surgery.[2]

To our knowledge, 27 cases have been reported with osteoma and exostoses located in CPA in respect of March 2013. These two lesions reviewed together because only 11 patients had undergone surgery, and eight patients had osteoma and three had exostoses. Furthermore, differential diagnosis is not always possible with radiologic imaging. Twenty-seven patients had been reviewed according to their radiological prediagnosis and histopathologic diagnosis if existed. Osteoma diagnosed in 20 patients and exostoses diagnosed in 6 patients. However, there was no information for one patient. Six patients were asymptomatic and followed by conservative treatment. Nineteen patients were symptomatic and 11 patients underwent surgery and 7 patients were treated by medical therapy.[2,9]

There is no particular indication universally shared on how to treat for osteoma and exostoses of CPA. Ciorba *et al*. advice to long-term follow-up with neurologic and audiovestibular examination and CT scan for asymptomatic patients.[2] Although successful surgical interventions such as middle fossa approach, retrosigmoid approach, or suprapetrosal approach have been described, symptoms might persist after surgery due to chronic compression.[3,10] Suprapetrosal approach allows drilling and exposure of IAC, but facial nerve in this exposure might be injured because of its superficial location.[3]

Conclusions

In patients presenting with atypical headache or lower cranial nerve deficits, CPA osteomas or exostoses should be considered in diagnostic workup. Further radiological investigations are helpful for correct diagnosis. Conservative treatment should be tried at first in asymptomatic patients. Surgery should be considered only in symptomatic and enlarging osteomas.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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