Rare disease

Bifid mandibular condyle: CT and MRI appearance

Onur Tutar,¹ Ahmet Bas,¹ Gökçe Gülsen,² Elmar Bayraktarov¹¹Department of Radiology, Istanbul University Cerrahpasa Medical Faculty, Istanbul, Turkey²Department of Radiology, Istanbul Haseki Training and Research Hospital, Istanbul, Turkey

Correspondence to Dr Ahmet Bas, dr.ahmetbas@hotmail.com

Summary

Bifid mandibular condyle (BMC) is a rare asymptomatic morphological alteration with no predilection for age group or gender. Its morphology varies from a shallow groove to two condylar heads with separate necks, oriented mediolaterally or anteroposteriorly. This report describes an unusual case of bilateral mediolateral bifid condyle in a 24-year-old female patient with the main complaint of mouth-opening limitation. MRI and CT findings revealed bilateral bifid condyle.

BACKGROUND

The widespread use of panoramic radiographs increased the number of bifid mandibular condyles (BMCs) diagnosed incidentally during routine dental examinations.¹ However, panoramic radiographs can hide bifidity by overlapping some anatomical structures. BMCs are now being more frequently discovered and described with the use of multiplanar imaging and reconstructing techniques. MRI and CT allow detailed visualisation of condylar morphology without osseous overlapping, leading to more accurate and specific diagnosis of some temporomandibular joint (TMJ) conditions.² CT may also be necessary to avoid mistaking it for a fracture or a tumour, especially in symptomatic cases.³ However, CT does not render a visualisation of the disc or other soft tissues and exposes the patient to various doses of radiation, in contrast to MRI. BMC is, thus, most likely to be an incidental finding during MRI of the head and neck.⁴

CASE PRESENTATION

A 24-year-old female patient was referred to a radiology department for a detailed investigation of her mouth-opening limitation cause. On clinical examination, the TMJ was asymptomatic; no pain, crepitation, clicking or muscle spasm was reported. However, the mouth-opening limitation was confirmed. The patient denied any history of trauma, fracture, bruxism or infection. The patient did not refer to any problem during her birth and did not report any

history of systemic disease or the use of any medication. A review of the family history failed to elucidate similar effect in other members of the family.

INVESTIGATIONS

MRI was performed to observe the TMJ conditions. The coronal view of MRI (figure 1A) revealed a BMC on the both sides and articulation with normal mandibular fossas. The sagittal view of MRI in the closed (figures 2A and 3A) and open (figures 2B and 3B) mouth position through groove of a BMC revealed normal position of a clearly depicted articular disc and normal movement of the condyle and articular disc on both sides.

CT was also performed in order to better evaluate the morphology of the TMJ and to eliminate any pathology such as fractures that might be missed. The CT appearance of the high-resolution sections indicated bifid formation of both mandibular condyles (figure 1B). The joint head orientation was in the mediolateral direction (figure 4).

DISCUSSION

According to Blackwood,⁵ articulating surfaces of the BMC are divided by a groove and can be oriented mediolaterally or anteroposteriorly. The mediolateral orientation is presumed to result from a developmental cause; however, a sagittal split with anteroposterior orientation is associated with a previous, identifiable, traumatic event. The aetiology of the BMC can be explained, according to

Figure 1 Coronal T1-weighted magnetic resonance image (A) and coronal reformatted CT image (B) showing bilateral bifid condylar head in the mediolateral position. Note erosion at the groove of the right bifid mandibular condyle.

Figure 2 Sagittal oblique gradient-echo T2-weighted closed-mouth position (A) and open-mouth position (B) MR image of the left TMJ showing normal position of a clearly depicted articular disc (arrow) and normal movement of the condyle and articular disc.

Figure 3 Sagittal oblique gradient-echo T2-weighted closed-mouth position (A) and open-mouth position (B) MR image of the right TMJ showing normal movement of the condyle and articular disc (arrow). Also note the flattened anterior band of the articular disc.

Blackwood's theory, by well-vascularised fibrous septa that appear in the condylar cartilage at approximately 20 weeks of intrauterine life and extend to the cavity of the developing ascending ramus.⁵ Szentpétery *et al*⁶ suggested that when two condylar parts lie in the sagittal

plane, the cause could be traumatic; when the condylar parts lie in the coronal plane, the cause could be persistence of the fibrous septa. The hypothesis of a developmental origin of mediolaterally oriented heads is also supported by Shriki *et al*.⁷

Figure 4 Three-dimensional CT image of the skull showing bifid mandibular condyle on the left (A) and right (B) side.

Most reported cases with traumatic origin had a different degree of limitation in mandibular movement, whereas non-traumatic cases were mostly asymptomatic and detected by chance or by retrospective assessment of radiological examination.¹ In non-traumatic cases, moderate pain with joint clicking has been reported.⁸

Learning points

- ▶ Most cases of bifid mandibular condyle (BMC) are asymptomatic, but there can be associated symptoms such as clicking, moderate pain and limitation of mandibular movements.
- ▶ BMC was classified as anteroposterior and mediolateral.
- ▶ The mediolateral orientation is presumed to result from a developmental cause.
- ▶ The anteroposterior orientation is associated with a previous, identifiable, traumatic event.

Competing interests None.

Patient consent Obtained.

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