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Case report

Bifid mandibular condyle: a case report

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Abstract: The bifid mandibular condyle is a rare anomaly. A variety of causes are implicated with its development such as developmental origin and trauma. Because of the lack of epidemiological data, there is little information about the real incidence of this malformation. The purpose of this paper is to report a case of bifid mandibular condyle in a 20-year-old woman who referred to a private radiological clinic for routine dental examination. A panoramic radiography incidentally revealed a discrete modification of the left mandibular condyle. Magnetic resonance imaging (MRI) was taken and confirmed the diagnostic proposed. (J. Oral Sci. 48, 35-37, 2006)

Keywords: mandibular condyle; panoramic radiography; nuclear magnetic resonance.

Introduction

Bifid mandibular condyle is an uncommon anomaly. In 1941, Hrdlicka was the first to describe such a condition, reporting 21 cases (18 unilateral and 3 bilateral) in a series of skull specimens from The Smithsonian Institute (1-7). The first report of this condition in a living individual was in 1948 by Schier. Subsequently, further cases of bifid condyle, either unilateral (1-3,5,8-11) or bilateral (4,6), were reported.

This condition is usually asymptomatic, and is thus most likely to be an incidental finding during radiographic examination or magnetic resonance imaging (MRI) of the head and neck (5,6). However, some cases are found in patients with temporomandibular joint (TMJ) clicking (5), ankylosis (1) and trauma (12). The morphology of the bifidity ranges from grooving to discrete and complete lobulation of the condyle. Interestingly, a patient with trifid mandibular condyle has also been described in the literature (7). Here, we describe the radiographic features of a case of bifid mandibular condyle.

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Case

A 20-year-old woman was referred to a private radiological clinical service in Fortaleza City, CE, Brazil for routine dental examination. A panoramic radiograph revealed a discrete modification of the left mandibular condyle head (Fig. 1). The TMJs of the patient were imaged using a specific TMJ mode to better evaluate the form of the condyles (Fig. 2). MRI was performed in order to observe the condyles in a sagittal and coronal plane (Figs. 3 and 4) and it was possible to observe that the left condyle had a real duplication with mediolaterally situated

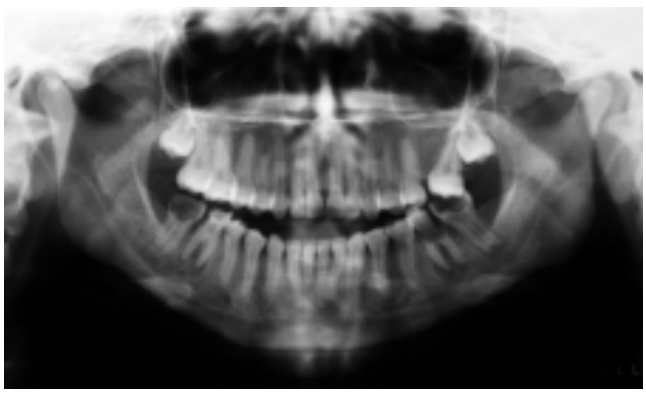

Fig. 1 Panoramic radiographic image revealing discrete modification of the left mandibular condyle head.

heads.

No facial asymmetry was evident on clinical examination. The patient exhibited a maximum jaw opening of 50 mm, right and left lateral opening of 8 and 10 mm, respectively, and protrusion of 3 mm. There was no history of trauma or fracture of the mandible, and the patient did not report pain or trismus.

Discussion

Condylar duplication is a rare anomaly whose etiology remains unclear (13). A genetic origin has been suggested (9), although minor trauma or developmental factors, either in uterus or during childhood, are a more likely cause (4). Poswillo (14) studied the effects of condilectomy in monkeys and reported that some alterations in the position of fibroblastic cells surrounding the disc surface could influence the remodeling bone, causing the development of bifid condyle. A trauma etiology is supported by results of previous studies (1,14,15). Stadnicki (1) reported bifid mandibular condyle in a 3-year-old girl who complained of limited mouth opening and consequently developed temporomandibular ankylosis. The girl had no history of surgery but her mother reported that forceps were used in the delivery of the child. Thomason and Yusuf (14) described two cases of bifid condyle after fracture and subsequent condylar remodeling. Sales et al. (15) reported a case of a patient who developed bifid condyle 4 years after condylar fracture. In our case, the patient denied mandibular fracture or any previous trauma during all her life.

Blackwood (16) suggested that bifid condyle present a developmental origin and results from retention of connective tissue septa. These septa are normally present in the condylar cartilage at around 20 weeks of fetal development, but Blackwood suggested that septa remaining after the second year of life could cause impaired ossification and consequently development of bifid condyle.

Gundlach et al. (9) induced bifidity by injecting teratogenic substances such as *N*-methyl-*N*-nitrosourea and formhydroxamic acid into pregnant rats. Another probability is the combination of these teratogenic substances and muscle attachments. Because these muscles fibers were identified as originating in the fetus whose mother was given the teratogenic substances Form-hydroxamic acid and *N*-methyl-*N*-nitrosourea. The modification in the direction of muscle fibers leads to the

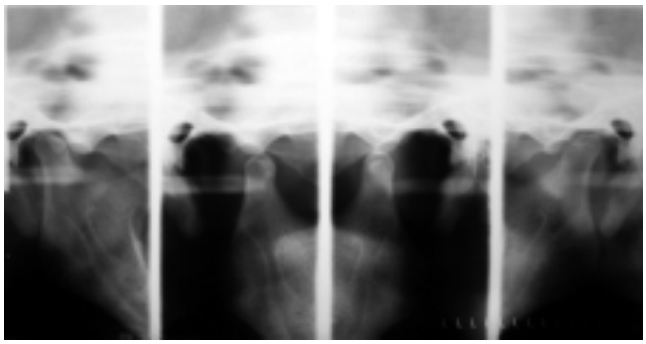

Fig. 2 An open-closed projection of TMJs showing discrete grooving in the left mandibular condyle and a bilateral normo-excursion movement.

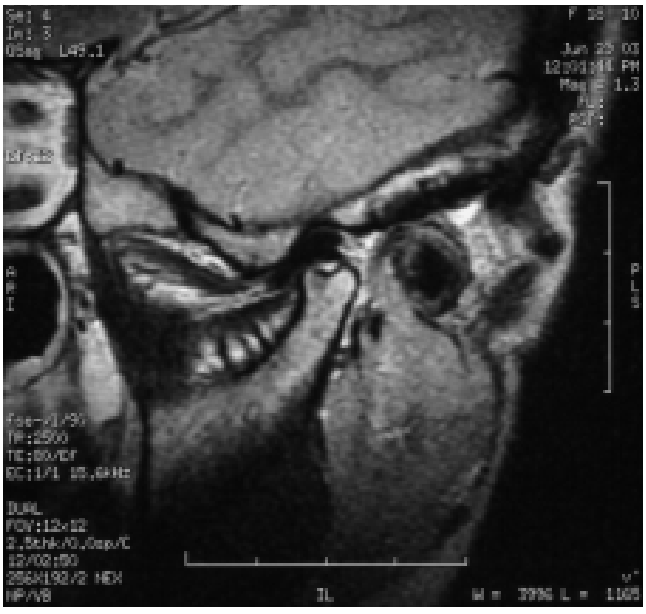

Fig. 3 MRI examination in the sagittal (TR-550 and TE-15) plane revealing left bifid condyle heads.

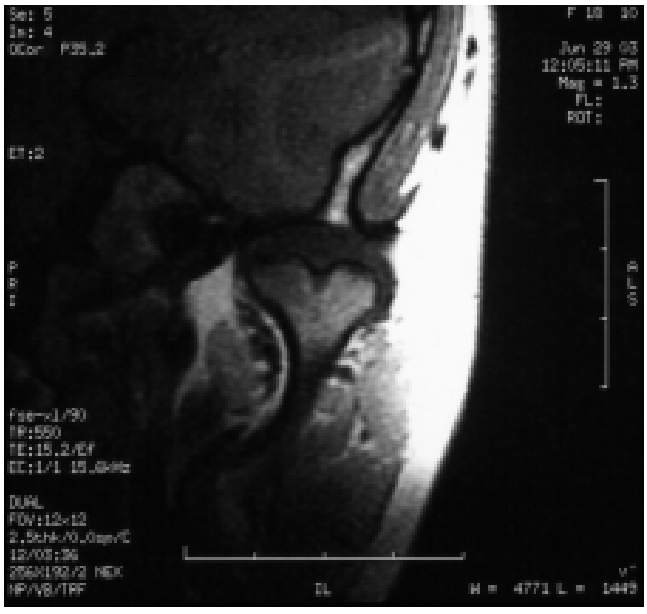

Fig. 4 MRI examination in the coronal (TR-550 and TE-16) plane showing head duplication in a mediolateral direction.

formation of a bony spike in the area where it inserts. These authors suggested that double-headed mandibular condyles are a type of embryopathy. Quayle and Adams (17) have proposed that endocrine disorders, nutritional deficiency, infection, trauma, irradiation, and genetic factors could result in bifidity.

Szentpétery et al. (13) studied 1882 prehistoric and historic skulls. Out of 2077 condyles examined, 7 cases showed signs of bifidity, and the findings suggested that the abnormal orientation of the condyle head was the most likely cause. In cases where the orientation is antero-posterior, early childhood mandibular fractures are implicated, whereas in those cases with mediolaterally oriented heads, the persistence of the septa is suggested as the possible cause (10). In the present case, the mediolateral orientation of the condylar head suggests bifidity of developmental origin, as a result of persistence of the septa (13).

In the most cases (4-6,10), patients have no symptoms and the majority of cases are detected during radiographic routine examination. However, bifid mandibular condyle has been reported to be associated with symptoms such as pain, swelling, limited oral opening and, most commonly, TMJ clicking (18). In our case, due to the lack of clinical symptoms, diagnosis was based on radiological findings.

Panoramic radiography is routinely performed as part of dental examination. However, overlapping of some anatomical structures on the radiograph can hide bifidity. Computed tomography allows detailed evaluation of condylar morphology without osseous superpositioning (15). In the present case, MRI revealed the duplicity, showing mediolaterally situated heads without disc displacement.

In summary, bifid mandibular condyle is a rare anomaly whose etiology remains unknown. Most patients are asymptomatic and multiple radiographic projections using different techniques are necessary for diagnosis. In the present case, diagnosis was established and confirmed using MRI.

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