



# Bilateral bifid condyle mandibula features in panoramic radiograph: A case report

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## ABSTRACT

**Objectives:** The aim of this case report is to describe radiographically the specific features of bifid mandibular condyle that frequently found incidentally on panoramic radiographs.

**Case Report:** A 24-year-old man came to the Installation of Dental Radiology RSGM UNPAD brought a referral letter for a panoramic radiograph. From anamnesis is known patient have complaints of pain in the jaw joints left and right at the time of open mouth. Panoramic radiographs show mesioangular dental impaction of 48, and edentulous tooth 36 and presence of bifid condyle on the right and left condyle. Bifid condyle usually becomes incidental finding on routine panoramic

radiographic examination. Bifid condyle features can be shown by depression or notch on the superior surface of condyle. Bifid condyle can provide a "heart-shaped" from the frontal view. For a definite feature can be seen with other modality such as CBCT. Sometimes there is also a change in the mandibular fossa to compensate the morphological changes of the condyle.

**Conclusion:** Bifid condyle mandible is a variation in the shape of the condyle whose cause is not known with certainty. The bifid condyle gives the "heart-like" appearance that is often found on accidental panoramic radiographs. Generally, cases of BMC do not require treatment unless they cause symptoms.

**Keywords:** Bifid condyle, heart-shaped condyle, panoramic radiograph

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## INTRODUCTION

Bifid mandibular condyle is rare anomaly that was first reported in 1941 by Hrdlicka.<sup>1,2,3</sup> Based on some literature and previous research, the incidence of BMC ranges from 0.31-1.82%. This case can appear unilaterally or bilaterally without any differences in sex or racial preferences.<sup>3,4,5,6</sup>

Bifid Mandibular Condyle (BMC), also known as a double-headed condyle is a condition of bone disorder in which the articular surface of the condyle is divided into two parts; anterioposterior and mediolateral.<sup>8</sup> The condylar division ranges from a superficial groove to two different condyles with separate necks. The condylar division ranges from a superficial groove to two different condyles with separate necks.<sup>4,8</sup> Although it is still uncertain, several sources state that the cause of BMC can be triggered by trauma to the mandible, developmental anomalies, teratogenic drug use, genetic tendency, surgery (condylectomy), infection and radiation exposure. Nonetheless, several cases associated with ankylosis and the temporomandibular joint have been reported.<sup>6,8,9,10,11</sup>

In most cases, BMC is asymptomatic and is more often found incidentally on radiographic examinations in the form of panoramic, CT, MRI, ultrasonography, and CBCT.<sup>3,6</sup> With the increasing

use of radiography, especially in dentistry, the findings for this case are also increasing. Therefore, clinicians need to radiographically recognize the bifid mandibular condyle to determine the diagnosis and appropriate treatment plan for the patient.<sup>11,12</sup> This article reports on a symptomatic case of bifid condylar discovered during a routine radiographic examination. In this article, we will describe the clinical features on panoramic radiograph and accompanying clinical symptoms in bifid condyles cases.

## CASE REPORT

A 24-year-old man came to the Installation of Dental Radiology RSGM UNPAD brought a referral letter for a panoramic radiograph. From anamnesis is known, patient have complaints of pain in the jaw joints left and right at the time of open mouth. Panoramic radiographs show a mesioangular dental impaction of 48, and edentulous tooth 36. Panoramic also shows the position of the right and left condyles in the glenoid fossa and symmetrical, but an image of the right and left condyles has anomaly in form (Figure 1). The right and left

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condyle show features a depression or notch on superior condylar surface, and the condyle shown double head condyle (Figure 2).

## DISCUSSION

BMC (Bifid Mandibular Condyle) is one of the most common forms of a bony condition called Multi Headed Condyles (MHC).<sup>10</sup> This case was first described by Hrdlicka in 1941 who identified 21 BMC from skull specimens at an institution in Washington.<sup>1,2,3,10</sup> The first reported case in a living person was reported by Scihir in 1948.<sup>10</sup>

BMC is often discovered by incidental finding during radiographic examination.<sup>2,3,6,13</sup> Most of the patients do not complain of any symptoms, so it is difficult to find these cases without the aid of radiographs. Several cases were found incidentally through routine panoramic radiograph examinations.<sup>3,8,11</sup> The incidence of BMC has increased in the last 10 years due to the increasing use of radiology in patient care procedures.<sup>10</sup>

BMC is a rare anatomical disorder and until now the etiology cannot be known with certainty. There

are two theories that can explain the process of BMC. First, BMC is the result of a cartilaginous dysplastic process in the condyles at an early stage of development such as embryopathy by teratogenic agents. Second, BMC can be caused by articular trauma that causes bone remodeling or repeated microtrauma from malocclusion in patients. The first theory regarding dysplasia is supported by the possibility of BMC occurring without any prior trauma in the patient's medical history. However, a history of trauma in patients with BMC has been suspected of being the cause of BMC as much as 25%.<sup>9</sup> However, in general, several factors have been suspected of contributing to the occurrence of BMC, such as developmental anomalies, trauma to the condyle, perinatal trauma, teratogenic embryopathy, and condylectomy.<sup>9,10,14</sup>

Bifid mandibular condyle (BMC) is described as a condition of the mandibular articular condyle bone presenting a vertical cleft in the middle of the head with variable depth and separating it into two parts.<sup>8,10,15</sup> The vertical depression/notch/cleft eventually gives the appearance of a "double" or "heart-like" condylar head anteroposteriorly or mediolaterally.<sup>8,15,16,17</sup> In panoramic radiograph,



Figure 1. Panoramic radiograph of patient with bifid mandibular condyle

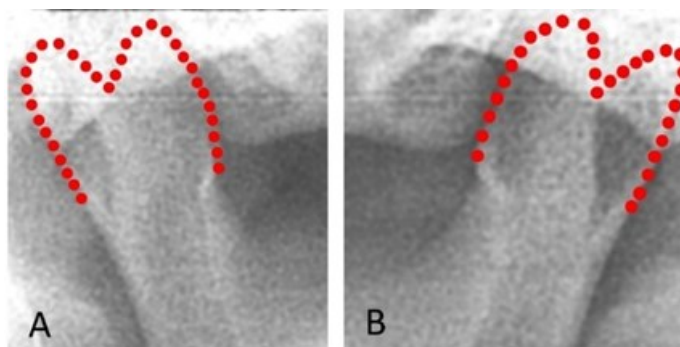


Figure 2. Cropped images of the head of (A) right condyle, and (B) left condyle

bifid mandibular condyle showing features lobulated condyle. It can be unilateral or bilateral and the orientation can be in mediolateral or anteroposterior plane.<sup>13,18</sup> It has no predilection for age, sex, or race.<sup>6</sup> The left side has been seen to be more commonly involved than the right side. The bifidism can be either mediolateral or anteroposterior.<sup>13</sup> In this case, there are notch formed in the condyle on the right and left sides that is visible in panoramic radiograph.

Although many literatures state that BMC is an asymptomatic, it has been reported that patients with BMC experience difficulty in occlusion and mastication.<sup>5,9</sup> Changes that occur in the head of the condyle cause deformity in the articular fossa fossa. This causes disruption of the function of speech, mastication and limited mouth opening.<sup>8</sup> Several studies have shown that BMC is asymptomatic, but if conditions accompanied by other abnormalities such as ankylosis of the TMJ can cause joint sounds, pain, and restriction of mouth opening.<sup>8</sup> If this occurs, consideration should be given to the need for surgical intervention to restore TMJ function.<sup>9</sup> BMC induced by trauma can also cause clinical symptoms such as persistent pain, facial asymmetry and limited mandibular movement.<sup>3,6</sup>

In this case report, patient have complaints of pain in the jaw joints right and left at the time of open mouth. Panoramic radiograph shown missing teeth first left molar, an impacted teeth third right molar horizontally. And from temporomandibular joint area, showing an anomaly form of right and left condyle mandibula. From the radiograph seen bifid mandibular condyle right and left. The panoramic views often demonstrated the two mandibular heads with either anteroposterior orientation, as in the case of traumatically induced bifid mandibular condyle, or mediolateral in the setting of a presumed developmental abnormality.<sup>17</sup> Panoramic features of bifid mandibular condyle showing a "heart-shaped" from the frontal view, head of condyle shown a depression or notch on superior condylar surface or duplication of condyle.<sup>4,14</sup> It is not explained significantly how deep the sulcus is suspected of being a bifid condyle and distinguishes it from cases of normal variation. The differential diagnosis includes a vertical fracture of the condylar head.<sup>16</sup>

Some studies suggested that BMC may have occurred as a result of changes in the position or form of the disc. The changes was leading to the formation of intraarticular septa across the joint space.<sup>10,13</sup> This, in turn, may have influenced the pattern of condylar regeneration. In the present patient, a history of joint trauma seemed improbable although there had been a nonbony, facial injury as an infant. This may have an effect on the condylar germinative mesenchymal cell lining.<sup>4,7</sup>

Treatment of BMC usually depends on the presenting complaints of the patient. There is no treatment indicated unless pain or functional impairment is present.<sup>16</sup> However, symptoms are not observed in the affected condyle in about 67% of patients with BMC.<sup>15</sup> In BMC patients who have

symptoms, regular follow-up should be carried out to improve the patient's quality of life. Treatments that can be given are NSAID drugs, analgesics, physical therapy, and occlusal plates. Surgery is only recommended to restore function in bifid condyles that have ankylosis or that do not respond to conservative treatment. However, the correct diagnosis must be made before determining the appropriate treatment.<sup>18</sup>

## CONCLUSION

Bifid condyle mandible is a variation in the shape of the condyle whose cause is not known with certainty. The bifid condyle gives the "heart-like" appearance that is often found on accidental panoramic radiographs. Generally, cases of BMC do not require treatment unless they cause symptoms. However, knowledge of symptoms and clinical features on radiography must be possessed by clinicians in order to determine the treatment.

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## FOOTNOTES

All authors have no potential conflict of interest to declare for this article. Informed consent was obtained from the patient for being included in this case report.

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