Bifid Mandibular Condyle: Report Of Three Cases

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ABSTRACT

Bifid condyle is a rare entity characterized by the duplicity of the head of the mandibular condyle. The etiology of this condition still remains unclear with an implication of numerous factors. Most of the cases are asymptomatic and diagnosed as an incidental finding in radiographic images. Here we report three cases of bifid mandibular condyle with different presentations. One is a unique case of symptomatic unilateral bifid mandibular condyle in a 44-year-old female patient. The other one is an incidental finding from radiograph and the third case of bifid condyle is associated with TMJ ankylosis following the trauma.
INTRODUCTION:
Bifid condyle is a rare anomaly characterised by the duplicity of the head of the mandibular condyle. It was first described by Hrdlicka in 1941. He reported 21 cases of this anomaly from human skull specimens.\(^1\) Most of the cases presents unilaterally with no significant age and sex predilection. The etiology of bifid mandibular condyle remains unclear, but variable factors have been implicated such as developmental anomalies, trauma, infection, irradiation, teratogenic embryopathy and surgical condylectomy.\(^2\) It is usually asymptomatic and diagnosed as an incidental finding in radiographic images. Here we report three cases of bifid mandibular condyle with different presentations.

CASE 1:
A 44-year-old female patient reported to the department of Oral Medicine and Radiology with a chief complaint of pain in the right temporomandibular joint since 6 months. She also complained of associated difficulty with mouth opening. Then a clinical examination was performed using diagnostic criteria for Temporomandibular disorder. The patient had no significant medical and family history. She also denied of any TMJ trauma. There was an insidious onset of joint pain 6 months back which was of sharp and intermittent in nature and aggravated with mastication and jaw movements. There was no history of joint sounds or intermittent joint locks. The patient had a symmetrical face and proportional facial characteristics. Limited mouth opening was observed with a maximum interincisal opening of 20mm. lateral jaw movements were not restricted. No clicking sounds were detected on manipulation of TMJ. The muscles of mastication were not tender on palpation. The patient had a complete set of permanent dentition with a missing right mandibular third molar and there was no occlusal derangement. Based on clinical examination patient was subjected to radiographic evaluation. Panoramic radiograph was taken to assess the integrity of temporomandibular joint (TMJ). It revealed an abnormal right condylar head morphology. Further imaging with CBCT scan was performed with the consent of patient. CBCT images indicated bifid formation of right mandibular condyle, which was a depression on the superior condylar surface. The head of the condyle was oriented in medio-lateral direction. TMJ space, glenoid fossa and articular eminence were normal.

![Figure 1A: Abnormal right condylar head morphology on Panoramic radiograph](image_url)
CASE 2:
A 53-year-old female patient reported to the department of oral medicine and radiology with the complaint of pain in the left temporomandibular joint since 1 year. There was an insidious onset of joint pain 1 year back which was of sharp and intermittent in nature and aggravated with mastication and jaw movements. She denied of any TMJ trauma. The patient had a symmetrical face and proportional facial characteristics. Mouth opening was adequate with a maximum interincisal opening of 35 mm. Lateral jaw movements were not restricted. Clicking sounds were detected on manipulation of left TMJ. The muscles of mastication were not tender on palpation. Right TMJ appears to be completely asymptomatic. The patient had a complete set of permanent dentition with a missing right maxillary second and third molar. Panoramic radiograph revealed degenerative changes of left TMJ with flattening of condylar surface and altered morphology of right condyle indicating of bifid formation. Informed consent was taken from the patient prior to CBCT scan. Cone beam computed tomographic images confirmed the presence of bifidity of right condyle and the degenerative-osseous changes of left TMJ. The orientation of the condylar head was medio-lateral.
Figure 1B: Panoramic radiograph showing altered morphology of right condyle with bifid formation and degenerative osseous changes of left condyle.

Figure 2B: Bifidism of right condyle on coronal section.

Figure 3B: Bifidism of right condyle on axial section.
CASE 3:
A 15-year-old male patient reported to the department of oral medicine and radiology with the complaint of difficulty in mouth opening noticed since 6 months. He had a history of trauma to left TMJ one year back. Extra-oral examination revealed facial asymmetry, with roundness and fullness of left side of the face and flattening and elongation of right side, with deviation of the mandible towards the left side on mouth opening. Movement of the left temporomandibular joint (TMJ) not palpable via the external auditory canal. Mouth opening was limited with a maximal interincisal opening less than 20mm. Informed consent was taken from the parents and CBCT scan was performed with minimum possible Field of Volume. CBCT images showed obliteration of left TMJ space with bony deposition and the bifid formation of left condyle in mediolateral direction. The normal relationship of condylar head to glenoid fossa was found in right TMJ.

![Figure 1C: Bifidity of left condyle in association with ankylosis.](image)

DISCUSSION
The Bifid Mandibular Condyle (BMC) is also known as double headed condyle. It is a rare entity with an unclear etiopathology. The first description of BMC was given by Hrdlicka in 1941. He identified a total of 21 cases from human skull specimens in which 18 were unilateral and 3 were bilateral. In 1948, Schier reported the first case of BMC in a living individual. According to Katti, a total of 130 cases have been reported in living people, till 2010. Within the last two decades reports on BMC have been increased mainly owing to the advent of new diagnostic imaging techniques like cone beam computed tomography which enables three dimensional visualisation of osseous structures without superimposition of adjacent structures.

BMC is described as the duplicity of the head of the mandibular condyle. The condylar splitting ranges from a shallow groove to two distinct condyles with a separate neck. The condyles can be oriented medio-laterally or antero-posteriorly. BMC’s can either be unilateral or bilateral. Unilateral BMCs have been reported about four times as compared to bilateral ones. Review of literature shows no significant age and gender predilection. Most of the conditions are asymptomatic and diagnosed as an incidental finding on radiographic images. The first case reported here is symptomatic and associated with joint pain and limited mouth opening. The second case is an incidental finding of bifid condyle from radiograph with the degenerative osseous changes of contralateral side. The third case represents bifidity of condyle in association with ankylosis following the trauma.

Several theories have been put forward by various authors to describe the etiopathology of this condition. It may be developmental or acquired, commonly after a trauma to the temporomandibular joint (TMJ). Earlier theory of Hrdlicka have suggested that obstruction in blood supply of the condyle during
its development might be a cause for the duplication of condyle. In 1957, Blackwood gave an developmental origin for BMC. The persistence of connective tissue septa in the condylar cartilage after two years of life will cause impaired ossification resulting in BMC. Poswillo in 1972 suggested that surgical condylectomy might be a cause for the development of BMC. He explained it on the basis that alteration in the position of fibroblast cells around the disc surface will affect the bone remodelling. According to Quayle and Adams endocrine disorders, nutritional deficiency, infection, trauma, irradiation, genetic factors could also result in double headed condyle. Gundlach et al. in 1987 proved that bifid condyles are a type of teratogenic embryopathy. They have induced bifidity by injecting teratogenic substances such as N-methyl-N-Nitrosurea and formhydroxanic acid into pregnant rats. Szentpetery et al. in 1990 suggested that the orientation of condylar heads are related to the etiology of the condition. It is said that anteroposterior bifidism is related to trauma that of mediolateral to other developmental disorders. The first two cases suggest the developmental origin of bifid condyle with the orientation of heads in mediolateral direction. The third one is believed to be a post traumatic case of bifid mandibular condyle. The trauma during puberty or childhood could result in a bifid condyle, as well as ankylosis because the mandibular condyle is an important centre of facial growth. But here the orientation of condylar heads are seen in mediolateral direction instead of anteroposterior bifidism. It was opposite to the theory of Szentpetery et al., which made us to conclude that the direction and presence of BMC can be governed by multiple factors.

Cases without the history of trauma are considered as non-traumatic origin. Most of the non-traumatic cases are asymptomatic and they are diagnosed as an incidental finding from radiographs. In the first case, the patient had not reported any previous history of trauma to TMJ, so it can be considered as a unique case of BMC which is symptomatic and of non-traumatic origin. Most of the non-traumatic cases have condyles oriented mediolaterally. It is true with this case also. Literature have revealed BMC cases of non-traumatic origin in association with TMD symptoms. Agarwal et al. have reported a case of BMC with rheumatoid arthritis and joint pain. An non-traumatic case associated with internal derangement of disc have been presented by Alpaslan et al. TMJ clicking is more commonly observed in these cases. In this case joint pain and limited mouth opening are marked symptoms. Surgical treatment in indicated in BMC cases associated with TMJ ankylosis. It can be treated surgically, through procedures such as gap arthroplasty, interpositional arthroplasty, condylectomy, and joint reconstruction.

CONCLUSION
Bifid Mandibular Condyle is a rare entity with an unclear etiology. Non traumatic BMC’s are usually asymptomatic, but can present with TMD symptoms on rare occasions. A rise in incidence of BMC in the current scenario can be attributed to an increased awareness of the condition and to the advent of novel diagnostics imaging modalities. At the same time, further studies are needed to ascertain the etiology of bifidity of mandibular condyle.

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REFERENCES
3. Kaur B, Padda S. The prevalence, radiographic appearance and gender predilection of bifid mandibular condyles in Punjabi population of