

Prevalence of Bifid Mandibular Condyle ; A Retrospective Orthopantomogram Study in Southern Rajasthan

Abstract:

Condylar duplication is a very rare and interesting anomaly of unknown etiology. Bifid mandibular condyle (BMC) are usually diagnosed on routine radiographic examination. Various causes for this condition have been discussed in the literature, but there is still no agreement as to the exact cause and the real prevalence.

Aim : To assess the prevalence of (BMC) in population of Southern Rajasthan.

Methodology and Results: A retrospective analysis of 13565 OPGs were done and a total of 4 fulfilled the diagnostic criteria of BMC, Thereby, reporting a prevalence of 0.051 % in Southern Rajasthan.

Conclusion: The Dental professionals should have some knowledge of this anatomic abnormality, as well as its implications for function and appropriate treatment modalities, so that they can be alert to this potential diagnosis.

Key-words: Bifid mandibular condyle, Orthopantomogram

Introduction:

The term 'bifid' is derived from the Latin word 'bifidus' which means cleft into two separate parts duplication of the mandibular condylar head in man is exceedingly rare.[1] Bilateral Bifid mandibular condyle (BMC) is a rare anomaly, described as “the duplicity of the head of the mandibular condyle.”[2] It was first described in 1941 by Hrdlicka, in a study on dried skulls in which 18 unilateral and three bilateral cases were reported.[3] Shaber reported the first case of bilateral BMC in a living person.[4] According to Blackwood, 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.[5]

Although the exact etiology of BMCs is not yet fully understood, trauma and developmental factors have been considered to be the two major possible etiologies. Vascular,

nutritional, endocrinal, teratogenic, or infectious causes of this malformation have also been proposed.[6,7]

BMC is radiographically characterized as a double condyle head; for this reason it is widely known as 'double-headed

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condyle'.¹ The widespread use of panoramic radiographs increased the number of (BMCs) diagnosed incidentally during routine dental examinations.[8] Its incidence has been reported to be from 0.018% to 1.82%.[9] Excluding known traumatic causes, the incidence and clinical significance of BMC regarded as having a developmental origin should be investigated. Hence, this study was performed to assess the prevalence of BMCs using Orthopantomogram views (OPGs) in Southern Rajasthan population.

Materials and methodology:

A retrospective radiographic study was done for a period of 1 year (2022–2023) in the Department of Oral medicine and Radiology at R.R Dental college and Hospital, Udaipur after obtaining ethical clearance. In this study after obtaining consent from the patients, a retrospective evaluation of a large patient population data consisting of 13565 (OPGs) had been performed and archived on the same radiological device (Papaya Genoray) operated at 15 mA, peak voltage ranging from 70-80 Kvp.

All OPGs views were screened and evaluated by the corresponding author to estimate the incidence of MRC. The clinical and radiological character in the diagnosis of the disease had been as follows:

The OPGs that did not fulfill the diagnostic criteria or with the ghost images had been excluded.

The ethical clearance for the conduct of this research was obtained and no conflicts of interest had been reported in our study.

Results:

Amongst the 13565 screened OPG views of patients, a total of 4 fulfilled the diagnostic criteria of BMC thereby, reporting a prevalence of 0.051% in Southern Rajasthan [Figures 1].

Patients were aged 15–55 years (mean, 32.6 years), with the majority aged 15-42 years. On screening, ratio of MRC affecting the male and female gender group was observed to be (3:1). OPG radiographic views were sufficient to verify the diagnosis of BMC without the requirement of 3 dimensional staging.

Discussion:

Bifid mandibular condyle is an uncommon entity with a controversial etiology. It is reported that BMC has no predilection by sex or ethnic background or the age.[10] It is usually discovered as an incidental finding on panoramic

radiographs. BMC is radiographically characterized as a double condyle head; for this reason it is widely known as 'double-headed condyle' The anomaly may occur on both sides but is usually more frequently unilateral, apparently without any marked predilection for any one side. Bifid condyle is usually asymptomatic.[11] According to McCormick, a bifid condyle can be assumed when the condyle appears duplicated or lobulated.[12]

Several epidemiological studies have been carried out on living subjects. Menezes et al¹³ found only nine (0.018%) cases of BMC from 50,080 panoramic radiographs in a Brazilian population. However, Miloglu et al¹⁴ and Sahman et al¹ examined panoramic radiographs in Turkish subjects and reported the prevalence of BMC as 0.31% and 0.52%, respectively. The prevalence of BMCs in our study 0.051 % % was less than that reported by other authors.

Unilateral BMCs have been found about four times as often as the bilateral form. In the literature, the majority of studies have reported that BMCs involve the left side more often than the right side, while Miloglu et al¹⁴ presented a predilection for the right side whereas in present study bilateral involvement was more common [Figures 1].



Figure 1 Orthopantomogram showing Bilateral bifid condyle showing anterior protuberance with plateaued anterosuperior surface.

The real prevalence of BMC is not known exactly.[11] As the use of dental panoramic radiographs becomes widespread, and especially with the development of rotational OPG, the number of reported cases has increased in recent years. [11] Some authors have documented cases with additional tests such as CT scan, MRI.[13,15] It is an unexpected finding in routine checkups such as the OPG, which is the most common way it is diagnosed. although the usefulness of conducting such tests is questionable, since they involve a financial and time commitment on the part of the patient whose prognosis is not going to change. (Moreover, in the case of the CT, the

patient receives radiation). However, the diagnostic orientation and therapeutic treatment in patients who show symptoms or who have abnormal function may justify performing such tests. Since, it was a retrospective study hence, usage of 3D imaging was not necessary as it is suggested that further tests, such as MRI or CT, be carried out only in cases where the therapeutic approach involves an active treatment.[16]

Conclusion :

The real prevalence of BMC is not known exactly. As the use of dental panoramic radiographs becomes widespread, and especially with the development of rotational panoramic radiography, the number of reported cases has increased in recent years. The Dental professionals should have some knowledge of this anatomic abnormality, as well as its implications for function and appropriate treatment modalities, so that they can be alert to this potential diagnosis.

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