International Journal of Current Advanced Research
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: 6.614
Available Online at www.journalijcar.org
Volume 11; Issue 07 (B); July 2022; Page No.1224-1225
DOI: http://dx.doi.org/10.24327/ijcar.2022.1225.0272

Research Article

MANDIBULAR NERVE ANOMALIES: A REVIEW

Tamoghna Jana, Vijay Ebenezer and Balakrishnan R

Department of Oral and Maxillofacial Surgery Sree Balaji Dental College and Hospital Pallikaranai, Chennai- 100, Tamilnadu, India

A R T I C L E I N F O

Article History:

Received 06th April, 2022
Received in revised form 14th May, 2022
Accepted 23rd June, 2022
Published online 28th July, 2022

Keywords:

Mandibular Nerve Anomaly, Bifid Mandibular Canal, Coronoid Foramen

A B S T R A C T

The mandibular nerve is one of the 3 branches of the Trigeminal Nerve. It has both sensory and motor strands. It rises from the foramen ovale and gives rise to the buccal and lingual nerves and slips down further to give rise to the nerve to the mylohyoid and the inferior alveolar nerve. This can be the ordinary anatomical course of the mandibular nerve, but there are different peculiarities and contrasts within the course of the nerve, to be specific, bifid canals, presence of coronoid foramen, irregular number of mental foramina, etc. These peculiarities cause different iatrogenic complications amid surgical strategies. Hence, we should in this article dig into a few of the common inconsistencies of mandibular nerves This survey article aims to alleviate the different morphological inconsistencies of the mandibular canal through reviewing already published literature.

INTRODUCTION

The mandibular nerve is one of the 3 branches of the Trigeminal Nerve. It has both sensory and motor strands. It emerges from the foramen ovale and gives rise to the buccal and lingual nerves and descends further to give rise to the nerve to the mylohyoid and the inferior alveolar nerve. This can be the ordinary anatomical course of the mandibular nerve, but there are different peculiarities and contrasts within the course of the nerve, specifically, bifid canals, nearness of coronoid foramen, unusual number of mental foramina, etc. These peculiarities cause different iatrogenic complications amid surgical methods. In this way, we should in this article dive into a few of the common inconsistencies of mandibular nerves.

DISCUSSION

Bifid Mandibular Canal- Peerapong Wamasing, Chutamas Deepho, Hiroshi Watanabe *et al* did a study in 2015-16, in Tokyo dental and medical university, utilizing MRI to analyze the morphology of the mandibular canals of patients to look for inconsistencies. They utilized high resolution MRI with 3-dimensional volumetric interpolated breath-hold examination sequence (3D-VIBE) procedure through the neurovascular bundle (NVB) [4]. The left and right parts of the mandible were considered as individual case. 59 cases were excluded due to non-suitable neurovascular bundle anatomy and artifacts. At last, 249 cases of hemi-mandibles were obtained and after that classified as: (i) type 0, which implied no evidence of bifid mandibular canal (BMC), (ii) type 1, meaning one NVB and two NVBs on route to it, (iii) type 2, meaning two NVBs. CT scans and X-Ray panoramic views were also taken to observe whether each BMC can be observed in them. Of the 249 cases, 6.4% were found to have BMC (counting both type 1 and 2). The subtype division are as follows: type = 93.6%, type 1 = 4.4%, type 2 = 2.0%. of all the cases as it were 1 might be recognized utilizing only CT scans Nutrient canals (NC) were also recognized utilizing the MRI scans. Hence, the incidence rate of BMC was determined to be 6.4% which of NC was 58.4-97.6%, counting retromolar canal [4]. In this way, this study concluded that in spite of the fact that the total incidence rate of BMC is 6.4%, however dental practitioners ought to stay vigilant sufficient to recognize that BMCs do happen and are generally the causes of teeth not getting anesthetized indeed in spite of the fact that adequate local anesthetic has been stored repeatedly.[4]

Ozlem Okumus, Asım Dumlu, in 2017, conducted a study among the Turkish populace in order to determine the frequency of Bifid Mandibular Canal (BMC). For the study 500 patients were chosen, with equal number of male and female candidates. The mean age of the patients was 38.24 years with a range of 14-79 years. Cases where pathologies were influencing the mandibular canal, were avoided. CB-CT checks were taken for all the patients. The varieties were assessed with coronal, sagittal, panoramic and cross-sectional reconstructed CB-CT images for all the hemi-mandibles. The BMCs were at that point further classified according to the criteria given by Naitoh *et al*. they were classified into 4 categories: (i) retromolar, (ii) dental, (iii) forward, (iv) buccolingual, using CB-CT.[3]

Corresponding author:* **Tamoghna Jana
Department of Oral and Maxillofacial Surgery Sree Balaji Dental College and Hospital Pallikaranai, Chennai- 100, Tamilnadu, India

1. Forward Canal, is where the branch is emerging from the upper border of the main canal. It is of two types- (a) without confluence, it separates from the mandibular canal in the ramus and extends to the second molar area, (b) with confluence, where it separates from the mandibular canal in the ramus, extends anteriorly and then rejoins to the main canal.
2. Buccolingual canal, the branch emerging from the buccal or lingual side of the main canal
3. Dental canal, the end of the separated canal reaches the root apex of the first, second and third molar
4. Retromolar canal, the branch emerging from the main canal reaches the retromolar region.

BMCs were observed in 248 out of 1000 sides (24.8%) and in 200 out of 500 patients (40%), which were isolated among 106 females (53%) and 94 guys (47%). Hence, the females showed a somewhat higher rate of BMC. The forward canal was the foremost common, taken after by the retromolar canal, at that point the buccolingual canal and the dental canal [3]. The study concluded that the rate of BMCs is impressively high in case of Turkish population, in this way, Dental Specialists ought to be greatly cautious whereas treating patients, particularly amid extraction of lower molars, as a BMC incredibly increments the chance of the tooth being included with the nerve canal. Various other analysts have over the years conducted studies over different distinctive populaces to find out the incidence of BMCs, Table 1 shows the particular information.

Table 1 The findings of bifid mandibular canal prevalence in other studies.[3]

Author	Population	Method	Prevalence
Naitoh *et al*	Japan	CBCT	64.8%
Kuribayashi *et al*	Japan	CBCT	15.6%
Orhan *et al*	Turkish	CBCT	66.5%
Fue *et al*	Taiwanese	CT	30.64%
Kang *et al*	Korean	CBCT	10.2%
Rashsuren *et al*	Korean	CBCT	22.6%
Shen *et al*	Taiwanese	CT, CBCT	30%, 41.2%
Villac¸a *et al*	Brazilian	CBCT	26.67%
Yang *et al*	Chinese	CBCT	31.1%

In 2017, Dr Nyer Firdoose Chintamani Subhan, did a study utilizing panoramic radiographs, CBCT and MRI, on a 43-year-old patient. Uncovered a bizarre and impossible to miss finding within the coronoid process and the ramus of mandible as identified by the author. An unusual radiolucency on the coronoid forms bilaterally together with a bizarre radiolucency on the ramus of the mandible which did not co-relate with the typical radiolucency of the lingual fossae. Subsequently empowering, the need for further assessment of mandible and the coronoid forms. He at that point utilized 3d CBCT cuts to decide the presence of anatomical anomaly. Scan affirmed the structural change such as presence of huge foramina/bony defects within the respective coronoid forms of the jaw beside the bilateral accessory foramen on the lateral aspect of the ramus.MRI looks show the two mandibular canals on right side showed up to be isolated as it were to consolidate at the level of the mandibular foramen. In any case, the mandibular canals on the left side were confluent with the mandibular and the sidelong extra foramina. The axial and sagittal section images also affirmed the presence of the varieties.[1]

In 2021 S. Y. A. Al-Siweedi, *et al* [6], did a study on 202 patients from Malaysian populace, utilizing 202 CBCT scans. They recorded whenever trifid mandibular canal (TMC) was found. After doing a detailed study, the length of TMC was measured either within the sagittal or panoramic reconstructed CBCT images using the SimPlantTM computer program because it permits one to measure straight or curved structures. The length of the adornment canals was measured from the beginning point of division of the main canal to an end point that dwells within the mandible or at its ending at a foramen. They moreover measured the breadth and shape of the cross section of the canals, and found out 10 self-evident categories out of the 12 types of TMCs recorded. All TMCs (but one) were seen in older than 30 years. The ethnic predominance is 6 in Malays, 5 in Chinese and 1 in Indian. Four (33.3%) patients had bilateral TMCs, which was missing within the Indian subject. 56.3% of the accessory canals were seen to be found over the main Mandibular Canal. Their mean breadth was 1.32mm and 1.26mm for the primary and second accessory canal, and the corresponding lengths were 20.42mm and 21.60mm, respectively. 62.5% of the cases had irregularly molded lumen and there were more unpredictably molded canals within the second accessory canal than the first branch. None of the second accessory canal was oval.

CONCLUSION

Thus, we can conclude that the anatomical anomalies differ in form and numbers in different populations. More number of studies need to be done to confirm this as a regular phenomenon. And dentists as a whole should remain vigilant in cases where the inferior alveolar nerve seems to not be anesthetized easily.

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