

A CASE REPORT WITH ABSENCE OF MENTAL FORAMEN ON THE LEFT SIDE MANDIBLE

DR.D.KRUPA DANIEL, DR.CHITHAMBARAM CHANDRASEKARAN, DR.AJITH MANO, DR.NAGAVENI, DR.NAVEEN BHARATHI, DR.SUNDARJI, DR.VALARMATHI.

Abstract : Mandible is the largest, strongest bone in the face. It forms the lower jaw and holds the mandibular teeth or lower teeth in place. It consists of an oval or round foramen called as mental foramen through which mental vessels and mental nerves passes through. The osteogenic study on mandible was carried out with n=205 dry mandibles in observing the mental foramen on the right side with oval shaped as 59.5% and on left side mental foramen oval shaped with 72.3%. On the right side mental foramen rounded shape with 40.5% and on left side mental foramen rounded shape with 27.2% and peculiarly with 0.5% identified as absence of mental foramen on the left side.

Keywords : Mandible, Mandibular foramen, Mental Foramen, Inferior alveolar Nerve, Mental nerve.

Introduction : Mandible is the largest, strongest bone in the face. It forms the lower jaw and holds the mandibular teeth or lower teeth in place. The body of the mandible has outer surface and inner surface. In the midline of the mandible a faint ridge is present as an indication of the mandibular symphysis where the bone is formed by the fusion of left and right mandibular processes. It consists of curved horizontal portion, the body and two perpendicular portions called the rami which unite in the midline as symphysis menti. The external surface in the midline is marked by symphysis menti and divides below and encloses a triangular eminence called as mental protuberance. The base of the mental protuberance is depressed in the center and raised on either side to form mental tubercle. A foramen is present on the anterolateral aspect of the body of the mandible lateral to the mental tubercle named as mental foramen through which mental vessels and mental nerve passes through. The ramus of mandible is quadrilateral in shape and has two surfaces, four borders and two processes. Especially the medial surface presence an oblique foramen called as mandibular foramen for the passage of inferior alveolar vessels and nerve. Then the mandibular foramen leads into mandibular canal which runs obliquely downwards and forwards in the substance of ramus of mandible and later it runs forwards horizontally where it is placed under the alveoli of mandible. On reaching at the level of

incisor teeth it gives off small canal like cavity called as mental foramen. As the inferior alveolar vessels will pass and exit through mental foramen as mental vessels and mental nerve. The mandible also comprises of a mandibular notch, condyloid process and coronoid process. In the adult the mental foramen opens midway between upper border and lower border of the mandible. The mandibular canal runs in parallel with the mylohyoid line. In the old age the bone becomes greatly reduced in size with the loss of the teeth and consequently the main part of the bone with mandibular canal and with mental foramen appears close to the alveolar border.

Aim and Objectives : To study the dry mandibles and identify the various shapes of mental foramen and identify the presence or absence of mental foramen.

Materials and Methods : Dry mandible, Vernier caliper, Inch scale, Nylon thread, Stainless steel wire, Surgical hand gloves and other stationeries.

Observations :

Shape of mental foramen	Right	Left
Oval	122	148
Round	83	56
Presence or Absence of MF	0	1
Total	205	205

Oval shaped Mental Foramen



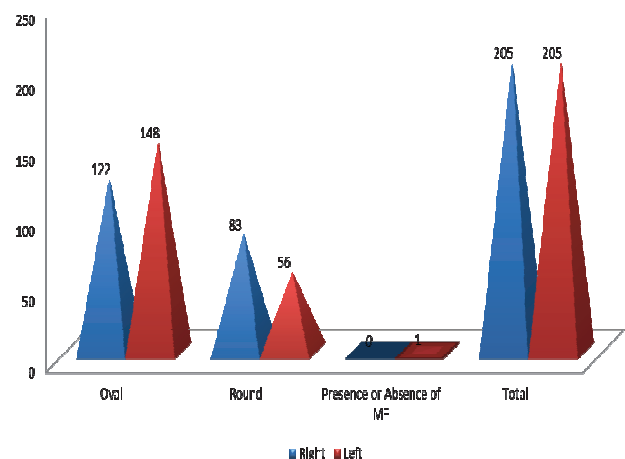
Round Shaped Mental Foramen



Right unilateral Mental Foramen



Mental Foramen



Discussion : The morphology of mandible and its mental foramen varies according to the age, gender and race with different regions. According to medical literature the morphometric characteristics of the mental foramen are variable with different races tends to be located on the mandible between the second pre-molar and first molar in Tanzanians. In Mongolians it was observed to be located in line with second pre-molar teeth. In Caucasian, Israelis and Jordanians the mental foramen is located between first and the second pre-molar teeth. In Byzantiums the most common position of mental foramen was present between first and second pre-molars on the right side where as it is present in line with second pre-molar teeth on the left side. In Japanese it is located below the

second pre-molar teeth on the right side and for the left side it is present between the first and the second pre-molar teeth. In Malawians the mental foramen was seen postero-superiorly in line with pre-molar teeth. In Zimbabweans it was present posteriorly in line with second pre-molar teeth on the right side and between second pre-molar and first molar on left side corresponding the alveolar ridge. The location of mental foramen also changes with age. In children it is located closer to the alveolar margin before eruption of the teeth. During and after the eruption of the teeth the mental foramen descends between upper margin and lower margin. In old age due to the loss of teeth and bone resorption the mental foramen moves upwards closer to the alveolar border. In extreme

resorption the mandibular canal opens at the alveolar margin and the mental nerve emerges closer to the alveolar border and the nerve will be directly found under the gums. In our study on the right side mental foramen oval shaped with 59.5% and on left side mental foramen oval shaped with 72.3%. On the right side mental foramen rounded shape with 40.5% and on left side mental foramen rounded shape with 27.2% and peculiarly with 0.5% identified as absence of mental foramen on the left side. Generally the mandibular nerve passes through mandibular foramen as inferior alveolar nerve and courses through mandibular canal and exits as mental nerve through mental foramen and supplies to the skin of the chin, mucous membrane of lower lip, buccal gingivae, mandibular teeth and pre-molar teeth and communicates with marginal mandibular branch of facial nerve and sensory branch of mylo-hyoid nerve. Due to the absence of mental foramen on the left side the inferior process in the foraminal area needed to verify the position of the mental foramen and validating the presence of anterior loop of the mental nerve. The mental nerve can be blocked with local anesthesia, a procedure used in the surgery of the chin, lower lip and buccal mucosa from midline to the second pre-molar teeth – commonly used during dental treatment. It is important to consider the position of mental foramen and its morphological variations for the effectiveness of anesthesia during facio-maxillary surgery. It can be concluded that variations in

alveolar nerve is as usually coursing through mandibular canal and continues as anterior loop of mental nerve were categorized as straight, perpendicular or looping pattern. Anterior loop of mental nerve exits in different locations such as superiorly, postero-superiorly, posteriorly, mesially and labially. Mainly it courses labially and skin of the chin gets nerve supply by sensory branch of mylo-hyoid nerve and mucous membrane of lower lip, buccal gingivae gets nerve supply by inferior labial nerve and the anterior loop of mental nerve exits between the pre-molars and also in extreme degree of resorption the mental nerve were found directly under the gums.

Conclusion : The mental foramen is an important landmark for viewing pre-operative radiological examination in order to avoid nerve damage during surgical process. During absence of mental foramen in order to avoid nerve injury during surgical number of mental foramen is rare if any surgery is planned in the area of canine to first molar teeth. One should always keep in mind these variations in order to avoid neuro-vascular bundles. The mental foramen is an important anatomic landmark in odonto-stomatology and orthognathic surgeries. The reason for the absence of mental foramen may range from atrophy, post traumatic fibrosis, osteoblastic hyperplasia, bone resorption and congenital agenesis.

References :

1. Detection of anterior loop and other patterns of entry of mental nerve into the mental foramen: A radiographic study in panoramic images - Asha Raghunandan Iyengar, Seema Patil, Kikkeri Seetharamiah Nageshi, Sushma Mehkri, Aastha Manchanda, Year : 2013 | Volume : 3 | Issue : 1 | Page : 21-25
2. Unilateral variation of the mental foramen. M Verma, S Soni, A Saxena*, AR Das - Verma M, Soni S, Saxena A, Das AR. OA Case Reports 2013 Sep 10;2(11):102.
3. Characteristics Of The Mental Foramen In Different Populations - T Hasan - The Internet Journal of Biological Anthropology, Volume 4, Number 2.
4. Bilateral absence of mental foramen in a living human subject -Surgical and Radiologic Anatomy 07/2014; 37(4). DOI: 10.1007/s00276-014-1347-x.
5. Mental Nerve - <http://www.intelligentdental.com/2011/12/28/mental-nerve/>
6. Mental foramen - http://en.wikipedia.org/wiki/Mental_foramen/
7. The mental foramen and nerve: clinical and anatomical factors related to dental implant placement: a literature review - Greenstein G1, Tarnow D.- Periodontol. 2006 Dec;77(12):1933-43.

8. The Mandible (Lower Jaw) - Henry Gray (1821-1865). *Anatomy of the Human Body*. 1918.
9. The Mental Foramen and Nerve: Clinical and Anatomical Factors Related to Dental Implant Placement: A Literature Review Gary Greenstein*† and Dennis Tarnow†doi: 10.1902/jop.2006.060197
10. Anatomical Variation of Mental Foramen - A case report Anwar Ramadhan, Elias Messo, Jan-Michaél Hirsch - *Stomatologija, Baltic Dental and maxillofacial Journal*, 12: 93-6, 2010
11. Anatomy of Mandibular Vital Structures. Part II: Mandibular Incisive Canal, Mental Foramen and Associated Neurovascular Bundles in Relation with Dental Implantology - Gintaras Juodzbalyš, Hom-Lay Wang², Gintautas Sabalyš - *J Oral Maxillofac Res* 2010 (Jan-Mar) | vol. 1 | No 1 | e3 | p.1
12. Guidelines for the Identification of the Mandibular Vital Structures: Practical Clinical Applications of Anatomy and Radiological Examination Methods - Gintaras Juodzbalyš, Hom-Lay Wang² - *J Oral Maxillofac Res* 2010 (Apr-Jun) | vol. 1 | No 2 | e1 | p.1
13. The location of the mental foramen in a selected Malay population - Wei Cheong Ngeow and Yusof Yuzawati - *Journal of Oral Science*, Vol. 45, No. 3, 171-175, 2003
14. Oliveria Junior, E.M., Araujo, A.L.D., Da Silva, C.M.F., Sousa Rodrigues, C.F. & Lima, F.J.C. Morphological and Morphometric Study of the Mental Foramen on the M-CP-18 Jiachenjiang point.
15. Sicher, H. & Tandler, J. *Anatomical para dentistas*. Barcelona, Editorial Labor, 1930.
16. Nevin, M. & Puterbaugh, P.G. *Conduction, infiltration and general anaesthesia in dentistry*. 4th ed, Brooklyn, N.Y./ London, Dental items of inter. Publish/Kimpton, 1942.
17. Wang, T.M., Shih, C., Liu, J.C. & Kuo, K. A clinical and anatomical study of the location of the mental foramen in adult Chinese mandibles. *Acta Anat.(Basel)*. 126(1):29-33, 1986.
18. Marzola, C. *Anesthesiologia*, Sao Paulo, Pancast Editorial, 1989.
19. Phillips, J.L., Weller, R.N., & Kulild, J.C. The mental foramen: 2. Radiographic position in relation to the mandibular second premolar. *J. Endod.*, 18(6):271-4, 1992.
20. Pessa JE, Slice DE, Hanz KR, Broadbent TH Jr, Rohrich RJ. Aging and the shape of the mandible.
21. Oguz, O. & Bozkir, M.G. Evaluation of the location of the mandibular and mental foramina in dry, young, adult human male, dentulous mandibles. *West Indian Med. J.*, 51(1):14-6, 2002.
22. Souaga, K., Adou, A. & Angoh, Y. Topographical and morphological study of the mandibular foramen in black Africans from the Ivory Coast. *Odontostomatol. Trop.*, 27(105):17-21, 2004.

Dr.D.KRUPA DANIEL,

Associate Professor of Anatomy, Southern Medical University,
Guangzhou P.R, China, Email : danielkrupa1309@gmail.com.

Dr. Ajith Mano - 2nd Year MBBS, Southern Medical University, Guangzhou P.R, China.

Dr. Naveen Bharathi - 2nd Year MBBS, Southern Medical University, Guangzhou P.R, China.

Dr. Valarmathi - 2nd Year MBBS, Southern Medical University, Guangzhou P.R, China.

Dr. Nagaveni - 2nd Year MBBS, Southern Medical University, Guangzhou P.R, China.

Dr. Sundarji - 2nd Year MBBS, Southern Medical University, Guangzhou P.R, China.

Dr. Chithambaram Chandrasekaran, 4th Year MBBS, Southern Medical University, Guangzhou P.R, China.