

A Study on the incidence of Retromolar Foramen and Canal in Indian Dried Human Mandibles and its Clinical Significance

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Abstract: The retromolar foramen (RMF) is one of the nonmetrical variants of the mandible (Ossenberg, 1987). The dental practitioners should be aware of this variant and the possible complications which may occur during anesthetic, surgical, and implantation procedures of the mandible. Indian adult dried human mandibles (150) were observed for the presence of retromolar foramen (RMF) or retromolar canal. Their gross morphological features were studied. These canals showed variations in location, length and diameter in relation to third molar.

Many people require removal of their third molar also known as wisdom teeth. As with any surgical procedure, there are some possible risks and complications (Anderson, 1998). The lower third molar region includes the area in which this tooth, its supporting elements and the adjacent soft parts, the lingual nerve and the elements of the paralingual space. Posterior to lower third molar there is a cribose triangular surface, the retromolar triangle and the retromolar fossa laterally (Suazo *et al.*, 2007). The cribose area of the retromolar triangle communicates with the mandibular canal, describing it via an anesthetic technique for the inferior alveolar nerve block (Suazo *et al.*, 2008, Sandoval *et al.*, 2008). Clinically, this region is covered by an elevation of mucosa of variable size.

Retromolar fossa is a depression where the buccinator muscle is attached above the inferior alveolar canal. From a clinical point of view this area forms, an open corridor for the passage of infections arising in connection with the third molar, this is the so-called Chompret-L' Hirondel abscess (abcès migrateur de Chompret-L'Hirondel) used its path (Libersa *et al.*, 1982; Peron, 2004). On the surface of the retromolar fossa found the retromolar foramen (RMF), which creates a canal of variable depth, regarded as an anatomical variation. Since most of the anatomical books do not mention about this foramen or canal this study was undertaken to analyze the incidence in Indian adult dried mandibles.

Materials and Methods

A total of 150 Indian adult dried human mandibles were observed for the presence of retromolar foramen (RMF) or retromolar canal in Department of Anatomy, Sri Ramachandra Medical College and Research Institute. Their locations in relation to third molar were taken into account for observation. The diameter and

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the depth were measured by using Mitutoyo's Dial Caliper.

Observations

The retromolar foramen and canal Fig. 1 was found in 26 of 150 mandibles (17.3%) of which 8 on the right side (5.3%), 6 on the left side (4%) and 12 bilaterally (8%) (Table I). The depth of the retromolar foramen and canal was found to be an average of 12mm Fig.2a and 2b. The diameter of the retromolar foramen and canal was found to be an average of 1.3 mm. The distance between posterior third molar to retromolar foramen and canal was found to be an average of 4.5 mm on the right side and 4mm on the left side Fig.3. The distance between anterior border of ramus to retromolar foramen was found to be an average of 8.4 mm on the right side and 8.3mm on the left side. The distance

between lingula to retromolar foramen was found to be an average of 14.1mm on the right side and 12.6mm on the left side.

Table 1 Distribution of Retro Molar Foramen

Sex	Right side	Left side	Bi-lateral	Total	%
Male	3	2	5	10	6.6
Female	5	4	7	16	10.6

From the above observations the occurrence of RMF was more in females compared to males. The diameter of RMF was found to be larger in the right side. The distance of RMF from third molar, anterior border of ramus and lingula are also found to be higher on the right side. The bilateral occurrence of RMF was found to be higher in females.

Fig. 1 Photograph showing retromolar foramen on both sides.

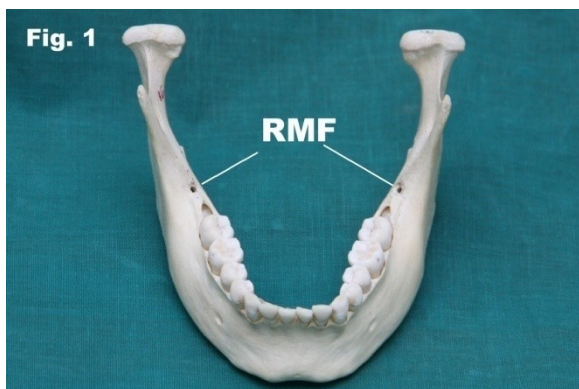


Fig. 2a Photograph showing the depth of retromolar foramen on the right side.



Fig. 2b Photograph showing the measurement of the depth of retromolar canal.

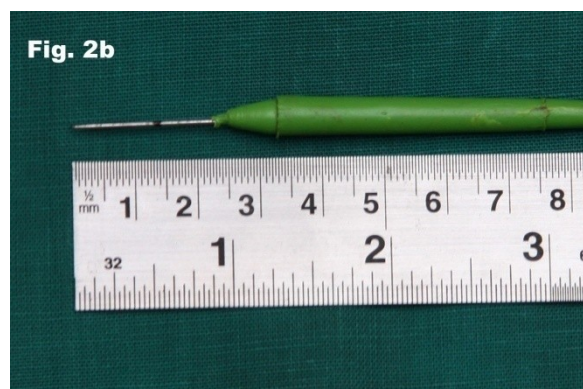


Fig. 3 Photograph showing retromolar foramen on the left side.



Discussion

The incidence of RMF located in the retromolar fossa, in our study was 17.3%. It is higher than what reported earlier by Suazo, *et al.*, (2008) 12.9% in Brazilians, but lower than what reported by Kodera & Hashimoto, (1995) 19.5% in Japanese population and Narayana *et al.*, (2002) 21.9% in the South Indian population.

Kodera and Hashimoto (1995) performed the dissection of retromolar canal in Japanese cadavers and found within the retromolar canal, the artery running was a branch from the inferior alveolar artery, it ran through the canal forwards and joined with the branches of the buccal artery and the facial artery. The nerve in the retromolar canal was a branch from the trunk of inferior alveolar nerve and branched off to the following areas: the third mandibular molar, the mucosa of retromolar triangle, the buccal mucosa, and the buccal gingiva of the mandibular premolar and molar region. These elements may be injured in the dieresis procedures, flap lifting, bone tissue for autologous bonegrafts, osteotomy for the surgical extraction of lower third molars, placement of osseointegrated implants for orthodontic or during the division of the mandibular ramus in the sagittal split osteotomy surgery (Reyneke *et al.*, 2002, Boronat Lopez and Peñarrocha Diago, 2006).

This study clearly establishes the incidence of the retromolar foramen and its clinical significance. The retromolar foramen is highly variable in their morphology and morphometry. The cortical plate over the retromolar triangle is not heavy as the bone surrounding it and it is more cancellous (Ash *et al.*, 2003). During routine anesthetic, surgical and implantation procedures of the mandible, care should be taken not to damage the neurovascular bundle passing through the retromolar foramen.

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