



A STUDY OF RETROMOLAR FORAMEN IN DRY ADULT HUMAN MANDIBLES

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ABSTRACT

Retromolar foramen is found in the triangular area behind the lower third molar tooth and it allows the passage of neurovascular bundle that contribute to the nutrition and innervations of the pulp and periodontium of the lower teeth. In the present study, the retromolar foramen and canal was found in 9 of 109 dried adult human mandibles (9.81%). Out of which 5 retromolar foramen (5.45%) were unilateral and 4 retromolar foramen (4.36%) were bilateral. Out of 5 unilateral retromolar foramen, 3 (3.27%) were seen on the right side and 2 were seen on the left side of the mandible. The diameter of the retromolar foramen and canal was found to be an average of 1.2mm. The distance between the posterior third molar tooth to retromolar foramen and canal was found to be an average of 4.4 mm on the right side and 4 mm on the left side of the mandible. Knowing the morphology of the human mandible and its possible variations is important for the planning of several procedures in the dental area as orthognathic surgery, mandibular reconstruction, extraction of third molars and installation of dental implants.

Key words: Accessory foramen of mandible, Third molar tooth extraction, Retromolar foramen, Retromolar canal.

INTRODUCTION

Morphology of human mandible and its variations are very important for planning of various surgeries like mandibular reconstruction, extraction of third molar tooth also known as wisdom tooth and for installation of dental implants [1]. Mandible is pierced by a number of accessory foramina, most of them are unnamed and infrequent in occurrence, but one such accessory foramen which occurs frequently is the retromolar foramen [2]. The retromolar foramen is a rare anatomical structure [3]. Retromolar foramen is usually found in retromolar area [4,5]. Retromolar area is in the form of a triangular depression, which can be seen between the temporal crest medially and the anterior border of ramus of mandible laterally. This is called as a retromolar fossa. When retromolar foramen is present, it is connected with the mandibular canal and is believed to transmit a neurovascular bundle consisting of an artery, vein and a nerve.

Knowledge of the presence of this neurovascular bundle is very important for surgical procedures like impacted third molar tooth extraction [6-8] and this neurovascular bundle may be injured in the flap lifting procedures, bone tissue for autologous bone grafts, 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.

MATERIALS AND METHODS

One hundred and nine dried adult human mandibles irrespective of sex were observed for the presence of the retromolar foramen. These bones were obtained from the collection in the Department of Anatomy, Vijayanagar Institute of Medical Sciences, Ballari, Karnataka, India.

The diameter of the retromolar foramen and the distance from the posterior border of the socket for the third molar tooth was measured.

RESULTS

The retromolar foramen and canal was found in 9 of 109 dried adult human mandibles (9.81%). Out of which 5 retromolar foramen (5.45%) were unilateral and 4

retromolar foramen (4.36%) was bilateral. Out of 5 unilateral retromolar foramen, 3 (3.27%) were seen on the right side and 2 were seen on the left side of the mandible. The diameter of the retromolar foramen and canal was found to be an average of 1.2mm. The distance between the posterior third molar tooth to retromolar foramen and canal was found to be an average of 4.4 mm on the right side and 4 mm on the left side of the mandible.

Figure 1. Showing 109 dry adult human mandibles.



Figure 2. Showing unilateral retromolar foramen.



Figure 3. Showing bilateral retromolar foramen.



DISCUSSION

Ossenberg examined mandibles of several world locations, including: Italy, while from 86 mandibles evaluated achieved an 8.1% incidence of retromolar foramen; in the Japan evaluated 94 mandibles achieved an incidence of 3.2%; to analyze the mandibles of 485 Eskimos had 8.2% incidence of this foramen; 11 mandibles evaluated of Canadians of European descent with an incidence of 9.1%.

Kaufman et al affirmed that the presence of the neurovascular bundle present in the retromolar foramen and canal causes concern in clinical dentistry as during surgery for extractions of third molars or sagittal osteotomies of the mandible [10].

Kodera and Hashimoto 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.

Pinsolle et al suggested that because the retromolar canal also allow the passage of vascular components, may facilitate the spread of infection and metastases from the oropharynx [11,12].

Perin et al reported that the lesion of the vascular component of the retromolar canal during surgery for insertion of implants can produce bleeding, difficulting the incision and increasing the potential for formation of fibrous tissue in the area of contact with implant. Singh during surgery of a third molar, injured a nerve that

crossed an unusual foramen located in the retromolar fossa. After the surgery, it was found that the patient presented paresthesia of the buccal mucosa from the retromolar region until the canine to the operated side [13].

In the present study, the retromolar foramen and canal was found in 9 of 109 dried adult human mandibles (9.81%). Out of which 5 retromolar foramen (5.45%) were unilateral and 4 retromolar foramen (4.36%) were bilateral. Out of 5 unilateral retromolar foramen, 3 (3.27%) were seen on the right side and 2 were seen on the left side of the mandible. The diameter of the retromolar foramen and canal was found to be an average of 1.2mm. The distance

between the posterior third molar tooth to retromolar foramen and canal was found to be an average of 4.4 mm on the right side and 4 mm on the left side of the mandible.

CONCLUSION

The present study establishes the incidence of retromolar foramen and its clinical significance. The retromolar foramen is highly variable in their morphology and morphometry. 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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