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Anatomical Variation of Mental Foramen. A case report

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SUMMARY

We have reported a case of triple mental foramina at the right side of the premolar region, which was discovered during reposition and ostheosynthesis of a mandible fracture. A review of the literature, was performed which disclosed no previous clinical cases reported but an incidence of 1.2% of triple foramina after investigating dry skulls or radiographics. The discussion stresses the importance of adequate preoperative radiological examination in the clinical situation especially when closed surgery is planned.

Key words: sensation, mental foramen, mental nerve, mandible fracture, vestibular incision.

INTRODUCTION

The mental foramen is a structure, through which the inferior alveolar nerve and blood vessels pass together to the buccal gingiva in front of the second premolars to the lower lip and chin. This nerve and vessels constitutes a part of nerve supply and blood circulation of the lower jaw and the skin of the lower face [1].

The mental nerves, is primarily a sensory nerve and innervate after leaving the foramen the lower canines and premolars and therefore play an important role in procedures in this area such as administration of local anesthesia and surgical intervention [1].

The absence and variation of accessory mental foramina has been reported in dry human mandibles and on radiographs previously [2], and can range from (0.2%) to (10.6%) on one side (Table 1).

A double mental foramen appears in approximately 1% on the left side in Egyptian and Polynesian populations and in 1.1% on the right side of a Melanesian group [3].

Gershenson et al. (1986) who examined 525 dry mandibles focusing on variation, shape and site of the mental foramen related to the teeth, reported that 4.3% mandibles had double mental foramina, and 0.7% mandibles had triple mental foramina. Finally they found one mandible that had four mental foramina on one side (0.1%) [4].

Serman (1989) examined 408 dry human mandibles and found one extra foramen on one side in seven mandibles constituting 1.7% and in two specimens bilateral double mental foramina. Altogether eleven double mental foramina were documented on 408 mandibular specimens (2.7%) [5].

In 1998 Sawyer et al. reported 5.9% accessory mental foramen in four ethnic groups and the maximum number found in any population was two [6].

In Thailand Stithipon (2005) and his colleagues studied 110 mandibles and found only two (1.8%), that had double mental foramina [7].

Katakami et el. (2008) examined 150 patients retrospectively with limited cone-beam computed tomography and depicted 16 double foramina (10.6%) and triple mental foramina on one side (0.6%) [8].

Naitoh et al. (2009) studied 157 patients using cone-beam computed tomography and found 11 patients that had double on one side (7%) and two (1.2%) that had triple mental foramina on the contra lateral side [9].

Available data are summarized in Table 1.

CASE REPORT

A 28-year-old male was involved in a road traffic accident resulting in bilateral condylar neck

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Fig. 1. Clinical appearance of three separate nerves, coming from three different foramina at the right side of the mandible

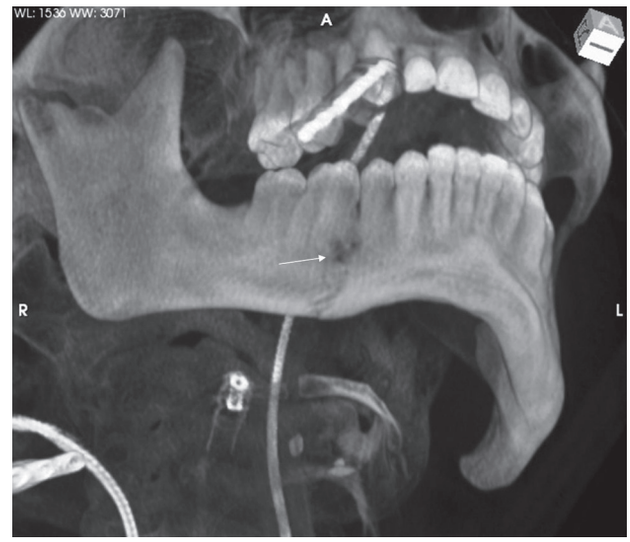

Fig. 2. Preoperative three-dimension computed tomography showing three mental foramina at the right side of the mandible

fractures of the mandible and an oblique fracture at the region of first molar on the right hand side.

Under general anesthesia arch bars were applied in the maxilla and mandible followed by inter maxillomandibular fixation (MMF) in order to achieve a correct occlusion.

A vestibular incision was then placed from the lower central incisor to the area distal of the first molar on the right hand side.

A muco-periostal flap was raised to the expected place of the mental foramina.

At that point we identified three separate bundles of nerves emerging from three different foramina. Realizing difficulties in adequately perform ostheosynthesis with mandibular plates in the present situation a submandibular approach was decided. This gave a better opportunity to expose, reposition and plate the fracture without interfering with the neuro vascular bundles. After completion of the ostheosynthesis the flap was repositioned and sutured and the MMF was released and elastics applied and kept for three weeks in order to manage the bilateral condylar neck fractures.

The immediate postoperative course and the primary healing were uneventful.

The patient was reviewed with regard to fracture stability, occlusion and any other possible complications such as sensory or motor disturbance but was without any complaints.

On final examination one year postoperatively the patient had a stable good occlusion and an acceptable mouth opening and without any nerve disturbances or any other problem.

DISCUSSION

After reviewing the literature to the best of our knowledge, this is the first clinical case documented and reported with a triple mental foramina discovered during surgical treatment of a mandible fracture.

While treating a mandibular fracture with open reduction and ostheosynthesis we expected to find one but found three foramina. We considered only two to be of significance due to the small diameter of the third nerve but took care not to damage any of the nerves (Fig. 1).

The function of these three nerves emerging through the foramina was not possible to determine neither while oper-

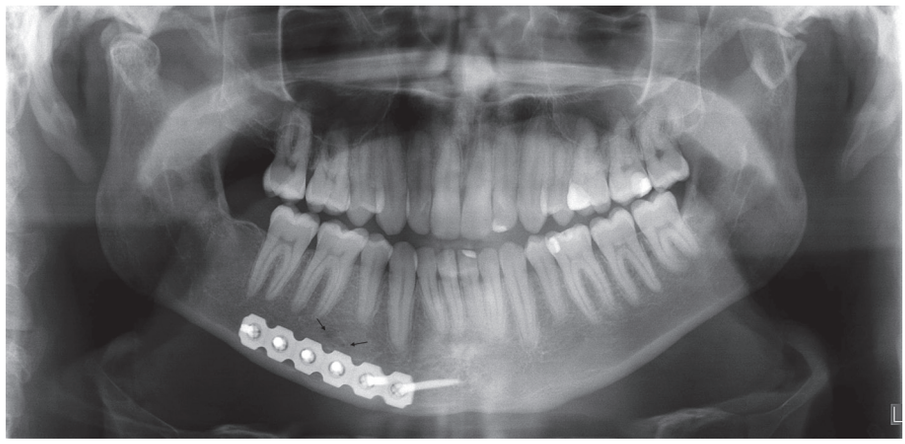

Fig. 3. Postoperative panoramic radiography showing only two mental foramina

Table. The incidence of variation of mental foramen in the literatures

Author	No. of Mandibles	Absence	%	Double	%	Triple	%	Quad-ruple	%
Riesenfeld (1956)	3987			197	4.9				
V. De Freitas (1979)	1435	3	0.2						
Gershenson A (1986)	525			23	4.3	4	0.7	1	0.1
Serman NJ (1989)	408			11	2.7				
Sawyer (1998)	705			42	5.9				
Stithipon (2005)	110			2	1.8				
Katakami (2008)	150			16	10.6				
Naitoh (2009)	157			11	7	2	1.2		

ating or afterwards. It is not known what clinical significance they had.

Postoperatively reviewing the preoperative computed tomography (CT) (Fig. 2), the first foramen was clearly depicted distally of the only existing premolar and the second foramen positioned apical of the mesial root of first molar. Finally the third minor foramen was observed in between the two.

On the postoperative panoramic x-ray only two foramina could be detected (Fig. 3). This confirms CT as is already well established, to be the method of choice, to investigate and describe anatomy. This is partly due to that CT has a low average distortion of 1.8%, compared to panoramic which has 23.5% and periapical radiographs 14% which is essential to be aware of when identifying delicate anatomical structures [10].

There are quite a few studies focusing on anatomical variations with a detailed description of the position of the foramina (Table).

The awareness of the possibility of the existence of anatomical variations in this region which is evident from reviewing the literature makes it essential to have access to preoperative high quality radiology and good ability to interpret the x-ray while planning surgery. By identifying this variation in advance the surgeon will be more careful in all procedures involving this region. This is true for any non open surgical procedure in this region. In implant dentistry flapless installation of osseointegrated dental implants is growing in popularity, which further stresses the need for x-ray of good quality and thorough planning.

In this patient the absence of one premolar made it difficult to relate the foramina to the premolars. The position of the mental foramen in a British population is reported to be 1.4% in the first premolar region, 40.5% between the premolars, 52.2% in the second premolar region, 5.4% between second premolar and first molar, and finally 0.3% in the first molar region [11].

After the finding of triple foramina we reviewed the literature to find out the incidence of variations. We found the double mental foramina was to be the most frequent variation, with an incidence of 1.8 to 10.6%, while the incidence of triple mental foramina was only 0.7 to 1.2% (Table). Taking these data in to consideration that double foramina have an incidence of up to 10.6 % there is an ample risk in non open surgery or less careful approach to the region to inflict nerve damage.

CONCLUSIONS

It was clear from reviewing the literature that variation of the number of mental foramina is not infrequent.

It is essential to be aware of the possibility of these anatomical variations already when planning surgery and when viewing the pre-operative radiological examination.

Thus we consider that it is important to report on the risk of anatomical variation of mental foramina, in order to avoid nerve damage in connection with surgical procedures.

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