Morphometric Study of the Retromolar Triangle

Estudio Morfométrico del Trígono Retromolar

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ABSTRACT: Presently study carried out an anatomical and morphometric analysis of the retromolar triangle and their relationships with the mandibular canal. Sixthy six adults mandibles were used without gender distinction, a sample of 120 retromolar triangles was identified and defined, each one of their sides was measured with a digital caliper and the number of present foramina in its area was counted. In an aleatory way 25 mandibles were selected to be traversely cut in the area of the retromolar triangle, and the distance was measured from the surface to mandibular canal. The area presented predominantly a triangular shape (80%), occupied by a variable number of little foramina, being more numerous those of small diameter. The medial side of the triangle was greatest (mean=15.91mm), while the anterior side was minor (mean=6.33mm). The area characteristics of the allow the anesthetic infiltration that diffuses until the mandibular canal.

KEY WORDS: retromolar triangle, mandible, inferior alveolar nerve, mandibular anesthesia.

INTRODUCTION

Retromolar triangle, is an area formed by the mandibular temporal crest bifurcation and the distal edge of last mandibular molar (Figún & Garino, 2001; Bilecenoglu & Tuncer, 2006).

This area, have a great variation relationed with the third molar presence and their impactation grade, or the mandibular teeth loss and the alveolar bone resorption (Iizuka *et al*., 1997).

Szycik *et al.* (2002) related that retromolar triangle bone can be used as autological graft in bone deficit osseointegrated implant cases.

Mucosal in relationship with retromolar triangle established the denominate piriformis papilla, post damming zone to mandibular prosthetics cheek support.

Retromolar triangle area present a foraminas variable number. Ossenberg (1987), described that retromolar holes of variable diameter can be found in different regions populations (North America, Afri-

ca, Europe, India, Asia North East); this retromolars holes and foramina enabled the pass of arterial branches provenanced of buccal artery that establish an inferior alveolar artery anastomosis (Kodera & Hashimoto, 1995).

From this observation Suazo (2000) propose the anesthesia difusion posibility from this cribosal area, to inferior alveolar nerve in the mandibular canal.

Present study implement an anatomical and morphometric study of retromolar triangle region and their mandibular canal relationship.

MATERIAL AND METHOD

It used 66 human mandible adult suject without gender distinction, who was someted to Bone-Technical habitual processed (Rodrígues, 2005), not banish veneer.

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In each one mandible was identify and demarcate left and right retromolar triangle area due to some cases the retromolar triangle are was destroyed, 120 retromolar triangles (64 rigth side and 56 left side) constituted the sample.

Each one retromolar triangle side was measurement by 0.01 mm sensitive digital caliper, in the cases of curves side played, their length was determinated through plastic thread used.

Once retromolar triangle was demarcate, using a dermatological light magnifying glass, zoom lens 10X, identificated and assess the located retromolar triangle foraminas, establishment their high diameter, and was categorized in small foramina, those with diameter inferior to 0.25 mm and big foraminas those whit a diameter superior to 0.25 mm.

To complete mandible observed, an aleatory sample was extracted 25 mandible, wich was dissected to medium retromolar segment level vertical line to the bone surface, bilateral way, using a electric band saw of vertical cut (Labre Armand ® 2HP Motor and 1400 RPM, 1mm width cut strip) then measure the thickness of the cortical, and distance from retromolar triangle surface to the upper cortical of mandibular canal.

The sample was analyzed by only one observer, the interclass correlation coefficient was established by means of subsample new measurement aleatory of 20 retromolar triangle.

The data obtained will be process in the SPSS 11.5 statistical software program and obtained the descriptive statisticians.

RESULTS

The intraobservant concordance was 0.89, value considered high, indicating a good consistency in the realized observations. Could be in all cases lateral and medial sides delineated, the greater proved to be the medial side (mean=15.91, SD=3.82), then the lateral (mean =15.10, SD=4.05) and the lesser length side was the retromolar triangle basis (mean = 6.33, SD=2.14), which could not be measured in all cases due 11 cases a tapering form presented, without anterior cortical wall.

Foraminas situated in a retromolar triangle surface were in small and greater classified, the number of foraminas found a high dispersion present. The small foraminas were those that in greater proportion were found, with an average of 27.05 small foraminas, with diameters between 0.04 mm and 0.25 mm; while the greater foraminas were found in lesser quantities, with an average of 9.5 per area of retromolar triangle with diameters between 0.04 mm and 0.25 mm; while the greater foraminas were found in smaller quantities, with an average of 9.5 per area of retromolar triangle and with diameters between 0.27 mm and 1.9 mm.

In the transversaly cut mandible, in area of retromolar triangle, the cortical thickness mean was 1.77 mm (SD 1.05) and the distance mean to mandibular canal was 9.71mm (SD 2.82).

The descriptive statistics for the retromolar triangle walls lengths, the foraminas number of and diameters of them, the cortical thickness and distance to mandibular canal can be shown in Table I.

Table I. Descriptive statisticians of the three retromolar triangle sides, foramina, cortical thickness and mandibular canal distances.

	n	Minimum (cm)	Maximum (cm)	Mean (cm)	SD (cm)
Anterior	109	1.8	12.1	6.3	2.1
Lateral	120	8.5	27.7	15.1	4.1
Medial	120	7.7	26.6	15.9	3.8
Little foramina	120	4.0	76.0	27.1	16.9
Greatest foramina	120	1.0	41.0	9.5	8.4
Little diameter foramina	120	0.04	0.25	0.1	0.1
Greatest diameter foramina	120	0.27	1.9	0.5	0.3
Cortical thickness	50	0.5	5.0	1.8	1.1
Cortical length - mandibular canal	50	3.3	16.2	9.7	2.8

The retromolar triangle form was variable, when teeth walls existed this adopt a triangular shape (80 %), otherwise the area acquired a tapering aspect (9.16%) or in drop form (10.83%) (Fig. 1).
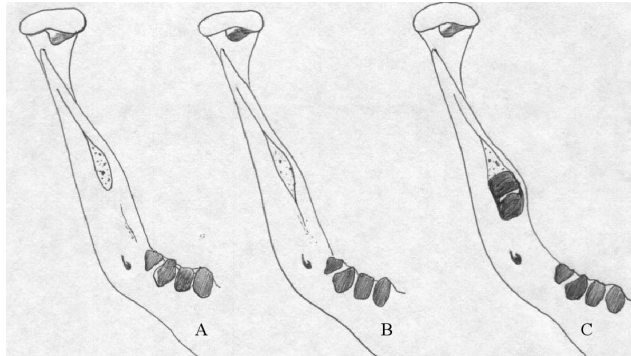

Fig. 1. Outline in the opposing ways of the retromolar triangle. A. Tapering form; B. Drop form; C. Triangular form.

DISCUSSION

In present study the presence and morphometrics characteristic of retromolar triangle was described, this form up result to be constant, in concordance with Ossenberg expressed, but with a great variability in its shape, dimensions and foraminas number; for Suazo the presence of these foramina allow the anesthetics solution diffuse may the leadership of inferior alveolar nerve block, with the advantage of being an easily accessible area, less painful. On the other hand, although proved important the distance from the cortical surface to mandibular canal (average 9.7, SD 2.8), most of this way spongy bone accounted for.

It likely that retromolar trigone allow the passage of arterial branches that play an important role in the supplementary irrigation in the molar region, like the lingual mandibular foramen, with important surgical implications (Vasconcellos *et al.*, 2000; Tay & Go, 2004; Bilecenoglu & Tuncer, 2006). Despite the limits described by Figún & Garino, the retromolar triangle presence does not depend of pieces tooth presence and presents a shape triangular when third molar or second molar there are to participate in its constitution. On the other hand the international anatomical nomenclature no reference to this training makes (Reyes & Nuñez, 1999; Feneis, 2000), which is why we suggest the name of cribose mandibular area to denominate this region.

RESUMEN: En el presente estudio se realiza un análisis anatómico y morfométrico de la región del trígono retromolar y sus relaciones con el canal mandibular. Se utilizaron 66 mandíbulas de individuos adultos, sin distinción de sexos. Se identificó y delimitó una muestra de 120 trígonos, cada uno de sus lados fue medido con un caliper digital y se contabilizó el número de forámenes presentes en su área. De manera aleatoria fueron seleccionadas 25 mandíbulas para ser seccionadas transversalmente en la zona del trígono retromolar y se midió la distancia de la superficie al canal mandibular. La zona presentó una forma mayoritariamente triangular (80%), ocupada por un número variable de forámenes, siendo más numerosos los de pequeño diámetro. El lado medial del trígono resultó ser el mayor (media=15,91mm), mientras que el menor fue el anterior (media= 6,33mm). Las características de la zona permiten la infiltración de una solución anestésica que difunda hasta el canal mandibular.

PALABRAS CLAVE: trígono retromolar, mandíbula, nervio alveolar inferior, anestesia mandibular.

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