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Morphometric Analysis of Pterygomaxillary Fissure

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ABSTRACT

Pterygomaxillary fissure is located in the medial aspect of infra temporal fossa.It connects the infra temporal fossa with the pterygopalatine fossa, and transmits the terminal part of the internal maxillary artery.It is created via the deviation of the maxilla through the pterygoid process of the sphenoid bone.The main aim of the study is to measure the pterygomaxillary fissure height, width and distance from articular tubercle, zygomatic temporal suture, zygomatic bone.30 unsexed dry human skulls were taken from the Department of Anatomy, Saveetha Dental College and Hospital. Digital vernier caliper was used for measuring the length and width of pterygomaxillary fissure and its distance from anatomical landmarks.The average height of pterygomaxillary fissure was 1.7cms, width was 0.3cms, distance from articular tubercle to upper border [A-B] was 4.1cms, zygomatic temporal suture [A-C] was 3.7cms, zygomatic bone [A-D] was 3.7cms respectively.Our study has tried to locate the position of pterygomaxillary fissure from the three anatomical landmarks, this data may be full for surgeons in planning their surgery in the infratemporal region

KEY WORDS: PTERYGOMAXILLARY FISSURE,ARTICULAR TUBERCLE,ZYGOMATIC TEMPORAL SUTURE,ZYGOMATIC BONE.

INTRODUCTION

Pterygomaxillary fissure is located in the medial aspect of infra temporal fossa and it is formed by divergence of maxilla from the pterygoid process of sphenoid bone (Eckerdal, 1991). It connects infratemporal fossa with pterygopalatine fossa (Dingman and Conley, 1970). It contains three borders anterior:posterior wall of maxillary sinus, superior: pterygoid process, inferior: pterygoid plate. The third part of maxillary artery pass through pterygomaxillary fissure from infratemporal to pterygopalatine fossa.posterior superior alveolar nerve pass through pterygomaxillary fissure,maxillary nerve continuous as infraorbital nerve(Tashi et al., 2016). Pterygomaxillary fissure along with nasal cavity form pterygomaxillary fossa. it is a small, clinically inaccessible, fat-filled space. It has connections between oral cavity, nasal cavity, nasopharynx, orbit, masticator space, and the middle cranial fossa, these connections with various deep spaces of head and neck acts as a passage for the spread of various inflammatory and neoplastic diseases (Erdogan, Unur and Baykara, 2003).

Most of the surgical procedures that have been used for the removal of lesions involving this area were extensive transcranial or transfacial approaches(Cavallo et al., 2005). In Lent zen study cone beam tomography image of population in pterygomaxillary fissure he classified the fissure into four types.Type 1 fissure present in mostly present in older male.Type 2 and 4 fissure are narrow and seen in younger patient.narrow fissure less than 2mm

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cause limit in insertion of neurostimulator implants in pterygomaxillary fissure (Lentzen et al., 2020).

Very few research was done on pterygomaxillary fissure, most of research work is on pterygomaxillary junction and pterygopalatine fossa (Shadlinskiy et al., 2017), since most of the research does not locate the measurement of pterygomaxillary fissure. So in our study we tried to locate the position of the pterygomaxillary fissure.

Previously our department has published extensive research on various aspects of dentistry (Begum et al, 2017; Ganapathy, Kannan and Venugopalan, 2017; Jain, 2017a, 2017b; Ranganathan, Ganapathy and Jain, 2017; Ariga et al., 2018; Gupta, Ariga and Deogade, 2018; Anbu et al., 2019; Ashok and Ganapathy, 2019; Duraisamy et al., 2019; Varghese, Ramesh and Veeraiyan, 2019), this vast research experience has inspired us to do research about morphometric analyse the length and breadth of pterygomaxillary fissure and to find the distance from anatomical landmarks.

MATERIAL AND METHODS

30 unsexed dry human skulls were taken from the Department of Anatomy, Saveetha Dental College and Hospital. Digital vernier caliper was used to measure the length and width in upper end of pterygomaxillary fissure and distance between upper part of fissure to articular tubercle(A-B), zygomatico temporal suture (A-C) and lower part of zygoma (A-D) was measured (Figure 1) on right and left side of skull. All the data was measured and analysed statistically.

RESULTS AND DISCUSSION

The height of pterygomaxillary fissure in the right side was in the range between 1.2cm to 2.1 cm average value is 1.7 cm. The width of the pterygomaxillary fissure in the upper end is in range between 0.1 to 0.4 cm. The distance from upper border of pterygomaxillary fissure to articulations tubercle [A-B] was in range between 3.6 to 4.6cm. The distance from upper part of pterygomaxillary fissure to zygomatic temporal suture [A-C] was in range between 3.1 to 4.3cm.The distance from upper part of pterygomaxillary fissure to base of zygomatic bone [A-D] was in range 3.4 to 4.3cm.[Table 1]. The height of pterygomaxillary fissure in the left side was in the range between 1.3 cm to 2.3 cm average value is 1.7 cm.

The width of the pterygomaxillary fissure in the upper end is in range between 02 to 0.3 cm. The distance from the upper border of pterygomaxillary fissure to articulations tubercle [A-B] was in range between 3.8 to 4.5cm. The distance from upper part of pterygomaxillary fissure to zygomatic temporal suture [A-C] was in range between 3.4 to 4.4cm.The distance from upper part of pterygomaxillary fissure to base of zygomatic bone [A-D] was in range 3.4 to 4.2cm.[Table 2]. In statistical analysis our study found that there is no significant difference in measurement between right and left side of pterygomaxillary fissure but there were differences from individual to individuals.

The width of pterygomaxillary fissure was 0.3cm which is similar to study done by stajcic et al, which was less than 0.2 cm (Stajcic et al., 2010) . Our study found that there was a significant difference in size of pterygomaxillary fissure among individuals. This was similar to another study in the pterygomaxillary region, It was due to Gender, age and dental status are critical factors that affect bone density in this region (Janfaza and Montgomery, 2011). In study of Wandee Apinhasmit he located the the position of maxillary artery in pterygomaxillary fissure.

Table 1. Various measurements of Pterygomaxillary fissure Right side in cms

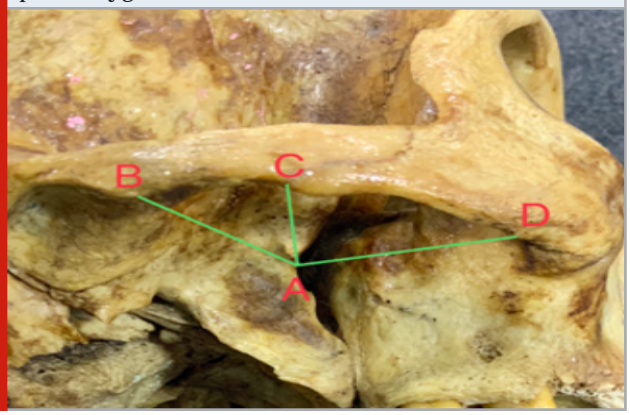
	Height	Width	Distance from articular tubercle (AB)	Distance from zygomatic temporal suture (AC)	Distance from base of zygoma (AD)
Minimum	1.2	0.1	3.6	3.1	3.4
Maximum	2.1	0.4	4.6	4.3	4.3
Average	1.7±0.25	0.3±0.07	4.1±0.26	3.7±0.30	3.7±0.20

Tablke 2. Various measurements of Pterygomaxillary fissure Left side in cms

	Height	Width	Distance from articular tubercle (AB)	Distance from zygomatic temporal suture (AC)	Distance from base of zygoma (AD)
Minimum	1.3	0.2	3.8	3.4	3.4
Maximum	2.3	0.3	4.5	4.4	4.2
Average	1.7± 0.21	0.3± 0.08	4.0± 0.19	3.8± 0.24	3.7± 0.20

The maxillary artery enter the pterygomaxillary fossa at distance 2.3mm above pterygomaxillary junction.This distance was longer in male than females (Methathrathip et al., 2005). Icen and Orthan study shows that the length and width of pterygomaxillary fissure was larger in male than females, the length was 17.7 mm which is similar to our study (Icen et al., 2020) . In Vardimon study in response to pterygomaxillary fissure to class 3 inter maxillary magnetic machine the lowermost pterygomaxillary fissure point was displaced inferiorly and anteriorly(Vardimon et al., 1994).

Figure 1: Pterygomaxillary fissure location from anatomical landmarks, A-pterygo maxillary fissure, B- articular tubercle, C - zygomaticotemporal suture, D- lower part of zygoma.



CONCLUSION

Since most of the research does not locate pterygomaxillary fissure from standard anatomical landmarks.our study has tried to locate the position of pterygomaxillary fissure from the three anatomical landmarks. This data may be useful for surgeons in planning their surgery in the infra temporal region.

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Conflict of Interest: The author declares that there is no conflict of interest in the present study

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