

A STUDY OF OCCURRENCE AND TYPES OF SUPRAMEATAL SPINES IN THE SUPRAMEATAL TRIANGLE

Preetha Parthasarathy

Under graduate
SIMATS
Saveetha Dental College,
162, Poonamalle high road,
Velappanchavadi,
Chennai- 600095.
India.

Mrs. M.S. Thenmozhi

Dept of Anatomy
SIMATS
Saveetha Dental College,
162, Poonamalle high road,
Velappanchavadi,
Chennai- 600095.
India.

Corresponding author:

Mrs. Thenmozhi. M.S

Dept of anatomy
SIMATS
Saveetha dental college,
Velappanchavadi
Chennai-600095
India

Running title: Types of suprameatal spines

ABSTRACT:

AIM: To identify the occurrence and types of suprameatal spines on either sides of the skull in the suprameatal triangle and to study their clinic implications.

OBJECTIVE: To figure out the presence of suprameatal spines in the suprameatal triangle and to review the literature on anatomical and clinic aspects of suprameatal triangle.

INTRODUCTION: Suprameatal triangle is present between the posterior wall of external acoustic meatus and posterior root of zygomatic process, in the temporal bone. It is also called as Macewen's triangle. Suprameatal spine is seen below the upper limit of the orifice of the inner end of external acoustic meatus which is closed by tympanic membrane. It is also called as spine of Henle.

RESULT: From the above conducted study, it can be seen that, when the suprameatal spines were evaluated according to its type and occurrence, the crest type of spine present was more than the triangle type. The crest type of spine was found to be 62.2% and the triangle type of spine was about 37.8%

CONCLUSION: Thus, this study shows the prevalence of crest and triangle type spine in the dry skulls evaluated. It can be concluded that the prevalence of "crest type" of spines were more than the "triangle type".

KEYWORDS: Crest, external acoustic meatus, mastoid process, suprameatal spine, suprameatal triangle,

INTRODUCTION:

The suprameatal triangle is located between the posterior wall of external acoustic meatus and posterior root of the zygomatic process, in the temporal bone. It's also called as Macewen's triangle. [1]

The suprameatal triangle is an area in the temporal bone. It's triangular shaped is formed by :

- The zygomatic arch root
- The posterior wall of external acoustic meatus
- A line that links the extremities of the zygomatic arch root and the posterior wall of acoustic meatus.[2]

Suprameatal triangle is bounded by:

- Supramastoid crest
- Posterior margin of external acoustic meatus
- Tangent from the crest to the margin[3]

The mastoid Antrum, in adults, lie about 15mm deep to the suprameatal triangle.[4]

The suprameatal triangle is of great importance to otologist. It's also important in surgeries and operations involving the mastoid Antrum, such as in case of mastoidectomy.[5]

During mastoidectomy, an instrument may be inserted into the mastoid Antrum through this triangle. [6]

Suprameatal spine, which is also called as the spine of Henle, is a small out crop of temporal bone, within the ear canal at the inferior posterior corner.[7] The spine marks the spot deep to which the mastoid Antrum can be seen.[8]

The suprameatal spine serves as an additional attachment point for the ligaments fixing the cartilaginous parts of external acoustic meatus and temporal fascia and muscle.[9] Suprameatal spine is of great importance to otologist due to its anatomical location.[10]

the suprameatal triangle cover the lateral wall of the mastoid antrum, it is seen as a useful anatomical landmark for otologic surgeons during mastoidectomy.[11]

The suprameatal depression may show a bony specule or crest in its anterior margin,the suprameatal spine which varies in shape,size and position.[12]

METHODS AND MATERIALS:

The study was done on 45 human adult dry skulls from the Department of Anatomy, Saveetha dental college, Chennai. The presence and types of Suprameatal spine was studied.

The anatomical landmarks used are:

- External acoustic meatus
- Mastoid process
- Supra mastoid crest

TABULATION:

<u>NO.</u>	<u>RIGHT AND LEFT</u>	<u>LEFT</u>	<u>RIGHT</u>
1.	27	8	10

Table: 1 - PRESENCE OF NUMBER OF SPINE

<u>No.</u>	<u>Side</u>	<u>Shape</u>
1	Right	Crest-6 (60%) Triangle-4 (40%)
2	Left	Crest- (62.5%) Triangle-3 (37.5%)
3	Right and left	Crest-17 (62.9%) Triangle-10 (37.1%)

Table: 2 - No. of crest shaped and triangle shaped spines present

<u>PERCENTAGE</u>	<u>CREST TYPE</u>	<u>TRIANGLE TYPE</u>
	62.2%	37.8%

Table: 3 - PERCENTAGE OF THE TYPES OF SPINE OBSERVED



Fig: 4 - Suprameatal spine- crest type



Fig: 5 - Suprameatal spine- triangle type

RESULT:

From the above conducted study, it can be seen that, when the suprameatal spines were evaluated according to its type and occurrence, the crest type of spine present was more than the triangle type. The crest type of spine was found to be 62.2% and the triangle type of spine was about 37.8%

DISCUSSION:

In this study, the suprameatal spine which is of great clinical significance was observed and evaluated. It was found that the “crest type” of spine was more than the “triangle type” of spine, which is on par with the research done by T.V. Peker, C.Pelin, B.Turgut, A.Anil, A.Sevim on “VARIOUS TYPES OF SUPRAMEATAL SPINES AND DEPRESSION IN THE HUMAN TEMPORAL BONE”. [4]

The above conducted study shows that 62.2% of the suprameatal spines are of crest type and 37.8% are of triangle type, which was evaluated on the dry skulls from Department of Anatomy, Saveetha dental college, Chennai.

Also, on the right side of the skull, the occurrence of suprameatal spine of crest type was found to be 60% and on left side to be 62.5% and on both right and left side to be 62.9% which when compared with the research done by T.V. Peker, C.Pelin, B.Turgut, A.Anil, A.Sevim on "VARIOUS TYPES OF SUPRAMEATAL SPINES AND DEPRESSION IN THE HUMAN TEMPORAL BONE" shows that the prevalence of crest type spine on right side to be as high as 77.6% and left side to be 80%. [4] Suprimeatal crests were observed commonly as a trace type only, on the male dry skulls (51.2%), though there was no such crest seen on most of the female skulls (54.4%). [13]

The types of suprimeatal spine (SMS), crest type was present in 20 male skulls (45.5%) and 20 female skulls (35.75%) on the right side, while it was present in 28 male skulls (63.6%) and 24 female skulls (42.9%) on the left side.

Triangular type was present in 12 male skulls (27.3%) and in 16 female skulls (28.6%) on the right side. while it was present in 8 male skulls (18.2%) and 16 female skulls (28.6%) on the left side, in a study conducted by Shalaby SA, Eid EM, Allam OA, Sarg NA, Metwally on Morphometric Study Of Mastoid Canal And Suprimeatal Triangle Of Human Egyptian Skull, With Gender Determination. [14]

In the genus *Meriones* ears are middle- sized, the tympanic bulla is large, and its mastoid part is much hypertrophied, the suprimeatal triangle is big and distinct in posterior part of the skull. [15]

CONCLUSION:

Thus, this study shows the prevalence of crest and triangle type spine in the dry skulls evaluated. It can be concluded that the prevalence of "crest type" of spines were more than the "triangle type". Also, the occurrence of crest type of spine was more on left side and on both right and left sides and then right side. The triangle type of spine was more on right side.

REFERENCES

- [1] Chaurasia BD. *BD Chaurasia's Human Anatomy*. CBS Publishers & Distributors Pvt Ltd.; 2010.
- [2] Peker TV, Pelin C, Turgut HB, Anil A, Sevim A. Various types of suprimeatal spines and depressions in the human temporal bone. *European archives of oto-rhino-laryngology*. 1998 Sep 8;255(8):391-5.
- [3] Bannister LH. *Gray's anatomy*. Williams PL, Warwick R, Dyson M, editors. Edinburgh: Churchill livingstone; 1989.
- [4] Turgut HB, Anil A, Peker T, Pelin C, Gülekon IN. Supraarticular, supramastoid and suprimeatal crests on the outer surface of the temporal bone and the relation between them. *Surgical and Radiologic Anatomy*. 2003 Dec 1;25(5-6):400-7.
- [5] Richany SF, Bast TH, Anson BJ. XXXV The Development and Adult Structure of the Malleus, Incus and Stapes. *Annals of Otolaryngology, Rhinology & Laryngology*. 1954 Jun;63(2):394-434.
- [6] Carolineberry A, Berry RJ. Epigenetic variation in the human cranium. *Journal of anatomy*. 1967 Apr;101(Pt 2):361.
- [7] Clarke JJ. Some observations on the temporal bone, chiefly in childhood. *Journal of anatomy and physiology*. 1893 Apr;27(Pt 3):411.
- [8] Hauser G, De Stefano GF. Epigenetic variants of the human skull.
- [9] Cunningham DJ, Brash JC. *Cunningham's Manual of Practical Anatomy Vol 3: Head and Neck: Brain*. OUP; 1952.
- [10] Saitou N, Kimura R, Fukase H, Yogi A, Murayama S, Ishida H. Advanced CT images reveal nonmetric cranial variations in living humans. *Anthropological Science*. 2011;119(3):231-7.
- [11] Kronenberg J., Baumgartner W., Migirov L., Dagan T. and Hildsheimer M.(2004): The Suprimeatal Approach: an alternative surgical approach to cochlear implantation. *Otol Neurotol*. 25(1):41-4.
- [12] Cummings C.W., Frederickson J.M., Harker L.A., Krause C.J. and Schuller D.E. (1993): *Otolaryngology: head and neck surgery*, 2nd edn. Mosby Yearbook, St Louis, pp 2487, 2989-2991
- [13] Berkovitz BK, Moxham BJ. *A textbook of head and neck anatomy*. Year Book Medical Pub; 1988.
- [14] Shalaby SA, Eid EM, Allam OA, Sarg NA, Metwally AG. Morphometric Study Of Mastoid Canal And Suprimeatal Triangle Of Human Egyptian Skull, With Gender Determination.
- [15] Momenzadeh MA, Darvish JA, Toutonyan F, Sarmad MA, Sadeghi Shakib F. Investigation of climatic effects on the shape and volume of tympanic bulla of *Meriones libycus* and *M. persicus* (Muridae: Rodentia) from Northeastern Iran: An evolutionary approach. *Iranian Journal of Animal Biosystematics*. 2011 Jul 19;4.