A Study Of Mastoid Foramen In Adult North Indian Crania

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Abstract: Background: Non metric cranial variants have always been a topic of considerable interest for research workers, as they possess racial, regional and sex dimorphic differences. These variants are also of anthropometric, genetic, morphological and forensic importance. Material and methods: 71 skulls from north indian region were studied for one of such variant, absence of mastoid foramen and presence of multiple mastoid foramen. Results: Incidence of absent mastoid foramen is 7.04 %, while bilateral incidence of absent mastoid foramen is only 1.4 %, however unilaterally mastoid foramen is absent in 5.63 %. (2.8 % on right side and 2.8 % on left side). Incidence of multiple mastoid foramina is 12.67 %, out of this it is bilateral in 8.45 %, however unilaterally it is present in 4.22 %. (1.40 % on right side and 2.81 % on left side).Conclusions: Findings are discussed and compared with other global studies and are found to be of considerable racial and regional significance. Knowledge of this variant is valuable in some neurosurgical and otolaryngeal procedures. [Singh K A et al NJIRM 2013; 4(2) : 36-38]

Key Words: absent mastoid foramen, multiple mastoid foramen, cranial variant

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Introduction: Mastoid foramen is a large foramen in posterior border of temporal bone. It transmits an emissary vein from sigmoid sinus and also a small dural branch of occipital artery.[1] Numbers of mastoid foramen often show variability. This foramen may not be present always or at some instances, there are multiple mastoid foramina present. Present study was undertaken to analyse the incidence of variations of mastoid foramen and also to draw significant conclusion.

Material and Methods: The present study was conducted in the Department of Anatomy of Rohilkhand Medical College, Bareilly in collaboration with Institute of Dental Sciences, Bareilly and M L N Medical College, Allahabad. For this study, a total number of 71 north indian human crania were analysed. Out of which 35 human crania were taken from museum of Anatomy and Forensic Medicine department of Rohilkhand Medical College & Hospital, Bareilly, 4 human crania from from Institute of Dental Sciences, Bareilly and 32 human crania from Anatomy department of M. L. N. Medical College, Allahabad.

In this study, two variants of mastoid foramen were noted.

1. Incidence of absence of mastoid foramen (figure-1)
   a. absent bilaterally
   b. absent unilaterally- right side
   c. absent unilaterally- left side
2. Incidence of presence of multiple mastoid foramina (figure-2)
   a. multiple mastoid foramina bilaterally
   b. multiple mastoid foramina present unilaterally- right side
   c. multiple mastoid foramina present unilaterally- left side

Though many small foramina are also seen in this region. Foramen/ foramina < 1 mm diameter were not taken into consideration. Care was exercised to differentiate mastoid foramen from mastoid canal as opening of mastoid canal might be confused as mastoid foramen.[2]

Result:

Table-1 Variants of Mastoid foramen in 71 human crania

		Absent Mastoid Foramen	Multiple Mastoid Foramina
Bilateral		1	6
Unilateral	Total	8	6
	Right Sided	4	2
	Left Sided	4	2

Out of 71 human crania, mastoid foramen was absent only in 9 crania (1 bilateral, 4 on left side and 4 on right side). Thus over all incidence of absent mastoid foramen is 7.04 %, while bilateral incidence of absent mastoid foramen is only 1.4 %,

however unilaterally mastoid foramen is absent in 5.63 %. (2.8 % on right side and 2.8 % on left side) (figure-1)

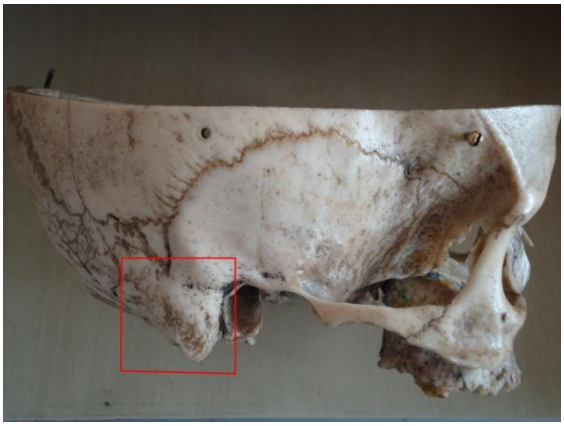
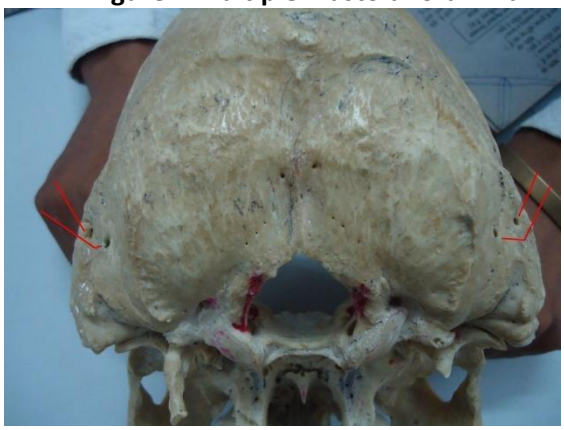


Figure -1 absent mastoid foramen

Out of 71 human crania, 12 crania showed presence of 2 mastoid foramen (6 bilateral, 2 on right side and 4 on left side). Thus the incidence of multiple mastoid foramen is 12.67 %, out of this it is bilateral in 8.45 %, however unilaterally it is present in 4.22 %. (1.40 % on right side and 2.81 % on left side) (figure-2)

Figure-2 multiple mastoid foramina



Discussion: In the present study, overall incidence of absence of mastoid foramen in north Indian population was 7.04%, which was almost equivalent to the incidence noted in South American (7.5%) and Burmese (7.8%) population[3], while the same study showed the higher incidence in other population.[3] The incidence was liitle higher in Korean population (11.94%) [4], but in contrast it was much higher in Turkish Anatolian population (21.5%). [5]

In our study, mastoid foramen was absent on both side in 1.40%, absent on right side in 2.82% and 2.82% on left side. The findings were consistent with the study of Kim et al[4] in which incidence of bilateral absence was 1.49%, absence on right side was 7.46% and absence on left side was 2.96%. In yet another study done by Boyd[6] showed bilateral absence of this foramen in 31.9%, 16.1% on right side and 17.6% on left side.

Regarding the incidence of multiple mastoid foramina, overall incidence in our study found was 12.67%, which was little higher as compared to the study of Boyd[6], who found it in 10.8%. Similarly in our study, multiple foramen on both side were found in 8.45%, on right side 1.41% and on left side 2.81%, but we could not find any other study showing data of incidence of multiple mastoid foramen unilaterally.

Conclusion: Hence the current study provides valuable information regarding mastoid foramen from north Indian region and compares the same with the data of different global regions. Of course, these variations would have great clinical significances during the neurosurgical and otolaryngeal surgery. These data would also contribute to study epigenetic study of minor variations of skull and anthropological study.

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Conflict of interest: None
Funding: None