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A Study of the Incidence of the Carotico clinoid Foramen in Human Dry Adult Skull Bones in the Department of Anatomy, JNIMS, Manipur

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Abstract: *The carotico clinoid foramen is an osseous bridge between the tip of the middle and anterior clinoid processes .The present study was conducted in the Department of Anatomy, JNIMS, Manipur, on 40 dry skull bones. The skulls were observed for the presence or absence of the carotico clinoid foramen. When present, it was observed whether the particular carotico clinoid foramen was present unilaterally or bilaterally, complete or incomplete. Tables were generated by using the data and incidences were calculated by statistical analysis. Out of 40 skulls, carotico clinoid foramina were present on 3 skulls (**7.5%)**. Out of 40 skulls incomplete carotico clinoid foramen was present on 1 skull (**2.5%**). Two skulls out of 40 skulls were observed to bear complete foramina (**5%**).Total number of carotico clinoid foramina were 5 of which 4 were present bilaterally (**5%**)(2 right and 2 left) and 1 was present unilaterally (**1.25%**)on the left side. Total number of foramina on right is 2(**2.5%**) and that on the left is 3(**3.75%**).*

Key words*: carotico clinoid foramen, anterior clinoid process, middle clinoid process and internal carotid artery*

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I. Introduction

The carotico clinoid foramen, first described by Henle (1855), is an osseous bridge between the tip of the middle and anterior clinoid processes. The ossification of the ligamentous structures in various parts of the body may result in a clinical problem such as compression to neighbouring structures or complications in regional surgery. Research studies have also reported the fact that an ossified carotico clinoid ligament makes the removal of anterior clinoid process more difficult, especially in the presence of an aneurysm.[1]The present study aims at finding the incidence of carotico clinoid foramen.

II. Materials And Methods

The study is a cross sectional study carried out on 40 dried adult human skulls of unknown sex at the Department of Anatomy, JNIMS, Manipur, during september, 2018. The skulls were observed for the presence or absence of the carotico clinoid foramen. When present, it was observed whether the particular carotico clinoid foramen was present unilaterally or bilaterally, complete or incomplete. Photographs were taken for these findings. Finally, tables were generated by using the data and incidences were calculated by statistical analysis.

Inclusion criteria: Dry unknown human skulls which were well ossified were taken

Exclusion criteria: Fragmented, Broken skull bones were excluded from the study.

III. Results

Out of 40 skulls, carotico clinoid foramina were present on 3 skulls (**7.5%)**. Out of 40 skull bones incomplete carotico clinoid foramen was present on 1 skull (**2.5%**). Two skull bones out of 40 skull bones were observed to bear complete foramina (**5%**).Total number of carotico clinoid foramina were 5 of which 4 were

present bilaterally (**5%**)(2 right and 2 left) and 1 was present unilaterally (**1.25%**)on the left side. Total number of foramina on right is 2(**2.5%**) and that on the left is 3(**3.75%**).

RIGHT SIDE	LEFT SIDE		TOTAL
	3		
2	1 UNILATERAL	2	5

Table 1: Showing presence of carotico clinoid foramen on right and left sides

UNILATERAL		BILATERAL	TOTAL
RIGHT	LEFT	2 COMPLETE	3
0	1 INCOMPLETE		

Table 2: Showing skulls with carotico clinoid foramen

UNILATERAL		BILATERAL		TOTAL
LEFT	RIGHT	LEFT	RIGHT	5
1 INCOMPLETE	NIL	2 COMPLETE	2 COMPLETE	

Table 3: Showing number of carotico clinoid foramen

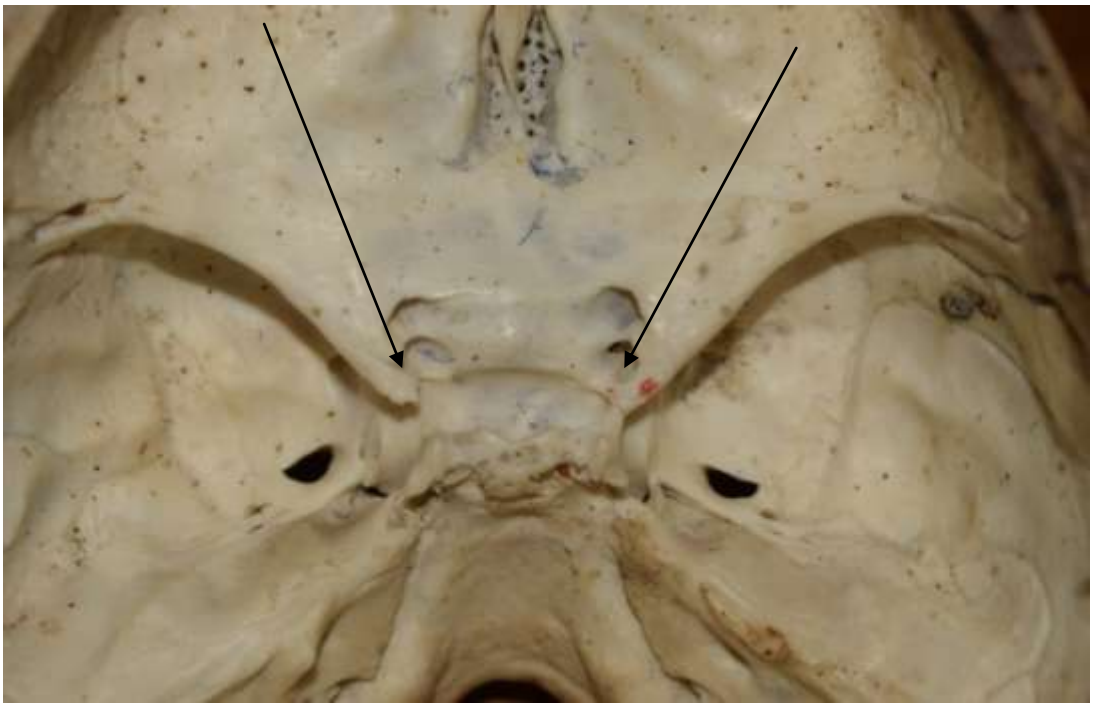

Figure 1: Showing bilateral complete foramen

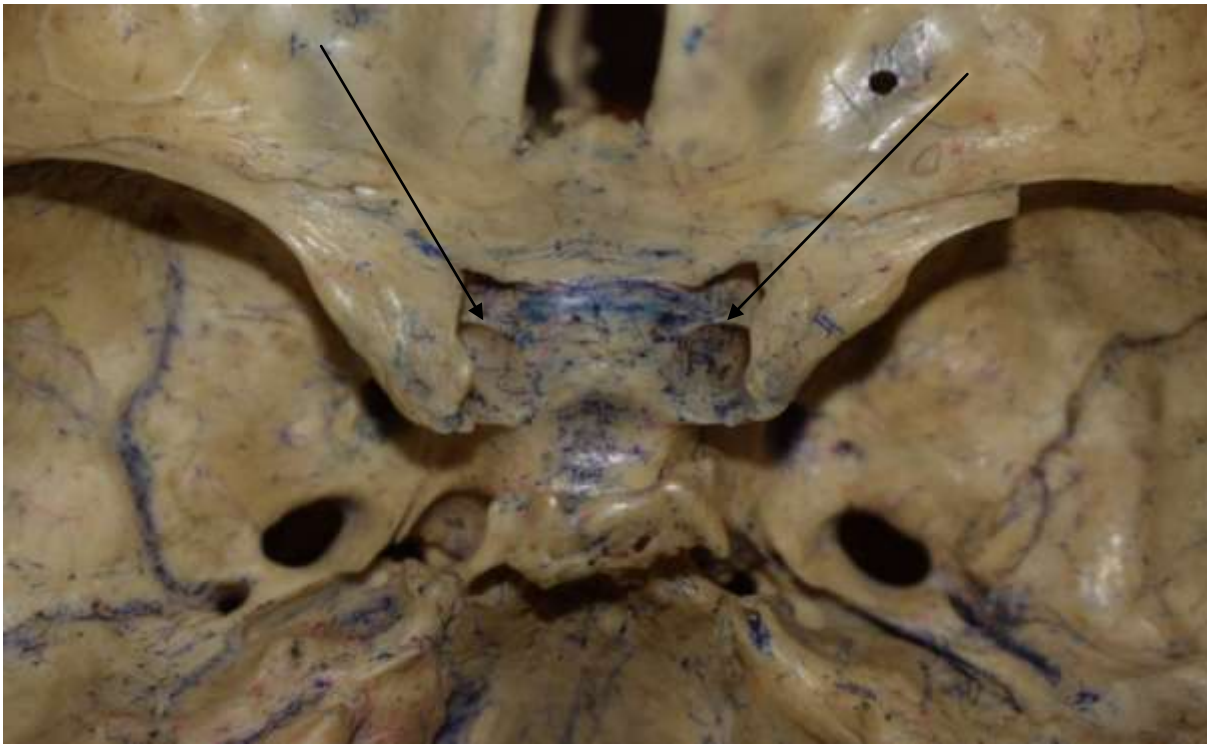

FIGURE 2: Showing bilateral complete foramen

FIGURE 3: Showing unilateral incomplete left foramen

IV. Discussion

AUTHORS	UNILATERAL%	BILATERAL %	COMPLETE %	INCOMPLETE %	LEFT %	RIGHT %	INCIDENCE%
Cireri et al (1990)	6						6
Lee (1997)			4.1	11.6			15.7
Gupta (2005)			6	16			22
Desai(2010)	23.74	13.45	17.47	19.71	17.48	19.73	37.19
Sonabar(2012)	10	14	8	16	8	16	24

Saurabh(2017)	14.28	5.72	11.43	8.57	2.85	17.14	20
Present study(2018)	1.25	5	5	2.5	3.75	2.5	7.5

Table 4: Comparative analysis of present study with related studies

In the present study involving 40 skull bones,incidence of presence of carotico clinoid foramen was found to be 7.5%.Foramen were present on the right side and left side of the skulls in 2.5% and 3.75% respectively. The foramina were complete in 5% and in 2.5% they were incomplete. The foramina were unilateral and bilateral in 1.25% and 5% respectively. A comparision has done with related studies as shown in table 4 above. The incidence of the present study (7.5%) is closely related to that of Cireri et al (1990).[1]The incidence of the studies of Desai(2010),[1] Gupta (2005),[2] Sonabar(2017),[3] Saurabh(2017),[4] Lee (1997)[5] yielded higher incidences as shown in the table 4. In the studies conducted by Desai(2010)[1], Sonabar(2017)[3] and Saurabh(2017)[4] the incidence of foramen was found to be more common on the right side unlike the present study .The incidence of bilateral foramen (5%) is much closer to that of Saurabh(2017)[4].

V. Conclusion

Knowledge of the prevalence of carotico clinoid foramen helps the neurosurgeons for preoperative scanning and precautions can be taken to prevent fatal complications during surgery.[1] The osseous carotico clinoid foramen is an underestimated structure which has important neuronal and vascular relations and is both clinically and surgically important.[1] The carotico clinoid ligament connecting anterior and middle clinoid processes sometimes get ossified forming the carotico clinoid foramen which transmits one of the segments of internal carotid artery. Ossification of interclinoid ligament that connects the anterior and posterior clinoid processes is termed as interclinoid osseous bridge or sella turcica bridge.[6] The present study has made a humble attempt in this regard by studying incidence of carotico clinoid foaramen in the Department of Anatomy,JNIMS, Manipur.

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