Occurrence of caroticoclinoid foramen and inter clinoid bar in dry human skulls and their clinical significance

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ABSTRACT

Aim: The aim of the study was to observe the occurrence, anatomy and clinical significance of caroticoclinoid foramen and inter clinoid bar in the dry human skulls available in the Department of Anatomy in Saveetha Dental College. Materials and Methods: A total of 50 dry adult human base skulls that are available in the Department of Anatomy, Saveetha Dental College are used for the study. Digital Vernier caliper was used in taking the measurements. Results: The incidence of caroticoclinoid foramen and inter clinoid bar is 58% and 0%, respectively. There is no incidence of complete and contact type caroticoclinoid foramen. However, the results tend to vary in different regions and population of the world. As only a limited number of skulls were considered for the study, the result might vary with consideration of more number of skulls. Conclusion: The clinical significance is that the presence of caroticoclinoid foramen and inter clinoid bar may serve as obstacles while approaching anterior clinoid process in the regional neurosurgery, especially when there is an aneurysm of internal carotid artery. Therefore, detailed anatomical knowledge is required while operating in this region.

KEY WORDS: Caroticoclinoid, Dry skulls, Inter clinoid

INTRODUCTION

The caroticoclinoid foramen [Figure 1] is an osseous bridge formed between the tip of the middle clinoid process and the anterior clinoid process. It was first described by Henle in the year 1855. The inter clinoid bar is also an osseous bridge which extends from the anterior clinoid process to the posterior clinoid process. These two are formed either due to the ossification of caroticoclinoid and inter clinoid ligaments or ossification of dural folding which extends between the anterior and middle clinoid processes of the sphenoid bone. They are ossified in the early childhood period. This region is clinically very important because it is closely related to the internal carotid artery, cavernous sinus, and its contents. The internal carotid artery is called the artery of anterior circulation. It supplies most of the forebrain. The artery has got four divisions. They are the cervical part, petrous part, cavernous part, and the cerebral part. The internal carotid artery runs medially and forward to the anterior clinoid process by traversing the cavernous sinus and emerging at the dural roof of the cavernous sinus. The internal carotid artery then enters the subarachnoid space. It is surrounded by two dural rings called the distal dural ring and the proximal dural ring. The internal carotid artery between these dural rings is called the clinoidal internal carotid artery. In the case of regional surgery for tumors or neurosurgery related to cavernous sinus, the anterior clinoid process has to be removed. In that case, the presence of caroticoclinoid foramen and the inter clinoid bar may cause some obstacles. There is also a risk of damaging the clinoidal internal carotid artery during these surgical approaches. They have been reported to have a high incidence in subjects with hormonal derangement, idiots, criminals, and epileptics. Hence, a detailed anatomical knowledge is very important while performing any surgery in this region. This study aims at providing that knowledge.

The aim of this study is to observe the incidence, anatomy and clinical significance of caroticoclinoid foramen and
inter clinoid bar in the dry human skulls available in the Department of Anatomy in Saveetha Dental College.

**MATERIALS AND METHODS**

A total of 50 adult dry human skulls that were available in the Department of Anatomy of Saveetha Dental College are used for the study. Digital Vernier caliper was used in taking the measurements.

**RESULTS AND DISCUSSION**

From Table 1, we could analyze that there was no incidence of complete and contact type caroticoclinoid foramen. However, we could see an incidence of about 58% of incomplete type caroticoclinoid foramen. Of that 58%, 32%, i.e., about 16 skulls had unilateral
caroticoclinoid foramen and 26%, i.e., 13 skulls had bilateral caroticoclinoid foramen. Moreover, there was no incidence of inter clinoid bar in any of the skulls. To
Figures 2 and 3 show the mean of vertical and transverse length of the left caroticoclinoid foramen, respectively. The skulls used were segregated as male and female skulls, and then the study was conducted. In the case of left caroticoclinoid foramen, there is no much difference in the vertical length of the foramen in male and female skulls but, we could see a slight difference in the transverse length of the foramen in the male and female skulls. From Figure 4 and 5, we could infer that the values are not much deviated in females rather than males. This statistics would be useful in performing neurosurgery in this region.

In the same way, the mean of vertical and transverse length of right caroticoclinoid foramen is taken.

give detailed anatomical knowledge, the vertical and transverse dimensions of the caroticoclinoid foramen and the gap between anterior and posterior clinoid processes; anterior and middle clinoid processes are measured on both sides.
The mean of vertical length of right caroticoclinoid foramen is found to be slightly higher in females whereas the mean of transverse length of right caroticoclinoid foramen is found to be slightly higher in males than in females. When we compare Figures 2, 3, 6, and 7; the mean values of both vertical and transverse dimensions are found to be higher in left caroticoclinoid foramen than in the right caroticoclinoid foramen.

Similarly, the gap between the anterior and posterior clinoid processes; anterior and middle clinoid processes are measured on both the sides. From Figure 10, we could infer that the mean gap of left anterior and posterior processes is higher in males than in females. The mean gap of the left middle and posterior process is also higher in males than in females, which could be inferred from Figure 11. Figures 12 and 13 show that the values are not much deviated.

From Figure 14-17, we could infer that the mean gap between right anterior and posterior clinoid processes is found to be slightly higher in females than in males. Comparing Figures 10, 11, 14, and 15; the mean values of gap between anterior and posterior clinoid processes are found; anterior and middle clinoid processes, in males are found to be higher in the left side than in the right side, whereas in females the values are found to be higher in right side than on the left side.

From our study, it is clear that the incidence of caroticoclinoid foramen and inter clinoid bar is 58% and 0%, respectively. There is no incidence of complete and contact type caroticoclinoid foramen. However, the results tend to vary in different regions and population of the world. As only a limited number of skulls was considered for the study, the result might vary while considering more number of skulls.

REFERENCES


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