

## Case Report

# The Ossified Caroticoclinoid Ligament and Interclinoid Ligament in a Specimen of Sphenoid Bone: A Case Report

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**Abstract:** The interclinoid ligaments between the anterior, middle and posterior clinoid process are occasionally ossified. A bony bridge between the anterior and middle clinoid process and another between the anterior and posterior clinoid process was found in a dry specimen of one adult sphenoid bone. It was found bilaterally, like a ring around the sella turcica. The occasional presence of this ossified interclinoid ligament may compress the internal carotid artery, interrupting the blood flow and may also compress the cranial nerves. So, the anatomical knowledge of such ossification is important and should be kept in mind and evaluated before proceeding to skull based surgery around the sella turcica region.

**Keywords:** Anterior clinoid process, Posterior clinoid process, Interclinoid ligament, sphenoid bone, sella turcica..

## INTRODUCTION

The anterior clinoid process is joined to the middle clinoid process by caroticoclinoid ligament, which is sometimes ossified. The interclinoid ligament between the anterior and posterior clinoid process is occasionally ossified [1]. The presence of the ossified interclinoid connections are significant in surgical procedure around the sella turcica region and may manifest clinical symptoms.

In this context, a case of ossified ligaments around the sellaturcica region in a specimen of sphenoid bone is being presented.

## CASE REPORT

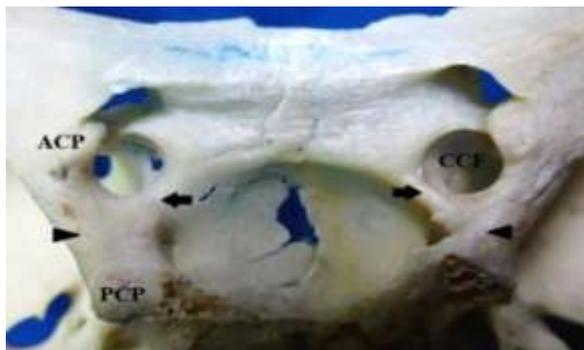
The anatomical structures in a dry specimen of an average adult sphenoid bone, which was collected from the departmental bone store, were observed and findings were noted down. The morphometric measurement of the bony bridge between the anterior clinoid process, middle clinoid process and posterior clinoid process was noted and the bone was photographed with Canon IXUS 130 camera.

A bony bridge between the anterior and middle clinoid processes and between the anterior and posterior clinoid processes were found in a dry specimen of one sphenoid bone. It is due to ossification of the caroticoclinoid and interclinoid ligament respectively and was found bilaterally forming a ring around the sella turcica. The length of the bony bar between the anterior

and posterior clinoid process was 8 mm. both in right and left side. The interclinoid distance between the two anterior clinoid processes was 28 mm. and between the two posterior clinoid process was 20 mm. Caroticoclinoid foramen was also found bilaterally between the anterior clinoid process and middle clinoid process.



**Fig. 1: General view of the cranial surface of sphenoid bone showing bilateral ring like ossification of ligaments around the sellaturcica region. ACP- anterior clinoid process, PCP- posterior clinoid process, MCP- middle clinoid process**



**Fig. 2:** A closer view on the sellaturcica region. The bilateral ossified caroticoclinoid (arrow) and interclinoid ligaments (arrowhead) are shown. CCF-caroticoclinoid foramen.

## DISCUSSION

The medial end of the lesser wing of sphenoid bone forms the anterior clinoid process (ACP) which provides attachment to free margin of the tentorium cerebelli, and is grooved medially by internal carotid artery. The ACP joined to middle clinoid process (MCP) by caroticoclinoid ligament which is sometimes ossified and may result in formation of caroticoclinoid foramen (CCF) [1].

The ossified ligaments form sellar bridge between ACP and posterior clinoid process (PCP). Sellar bridge formation may be developmental or may be due to chemical compounds. This may be due to calcium deposition on soft tissue (protein dependant) and ranges from minimal to massive and clinically significant [2, 3].

It is a rare finding in human being and unilateral ossification is more common than bilateral. Bilateral complete ossification was found by Ozdogmus *et al.* in 6% population [4].

The incidence of ossified interclinoid ligament was described as 4% by Inoue [5], 7% by Muller [6], 5.9% in dry skull specimens by Platzer [7], and 8.68% by Keyes [8].

Becktor *et al.* found a prevalence of 18.6 % of this structure in a sample of 177 subjects with abnormalities in craniofacial development [9]. Leonardi *et al.* observed a high prevalence in subjects with abnormalities in dental eruption [10].

Interclinoid ligament bisects the wall of cavernous sinus in to two triangle carotid trigone anteromedially and oculomotor trigone posterolaterally. Thus ossification of this ligament may influence such structure as the internal carotid artery or oculomotor nerve [11].

Surgical removal of the anterior clinoid processes in ophthalmic segment aneurysms and tumors located in the paraclinoid region & cavernous sinus is more

difficult when the interclinoid ligament is ossified, due to the established neural and vascular relationships (oculomotor, trochlear, abductor, ophthalmic and mandibular nerves, internal carotid artery, cavernous sinus and coronary sinus) [4, 12].

Besides that, pneumatization of the ACP should be evaluated preoperatively with computed tomography to avoid complications such as rhinorrhea and pneumocephalus [12].

In 60% of ACPs are pierced by narrow venous canals arising from the cavernous sinus and traversing through the clinoid space and are considered to be a potential source of bleeding during removal of the ACP [13].

## CONCLUSION

The anatomical knowledge of such ossified interclinoid ligament in sphenoid bone around sella turcica region is important from clinical and surgical point of view and should be kept in mind for diagnostic purpose and should be evaluated before proceeding to skull based surgery around the sellaturcica region.

## Presentation at a meeting

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