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Ponticulus Posticus- The "Aching" Bridge

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Abstract:

The Ponticulus posticus is a bony bridge located in the posterior arch of the atlas. It houses the passage of the vertebral artery. Its presence has been associated with development of cervical pain, migraine and diplopia, to name a few. The purpose of this study was to assess its prevalence in asymptomatic patients. We examined 500 digital lateral cephalograms of patients aged from 16 to 28 years. 16% of cases, showed some degree of ossification. As indicated by this study, it is a not an uncommon anomaly in the Indian population. Thus, care must be taken to account for it on lateral cephalograms of patients. If any such anomaly is detected or suspected, it must be documented in the patient's health record and specialist consultation must be sought.

Keywords: Ponticulus posticus; Atlas; Verebral artery; Cervical pain; Migraine

Introduction

There are 7 cervical vertebrae, the first one is atlas vertebrae supporting the skull. The atlas vertebrae is a ring-like structure consisting of two lateral masses connected by a short anterior arch and a longer posterior arc. On its upper surface is a wide groove for the vertebral artery and the first cervical nerve.

The ponticulus posticus is a bony arch that connects the retroglenoid tubercle located posterior to the superior articular fossa of the atlas with their posterior arch.

ETIOLOGY

- Congenital Development
- A Genetic Trait
- Ossification Due To Age
- The Result of External Mechanical Factors

CLINICAL -IMPLICATIONS

- Migraine without aura
- Headache
- Vertigo
- Diplopia
- Pain in shoulder, arm, neck
- Thrombosis Of The Vertebro-Basilar Arterial System

AIM

The aim of our study was to investigate the prevalence of Ponticulus Posticus in Mathura population (UP, INDIA).

OBJECTIVES

1. To identify types of ponticulus posticus(partial or complete)
2. To determine the gender predilection for partial and complete ponticulus posticus.

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MATERIALS AND METHODS

538 Lateral cephalograms were taken retrospectively, out of which 500 were selected for further evaluation, out of which 250 were males and 250 females.

INCLUSION- CRITERIA

- Males and females between ages 16-28
- Should not have any history of trauma in the cervical spine region.

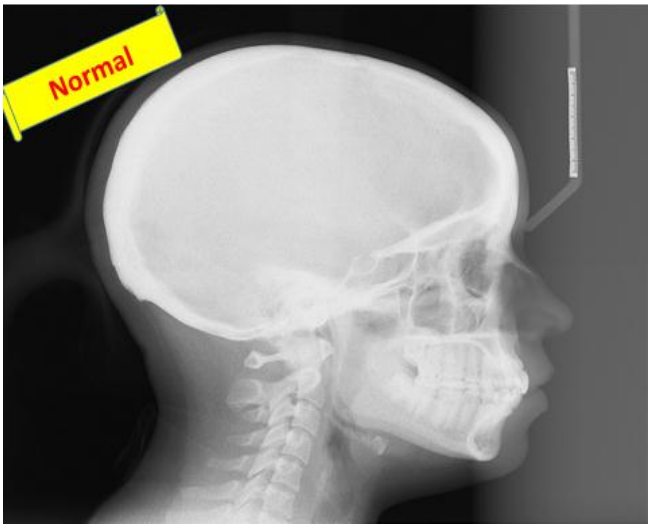
EXCLUSION CRITERIA

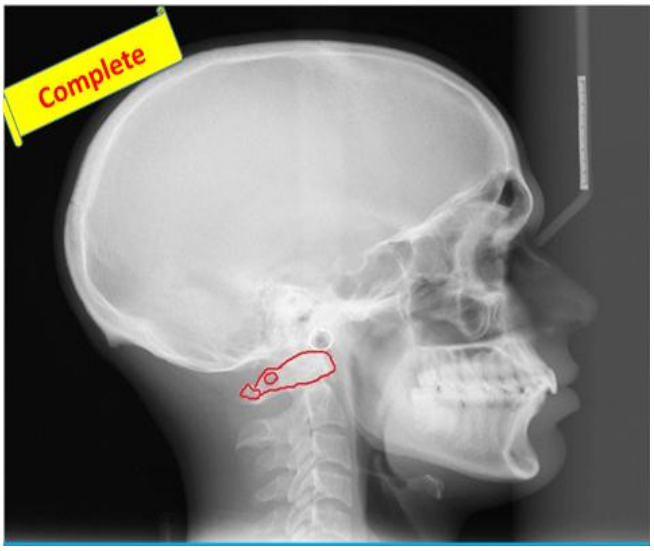
Radiographs that showed-

- Lateral inclination of the posterior arch of the atlas
- Mastoid process overlap on the body and the posterior arch of the atlas.

The digital lateral cephalograms were taken with ProMax II Digital panoramic X-ray unit.

Identification on lateral cephalograms -





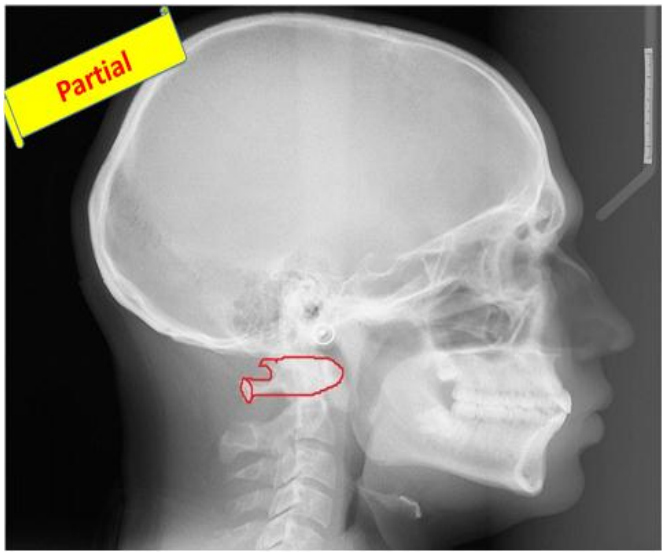


Table 1-Prevalence Associated With Gender

	PRESENT	ABSENT	TOTAL
MALE	46 (18.4%)	204 (81.6%)	250
FEMALE	34 (13.6%)	216 (86.4%)	250
p- VALUE	0.007 (S)	0.084 (NS)	500

Table 2-Distribution of Types of Ponticulus Posticus

STUDY GROUP	PRESENCE OF PONTICULUS POSTICUS		
	PRESENT		ABSENT
	PARTIAL	COMPLETE	
Male (250)	41 (16.4%)	5 (2%)	204 (81.6%)
Female(250)	28 (11.2%)	6 (2.4%)	216 (86.4%)
Total (500)	69 (13.8%)	11 (2.2%)	420 (84%)

Discussion

In our study, 500 lateral cephalograms were evaluated for the presence of ponticulus posticus in Mathura Population. The presence of ponticulus posticus was found to be 16%, which was found to be consistent with Kendrick et al.(1963) who found a rate of 15.8%.Other authors have found a rate of 15% (Lamberty et al 1973), and 11.7% (Cakmak et al).

The complete type of ponticulus posticus was found to be 2.2% while the partial type had a prevalence of 13.8%. Simsek et al.(2008) found a prevalence of 5.6% with a partial and 3.8% with a complete ponticulus posticus. In another study by Lamberty & Zivanovic , 15% the ring was complete, and 21.6% had partial ring.

The prevalence of ponticulus posticus in our study in males was found to be 18.4%, while in other studies it was 16%(Kim et al 2007), 12.5% (Taakaki et al 1979) and 5.3% (V. Sharma et al 2010) . The prevalence rate for females in our present study was 13.6%, which is higher than in other studies. Kim et al got a prevalence of 13%, while Takaki et

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al found a rate of 2.2%. Cakmak et al(2006) found a prevalence rate of 8.45%.

The variations can be due to racial and geographic distribution of the sample, as it has been taken from Mathura population. The variations in gender prevalence rates maybe due to the fact that till now, unequal sample sizes for males and females have been taken.

Limitation

Determining their location (unilateral or bilateral)

Identifying the affected side of atlas

Conclusion

As indicated by this study, it is a not an uncommon anomaly in the Indian population. Thus, care must be taken to account for it on lateral cephalograms of patients.

If any such anomaly is detected or suspected, it must be documented in the patient's health record and specialist consultation must be sought.

A CT scan can be used to substantiate the size and morphology of the ponticulus, if required.

The cephalogram must thus be looked upon as a baseline screening tool for detecting anomalies and pathology in the cervical spine region.

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