

# Accessory Foramen Transversarium and Its Incidence in South Indians Dried Cervical Vertebrae.

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## Abstract :

### Aim :

To find incidence and clinical correlation of accessory foramen transversarium in cervical vertebrae.

### Objective :

To understand various variations in presence of Foramen transversarium and its accessory counterparts are necessary for clinicians to know, for a safer and effective posterior approach.

### Background :

In vertebrates, cervical vertebrae are the vertebrae immediately below the skull. Among the vertebra, the cervical vertebra are the thinnest and most delicate bones. In spite of their size, the cervical vertebrae have the great work in supporting the head, protecting the spinal cord, and providing mobility to the head and neck. Foramen transversarium is a specific feature which is present in the transverse process of cervical vertebrae. In all cervical vertebrae except 7<sup>th</sup>, the foramen transversarium transmits vertebral artery, vein, and sympathetic fibres from inferior cervical ganglion. In 7<sup>th</sup> vertebrae, vertebral veins traverses in front of the transverse process and not through the foramen.

### Reason :

This study is important for orthopaedic surgeons, neurosurgeons, radiologists, physiotherapists and many other clinical surgeons to understand incidence, variation and its clinical importance of accessory foramen transversarium to avoid misdiagnosis in their clinical practice.

**Keywords :** Cervical vertebra, foramen transversarium, accessory foramen transversarium.

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## INTRODUCTION :

The cervical spine is comprised of seven vertebrae – C1-C7. It begin at the base of the skull and extend down to the thoracic vertebrae. The cervical vertebrae are composed of irregular bones also called vertebral bones enclosing the spinal cord, and work with the muscles, joints, ligaments and tendons to provide support, structure and stabilisation to the neck. The first cervical vertebra is unique in that it is a ring that rotates around the second vertebral odontoid. The cervical vertebrae closest to the skull are the smallest. All of the cervical vertebrae are smaller than the vertebrae in the thoracic and lumbar vertebrae[1]. The transverse foramen is a unique feature of transverse process of cervical vertebra which is not found in any other vertebra. Therefore, there is one transverse foramen on each side of the vertebra. The transverse foramen transmits the vertebral artery and sympathetic plexus surrounding the vertebral artery as well as the vertebral nerve, a branch from the cervicothoracic ganglion. The aim of this research is to analyse extra foramen and its clinical importance.

## MATERIALS AND METHODS :

52 cervical vertebra of both the sex from various dental and medical colleges were investigated to find the presence of accessory foramen transversarium. The number of accessory foramen present on each vertebra is analysed.

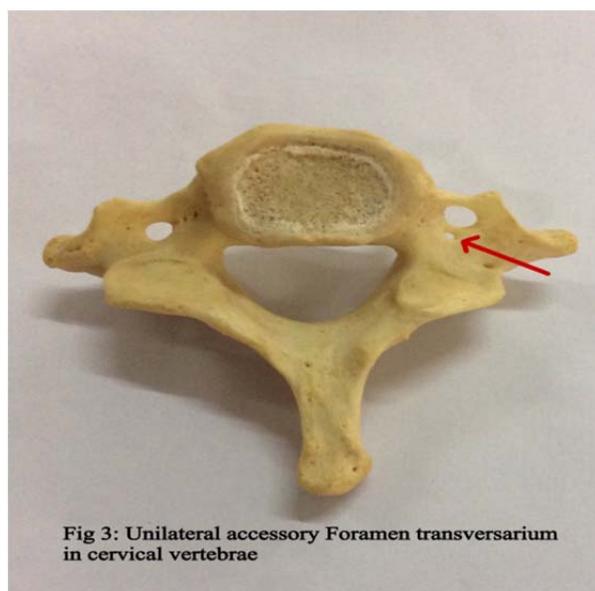
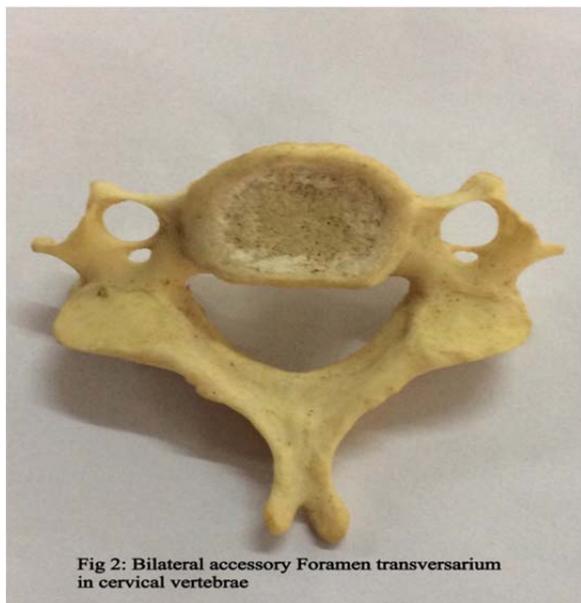
## OBSERVATION :



Fig 1: Foramen transversarium in cervical vertebrae

All 52 vertebrae which were studied show the presence of foramen transversarium in the transverse process as the characteristic feature of cervical vertebra. Out of all 11(21.15%) vertebra shows the presence of accessory foramen in the posterior arch. When they studied detailed, about 5 had it bilaterally in which 4 were in left transverse process and 2 were in right transverse process only(unilateral).

Total Number of cervical vertebra examined	Vertebra with unilateral accessory foramen transversarium		Vertebra with bilateral accessory foramen transversaria	Number of vertebra with accessory foramen transversaria	% of incidence
	Left	Right			
52	4	2	5	11	21.15%



#### DISCUSSION :

The surgical anatomy of variations in the foramen is important for neurosurgeons and radiologists to interpret the computed tomography and magnetic resonance imaging scans. These variations are clinically important as vertebral artery passes through it and presence of accessory foramen transversarium could mean variations in the course of vertebral artery[2].

In our study out of 52 dry cervical vertebra, 11(21.15%) shows the incidence of accessory foramen transversarium. Out of that, 5 were bilateral in nature and 6 were unilateral with 4 on the left and 2 on the right transverse process. Archana Sharma et al reported 8%(16) of incidence in 200 cervical vertebrae. Out of 16, 9 were bilateral and 7 were unilateral in nature[3]. Pushpa potaliya et al reported 13.33%(16) of incidence in 120 atlas vertebrae with bilaterally 6 and unilaterally 10 foramen[4]. Pretty Rathnakar et al reported 5.7%(8) of incidence in 140 cervical vertebrae[2]. Taitz et al. reported the incidence of 7%(34) among the 480 vertebrae they studied[5]. Das Srijit et al reported 1.5% incidence in 132 cervical vertebra[6]. Lakshmi Chandravadiya et al reported 4.76%(10) of incidence in 210 cervical vertebra, among them 8 were unilateral and 2 were bilateral. El Shaarawy reported that the accessory foramen transversarium is most common in lower vertebrae(C5,C6,C7), especially in C6[8]. Murlimanju B.V et al reported unilateral presence is more common than bilateral[9]. Among the other, our study has reported the higher percentage(21.15%) incidence of foramen transversaria.

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