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Accessory Foramen Transeversarium in Cervical Vertebrae-A Case Study

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ABSTRACT

The cervical vertebrae presents foramen transversariumm in each transverse process, except in the seventh cervical vertebra rest of the foramen transversarium normally transmits vertebral artery and vein and a branch from the cervicothoracic ganglion.25 sets of cervical vertebrae were studied . Variations were noticed in the number of foramen transversarium unilaterally and bilaterally.The cause of variations in foramen transversarium may be developmental or due to the variation in course of the structures passing through it.

KEYWORDS : Accessory foramen, Foramen transversaria, cervical vertebra, vertebral artery

Introduction:

Foramen transeversarium is a specific feature of the cervical vertebrae which differentiates it from the thoracic and the lumbar vertebrae. It is formed by the vestigial costal element fused to the body and the true transverse process of the vertebra. The vertebral vessels and nervous plexus are passing between these two bony parts. The foramen transversarium is closed laterally by the costotransverse bar, a thin plate of bone connecting the rib element to the original transverse process.(1)

The present study has important clinical implications for head and neck and vascular surgeons and radiologists.

Materials and Methods:

25 sets(175 no) of cervical vertebrae, both typical and atypical were studied in the Department of Anatomy, Kalinga Institute Of Medical Sciences. Presence of accessory foramen both unilaterally and bilaterally were observed with the naked eye.

Results:-

VERTEBRA	BILATERAL	UNILATERAL RIGHT	UNILATERAL LEFT
TYPICAL(C3-C6)	10	6	3
ATLAS(C1)	3	2	0
AXIS(C2)	1	0	0
C7	4	2	7

INCIDENCE:-

In the current study incidence of accessory foramen transversarium is as follows

Typical vertebrae (C3-C6) out of 25sets of typical cervical vertebra (100):-

Bilateral:-10%
Unilateral right :-6%
Unilateral left :- 3 %

Atlas(C1) out of 25 Atlas:- bilateral:-12%
Unilateral right:-8%
Unilateral left:-0%

Axis(C2) out of 25 Axis:- bilateral:- 4%

Unilateral(right & left):-0%
C7 vertebra:- bilateral:-16%
Unilateral right:- 8%
Unilateral left:-28%

Discussion:

Foramen transversarium transmits vertebral artery and vein in all cervical vertebrae except seventh. Foramen transeversarium is divided by a fibrous or bony bridge into a larger anterior and smaller posterior part,which is known as accessory foramen transeversarium.

Since the vertebral vessels are responsible for the formation of the foramen transversarium, it can be assumed that variations in the course of the vertebral vessels will cause variation in foramen transversarium vice versa variations of the foramen transversarium can be useful in estimating the variations of the vessels. An absence of foramen transversarium could mean absence of the vertebral artery or the artery running along the transverse process and not through the foramen transversarium. A narrowing of the foramina may indicate narrowness of the vessels.Double foramen transversaria could mean duplicate vertebral arteries .The accessory foramina may be present to compartmentalise the contents of foramen transversarium.(2)

In the present study we found 10% typical vertebrae having accessory foramen transversaria bilaterally, 6% unilaterally on right and 3% on left side.Among the atypical vertebrae we found C7 having the highest incidence of both bilateral and unilateral foramen transeversaria.

A study reported 16 vertebrae having accessory foramen transversarium out of 200 cervical vertebrae (3).

.A study of 132 vertebrae reported double foramen transversaria unilaterally and bilaterally in only 2 cervical vertebrae (4).

Jarostaw et al reported accessory foramina most common at the level of C6.(5)

A study observed accessory foramen transversarium in 1.6% of the cases ,unilateral being more common than bilateral.(6)

El Shaarawy et al. observed that the accessory foramina transversaria were most common at the lower cervical vertebrae (C5, C6 and C7), mostly in C6.(7)

Double foramen transversarium may be correlated by duplication of vertebral arteries.Duplication means a vessel has a two origin that follows a more or less parallel course for a variable distance.(8)

Conclusion

In most of the previous studies they have found the accessory foramen transeversaria are more common in typical(C6) vertebra.But in the present study we found the accessory foramen are most common in C7 vertebra.

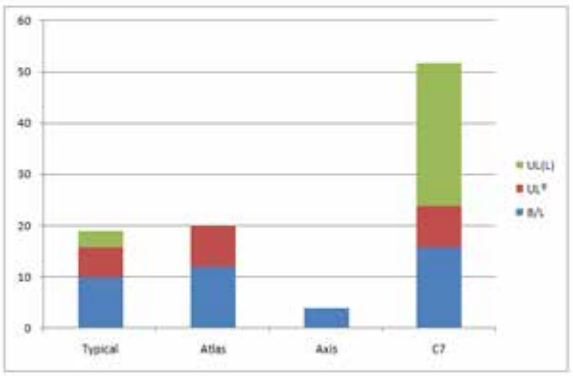
Figure 1- Showing atlas with AFT(Accessory foramen transversarium).

Figure 2-Showing axis vertebra with bilateral AFT(accessory foramen transversarium).

Figure 3-Showing typical cervical vertebra with bilateral AFT(accessory foramen transversarium).

Figure 4- Showing 7th cervical vertebra with AFT(Accessory foramen transeversarium).

Figure 5- Showing 7th cervical vertebra with AFT(Accessory foramen transeversarium).



Graph showing the incidence of accessory foramen in typical and atypical cervical vertebrae.

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