DOUBLE FORAMEN TRANSVERSARIUM IN CERVICAL VERTEBRA AN OSTEOLOGICAL STUDY

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Abstract:
50 sets of typical dried cervical vertebrae of human were studied for no. of foramen transversarium present on each transverse process of vertebra. So double foramen transversarium were detected unilaterally or bilaterally in 16 vertebrae out of 200 typical (C3-C6) cervical vertebrae. The variation of foramina appears to follow a pattern at various vertebral level.The course of vertebral artery may be distorted under such conditions. The normal factor responsible for such anomalies of foramen transversarium is developmental or related to the variation of course of vertebral artery.

Key Words : Foramen transversarium, cervical vertebra.

INTRODUCTION

Foramen transversarium is a specific feature which is present in the transverse process of cervical vertebrae. The transverse process of adult anatomy is morphologically a compound structure containing the foramen transversarium. It displays anterior and posterior roots or bars which terminate laterally as anterior and posterior tubercles. The roots are connected lateral to the foramen by an intertuberculas lamella of bone known as the costotransverse bar[1]. In all cervical vertebrae except 7th , the foramen transversarium transmits vertebral artery, vein and sympathetic fibers from inferior cervical ganglion. In additions. the cervical skeleton is also a bony frame work for the vertebral arteries in their course from the aortic arch to the cranial fossa. As a result of the large no. of tasks performed by this part of skeleton, any disorder affecting it may lead to significant lowering the quality of life[2,3].

MATERIAL & METHOD

50 sets or 200 dried typical vertebrae of human of both sexes were taken for study of duplication of foramen transversarium. No.of foramen present on both transverse process of each vertebra was noted. The comparison was made for double foramen transversarium in C3- C6, vertebrae.

OBSERVATION

Out of 200 cervical vertebra 16 vertebrae were found to have double foramen transversarium unilaterally or

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Type of vertebrae	*No. of vertebrae examined*	*Vertebra with unilateral accessory FT*	*Vertebra with bilateral accessory FT*	*Total no. of vertebra with accessory FT*	*Incidence in%*
C_3	50	1	-	1	2%
C_4	50	2	1	3	6%
C_5	50	1	3	4	8%
C_6	50	3	5	8	16%

Fig-1 C4 Vertebra showing bilateral accessory foramen

Fig-2 C5 Vertebra showing bilateral accessory foramen

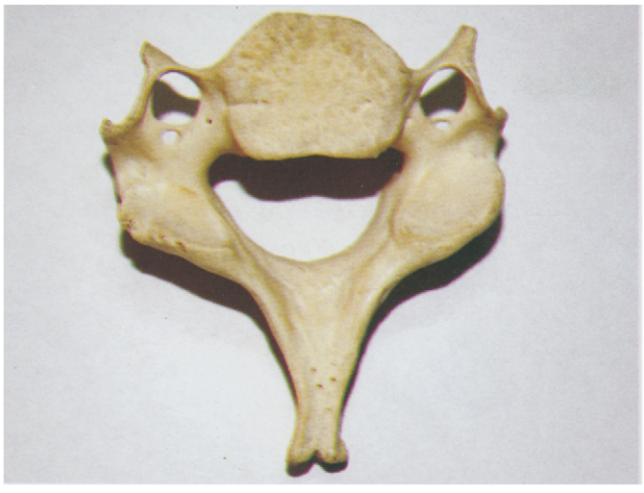

Fig-3 C6 Vertebra showing bilateral accessory foramen

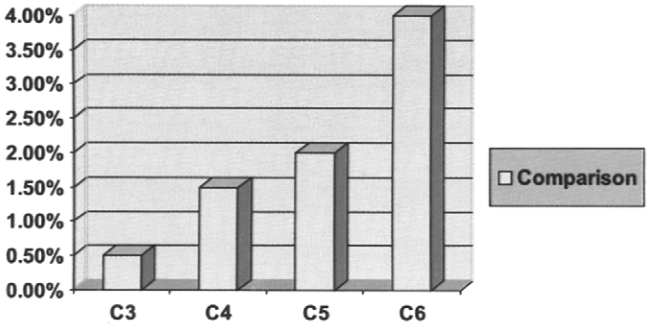

Fig-4 Percentage of incidence of accessory foramen transversarium in typical cervical vertebra

DISCUSSION

In our study out of 200 typical vertebrae 16 vertebrae were showing accessory foramen. In comparison to C3- C5 vertebrae C6 was showing more incidence. Total 8% incidence was noted out of which C3 (.5%), C4 (1.5%), C5 (2%), C6 (4%).

Das srijit(2005) reported two cases of double foramen transversarium in132 human cervical vertebra.C Taitz et. Al(1978) studied 36 spines and reported 34 vertebrae which were having double FT.Jaroslaw Wysocki et al studied 100vertebral columns and reported devided foramen most frequent at the level of C6(45.6%)and rarest at the level ofC3(2.8%).Accessory FT were reported in lower cervical vertebra mostly in C6(70%)[7].Abnormal foramina on the posterior arch of atlas vertebra was reported by Satheesha Nayak B.(2008)[8].

Anatomically,the foramen transversarium is described to be divided by a fibrous or bony bridge,separating the artery and the vein[9],the smaller posterior part(that encloses a branch of vertebral nerve and the vertebral vein) is called accessory vertebral foramen[10]. The vertebral nerve ascends from the stellate ganglion up to the level of C3,two branches from this nerve are formed running towards the sixth spinal nerve, and one of the these branches passes through the accessory foramen[10].So our study showed that FT more common in lower cervical vertebra mostly in C6.

Double foramen transversarium may be correlated by duplicate vertebral artery.Bifid or duplicate origin and fenestration of the vertebral artery have been reported[11].Duplication implies that a vessel has two origin that follows a more or less parellal course for a variable distance.Duplicated VAS are rare anomalies,found in less than1% of anatomic dissections[12]

RESULT

Out of 200 typical vertebrae 16 vertebrae were found to have accessory vertebral foramen unilaterally or bilaterally. Incidence of double foramen transversarium is more in C6 than other typical vertebea.

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