

Bilateral absence of foramen transversarium in atlas vertebra: a case report

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ABSTRACT

Atlas is the first cervical vertebra. It does not have a body like other cervical vertebrae. It has two transverse processes, each one of which bears a foramen transversarium. The vertebral artery passes through this foramen. We noticed a bilateral absence of foramen transversarium in an atlas vertebra during osteology demonstration classes. The knowledge of this variation may be of importance during the interventions to that area and also of interest for anthropologists. *Neuroanatomy*; 2007; 6: 28–29.

Key words [atlas vertebra] [transverse process] [foramen transversarium] [cervical vertebra] [vertebra]

Introduction

Atlas is the first cervical vertebra. It is ring shaped, without a body. It has an anterior arch, a posterior arch and two lateral masses. The lateral masses articulate with the occipital condyles to form an ellipsoid type of synovial joint. The anterior arch articulates with the dens of the axis to form a pivot type of synovial joint. The posterior arch is grooved by the third part of the vertebral artery. The transverse process has a foramen transversarium where passes the vertebral artery.

Case Report

During the osteology demonstration classes for undergraduate medical students, we noticed the absence of foramen transversarium bilaterally in an atlas vertebra (Figures 1 and 2). Each transverse process was 2 cm in length and resembled the transverse process of thoracic vertebra in shape. A small pleurapophysis tubercle was projecting laterally from anterior part of the lateral mass. Though the foramen transversarium was absent, the groove for vertebral artery was present on the posterior arch. Apart from absence of foramen transversarium, there were no other abnormalities in the bone.

Discussion

The reported variations of atlas include partial or total fusion of atlas vertebra with the occipital bone [1]. In a recent study, atlas showed the greatest variability among the cervical vertebrae. The variations recorded in this study include the split superior articular process (47.8%),

split posterior (3%) or anterior (1%) arches, and the presence of some accessory bony arches embracing the vertebral artery [2]. Absence of foramen transversarium in atlas is a very rare variation. Absence of foramen transversarium unilaterally, on the left side has been reported [3]. In our case however, the groove for vertebral artery was present on the posterior arch.

The transverse process of atlas is an important landmark for head and neck surgeons [4]. Lateral to the transverse process, sits the posterior belly of the digastric muscle, the stylohyoid muscle, and the occipital artery. Anterior to the transverse process, the styloid process can be exposed. The internal jugular vein and cranial nerves X, XI, and XII sit between the styloid process and the transverse process of atlas. Superior to the transverse process, tracing the carotid sheath upward, the carotid canal and jugular foramen can be reached. Antero-inferior to the jugular foramen, the hypoglossal nerve emerges from the cranial cavity through the hypoglossal canal. Posterior to the transverse process, the suboccipital triangle can be recognized.

In cases of bilateral absence of the foramen transversarium, there may be confusions in reaching these structures. Bilateral absence of the foramen transversarium in atlas has not been reported yet. Hence it is noteworthy for various disciplines like neurosurgery, orthopedic surgery, radiology and anthropology.



Figure 1. Anterosuperior view of the atlas vertebra. Color version of figure is available online. (AA: anterior arch; PA: posterior arch; T: transverse process; P: pleurapophysis)



Figure 2. Superior view of the atlas vertebra. Color version of figure is available online. (AA: anterior arch; PA: posterior arch; T: transverse process)

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