

Anomalous Origin of Left Vertebral Artery from Ascending Aorta in a Case of Tetralogy of Fallot: A Rare Case Report

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Abstract

Aberrant origin of vertebral artery is rare. Anomalous origin of left vertebral artery from ascending aorta has never been described in literature. We present a 3 year old child of tetralogy of fallot with aberrant origin of left vertebral artery from ascending aorta.

Keywords: Vertebral artery anomaly; Ascending aorta

Introduction

The vertebral arteries arise from the superoposterior aspect of the first part of subclavian artery. The vessel takes a vertical posterior course to enter into the foramen transversarium of sixth cervical vertebra. The segment of the artery from its origin at subclavian artery to its respective transverse foramen is called the pretransverse or prevertebral segment. In our case, the prevertebral segment originated directly from the ascending aorta (Figure 1B). Unfortunately the entry point of the vertebral artery into the cervical vertebrae could not be visualized in the angiography. An anatomical knowledge of anomalous origin of vertebral artery is of utmost importance in surgery, angiography and all non-invasive procedures to prevent inadvertent complications [1].

Case Presentation

A 3 year old child was brought with complaints of easy fatigability and cyanosis. 2 dimensional echocardiography revealed the diagnosis of tetralogy of fallot. Patient underwent cardiac catheterization and angiography to plan for surgical repair. Aortic root angiography revealed an anomalous vessel (left vertebral artery) arising from ascending aorta (Figure 1A) and coursing along left subclavian artery to enter the cervical vertebra.

Discussion

Although the VA is usually the first branch of the subclavian artery, several variations in the origin of this vessel have been reported in the literature. Anomalies of the left VA originating from the aortic arch are reported to be 2.4–5.8% in several large autopsy series [2]. The vertebral artery is formed between 32nd and 40th day of gestation. The first part of vertebral artery develops from proximal part of dorsal branch of seventh cervical intersegmental artery proximal to post costal anastomosis. The second part is derived from longitudinal communications of the post costal anastomosis with the consequent regression of the stems of the upper six intersegmental arteries. Third part develops from spinal branch of the first cervical intersegmental artery. Fourth part owes

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Received Date: 30 Mar 2018

Accepted Date: 08 May 2018

Published Date: 11 May 2018

Citation: Hamsini BC, Gowda D. Anomalous Origin of Left Vertebral Artery from Ascending Aorta in a Case of Tetralogy of Fallot: A Rare Case Report. *J Surg Forecast.* 2018; 1(2): 1014.

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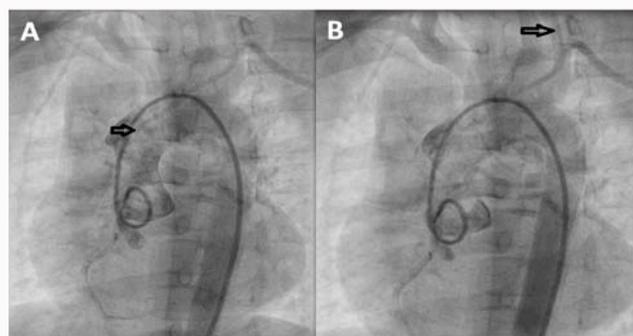


Figure 1: Catheter angiography showing origin of left vertebral artery from posterior part of ascending aorta (A) and its pre vertebral segment (B).

its development from the pre neural division of the spinal branch [3]. Any abnormalities in the fusion process leads to abnormal origins [3]. In the present study, in left side, the left sixth dorsal intersegmental artery might have originated from the ascending aorta. Origin of left vertebral artery from ascending aorta is at higher risk of dissection/aneurysm formation [4]. According to Vorster et al, 1998, the proximal parts of the segmental arteries are exposed to longitudinal tension and bending due to caudal shifting of the aorta resulting in retarded blood flow and abnormal connections between longitudinal channels (vertebral artery) and subclavian artery or aorta [5].

Yuan et al [6] reviewed 1286 cases of aberrant origin of vertebral artery and have described one case of origin of right vertebral artery from ascending aorta. To the best of our knowledge, left vertebral artery arising from ascending aorta in a case of tetralogy of fallot is the first of its kind in the literature [7].

Conclusion

The knowledge of origin of vertebral artery is necessary and beneficial for planning aortic arch surgery or endovascular interventions. This is the first case of anomalous origin of left vertebral artery from ascending aorta.

Informed Consent

Written informed consent was taken from hospital ethical committee and patient s parents before publishing the paper.

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