SHORT REPORT

Compression of the Left Innominated Vein between the Brachiocephalic Trunk and Left Carotid Artery


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KEYWORDS
Left brachiocephalic vein; Anatomical anomaly; Innominated venous left trunk compression

Abstract
We present a case of a 25-year-old male who looked for medical attention for symptoms like dysesthesias in his left arm. Physical examination revealed severe dilations of the superficial veins in his left forearm and arm.

An ultrasound showed no signs of thrombosis. Dynamic phlebography ruled out the presence of extrinsic compression of the left innominated vein. The angioMRI confirmed that the innominated vein was compressed between the brachiocephalic trunk and left carotid.

Therefore, we describe a previously unreported congenital anomaly of the left brachiocephalic vein where the fundamental symptom is the compression of the left innominated trunk.

Introduction

The true prevalence of anatomic anomalies of the left brachiocephalic vein is unknown, but is supposedly infrequent. Normally the left innominated vein runs anterior to the left carotid artery and brachiocephalic artery. The most commonly reported anomaly is the left retroaortic brachiocephalic vein in which the vein crosses underneath the aortic arch. Different types of retroaortic brachiocephalic vein are described depending on its anatomical relation to the ductus. They are usually associated with congenital cardiac malformations such as tetralogy of Fallot. They are also associated with aortic arch anomalies.

Case Report

We present a case of a 25-year-old male, right handed, who presented with superficial dilatation of the veins in his forearm present since early childhood. He referred mild pain and non-specific symptoms such as dysesthesias in his forearm, where the dilated veins were more visible. The pain diminished with arm elevation. None of the symptoms were disabling.

Physical examination revealed severe engorgement and hypertrophy of the upper and fore left arm veins with no drainage following arm elevation. No other physical findings such as oedema, or deep vein thrombosis were present.

An ultrasound and phlebography of the humeral, axillary and subclavian veins were free of thrombosis. Dynamic phlebography revealed extrinsic compression of the left innominated vein with prominent collateral circulation (Fig. 1). The left brachiocephalic vein drained directly into the right jugular vein through hypertrophic collaterals.
A thoracic CT scan was performed, which ruled out the presence of any expansive mediastinal process as a cause for extrinsic compression. An angioMRI 3D confirmed the innominate vein was compressed between the braquocephalic trunk and left carotid (Fig. 2). Prominent collateral circulation of the anterior jugular arch was also demonstrated. No congenital cardiac malformations were observed by echocardiogram.

Once diagnosis was obtained treatment options such as open surgery with reconstruction of the anatomic anomaly, endovascular surgery, new isolated phlebectomies or observational treatment, were discussed. We opted for conservative management. We believe open surgery would be a very aggressive treatment option and endovascular therapy with angioplasty or stenting of the left innominate vein would increase the patients’ risk of vein thrombosis mid and long-term.

Discussion

Aberrant or retroaortic left braquocephalic vein is usually associated with congenital heart defects including those affecting the aortic arch. If it is not associated with other malformations it is usually asymptomatic.

In the case we describe, the rare malformation of the left innominate vein has not been recorded in the literature, and is not associated with other congenital pathologies despite being quite symptomatic.

Symptomatic compression of the innominate trunk was first described by Wurtz et al., who named it “innominate vein compression syndrome”. The case was a 65-year-old female with superior left vena cava syndrome caused by the compression during expiration of an anatomically normal innominate left vein caused by an also anatomically normal left subclavian artery.

Our case, however, is radically different. The patient consulted about varicose dilations predominantly on his left forearm and arm. These symptoms are probably due to the fact this is a chronic process which has been progressively compensated with new collateral veins from the right internal jugular vein.

By contrast, as described in Chern et al.’s work, an anatomic anomaly of a left braquocephalic vein is usually asymptomatic. Chern et al. report 14 cases of retroaortic brachiocephalic vein. Likewise, Yama et al. describe a polytraumatic patient who was believed to have the same anomaly following a simple chest X-ray examination showing enlargement of the mediastinum.

This is therefore, to the best of our knowledge, the first report of an anatomic variation of the left innominate vein following an abnormal course behind the arterial brachiocephalic trunk and beneath the left common carotid artery. This anomaly produces compression of the venous system in the left upper extremity.

Open or endovascular surgery was not deemed ideal therapeutic options because of their invasiveness and considerable complication rates, and also because the patients’ symptoms were mild and non-specific.

We conclude that we present a previously unreported congenital anomaly of the left brachiocephalic vein where the fundamental symptom is the compression of the left innominate trunk.

Conflict of Interest/Funding

None.

References