Isolated retroaortic left innominate vein in an adult without cardiac or aortic anomalies

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Abstract
Retroaortic innominate vein is an uncommon variant reported in patients with congenital heart disease. However, isolated retroaortic innominate vein without associated cardiac or arch anomalies is extremely rare. We present a case of a 68-year-old man who was found to have this anomalous variant incidentally on computed tomography (CT) of the thorax. We also briefly discuss its associations, embryology, and clinical significance.

Key words: Anomalous left innominate vein; embryology; imaging

Introduction
The left innominate vein usually courses anterior or anterosuperior to the aortic arch to join the right innominate vein, forming the superior vena cava (SVC). However, retroaortic course is reported in around 0.2-1% of patients with congenital cardiac anomalies such as Tetralogy of Fallot and right ventricular outflow obstruction.[1,2]

Also, 80% of cases with this anomaly have cardiac anomalies. Isolated retroaortic innominate vein in situs solitus without cardiac or aortic anomalies is extremely rare with very few reports in literature.

Case Report
A 68-year-old man was recovering from bacterial pneumonia involving both lungs. Patient had loss of weight and appetite. He did not have any heart disease. His clinical examination was unremarkable. No significant cardiac abnormality was noted on auscultation and in electrocardiography. However, his blood levels showed persistently high eosinophil count. Chest radiograph was unremarkable except for resolving pneumonia. Contrast-enhanced computed tomography (CT) scan of thorax, abdomen, and pelvis was done in dual-energy CT scanner (SOMATOM Definition Flash, Siemens Healthcare, Erlangen, Germany) to rule out any underlying neoplasm. No definite mass was noted in the CT. Incidentally, the left innominate vein had an abnormal course [Figure 1] behind the ascending aorta before joining the right innominate vein to form the SVC which was normal in position (on the right side). The volume-rendered three-dimensional images obtained by dual-energy based bone removal clearly showed the relationship with the aortic arch [Figure 2]. The arch of aorta was left-sided. Heart was normal in CT scan. The anomalous course of the retroaortic innominate vein was highlighted in the report because of its clinical implications.

Discussion
Retroaortic innominate or brachiocephalic vein is an uncommon variant, first described 125 years ago by Kershner.[3] It is usually reported in patients with congenital heart diseases,[2,4] with a reported incidence of 0.2-1%. [1,4,5] Common association is Tetralogy of Fallot with right aortic
The anomalous retroaortic innominate vein has certain clinical implications,[4,5] and hence, needs to be highlighted if incidentally detected. On non-contrast axial CT sections, this variant may mimic an enlarged lymph node, although it is easy to appreciate in multiplanar projections. Difficulty may be encountered during insertion of central venous catheter through left jugular or subclavian approach. This variant may also cause difficulties during cardiothoracic surgeries.[4,5] If the surgeon is not aware before surgery, this can be mistaken for absent left brachiocephalic vein after sternotomy. During cardiopulmonary bypass, the cannulation of SVC has to be done more caudally as the anomalous vein enters the vena cava more inferior than usual. During surgeries for congenital abnormalities, anomalous innominate vein may obscure the surgical field, causing difficulties in visualization of pulmonary arteries.

In conclusion, although extremely rare in isolation, recognition of anomalous left brachiocephalic vein is important for the treating physician before planning any intervention or surgery.

References


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