

TEACHING FILES (GRAND ROUNDS)

ABERRANT VASCULATURE IN THE LIVER

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Clinical Problem:

A 2-month-old female infant presented for a secondary assessment following the identification of abnormal vessels during antenatal ultrasound. Subsequent imaging via CT abdomen at 1 month of age revealed the presence of aberrant vessels originating from the portal vein, which supplied the right lobe of liver segment VII. This particular liver segment exhibited heightened blood perfusion compared to the remaining liver tissue. Despite these findings, the child remained clinically asymptomatic, exhibiting no hepatosplenomegaly and displaying normal growth patterns. Comprehensive assessments including liver function tests (LFTs) and hemogram yielded normal results.

*How common are aberrant vasculature in the liver?
How should this child be managed?*

Discussion:

During embryonic development, the liver receives blood from the portal vein, umbilical vein and hepatic artery and drains through the hepatic veins.¹ Vascular malformations affecting these vessels can occur congenitally or as a result of infection, trauma, systemic disorders or medical interventions.² Anatomical differences in the portal vein are quite frequent. The most commonly observed variant pattern is portal vein trifurcation, where the main portal vein divides into three branches: the right anterior portal vein, right posterior portal vein and left portal vein which is found in approximately 7% of the population. The next involves the main portal vein branching first into the right posterior branch, followed by the right anterior and left portal veins, which is seen in around 5% of individuals. Others include quadrifurcation of the portal vein and the origin of the segment VIII or segment IV branch directly from the main portal vein.² Hepatic arterial anomalies encompass substituted Right hepatic artery in 11-21% and replaced Left hepatic artery in 3.8-10%. Accessory RHAs and LHAs occur at 0.8-8%.³ Right Hepatic vein exhibits the most extensive drainage area and diverse anatomical

anomalies. Additional variations involve extra hepatic veins, retrocaval hepatic veins and deficient or underdeveloped ones.⁴

A remarkable link has been established regarding the presence of aberrant blood vessels in livers affected by idiopathic portal hypertension. These blood vessels exhibit thin walls and are found in close proximity to portal tracts or within the hepatic lobules.⁵ This connection emphasizes the significance of monitoring patients for signs of portal hypertension. Hence, for this child, a conservative management approach was adopted with vigilant surveillance for symptoms such as bleeding varices, splenomegaly or ascites during follow-up.⁶

Compliance with ethical standards

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Conflict of Interest: None

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