



Threads and Streaks Sign

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A 65-year-old man visited our hospital with the complaint of diffuse pain in the upper abdomen for 2 months with no associated vomiting, melena, or weight loss. Serum AFP (alpha fetoprotein) levels were elevated (1400 ng/mL). Ultrasonography was done subsequently for the patient, which showed a cirrhotic appearance of the liver with diffusely infiltrative mass lesion was seen in bilateral lobes of the liver extending within the left and the right portal vein with prominent arterial supply on color doppler images (Figure 1A). A subsequent contrast-enhanced ultrasonography (CE-US) was performed to characterize the lesion, which showed the characteristic “threads and streaks sign”, also known as “striated vascular sign”, which was earlier classically described on angiography¹ for hepatocellular carcinoma.

Threads and streaks sign is the specific appearance of multiple tortuous arterial collaterals supplying the tumoral thrombus forming arteriportal shunts, which directly drain into the portal vein leading to early “chain-like” filling of the portal vein in the arterial phase. Multiple small and thin blood spaces which develop inside as well as between the tumor and vessel wall are responsible for this appearance. The presence of this sign indicates the growth of the tumor within the vessels, especially in cases with hepatocellular carcinoma.² We demonstrated this sign on CE-US (Figure 1B), which helped us clinch the diagnosis of hepatocellular carcinoma on ultrasonography. On subsequent triple phase computed tomography (CT) this appearance was replicated (Figure 1C) hence confirming the findings.

Hepatocellular carcinomas are hypervascular tumors with predominant arterial supply, which is often evident on multiphase contrast CT/magnetic resonance imaging (MRI).³ Arteriportal shunting is one of the most characteristic findings in these tumors, and it is correlated with the histopathological grade of the tumor as these shunts are seen more in well-differentiated tumors.⁴ Multiple antemortem and postmortem studies by Okuda and colleagues⁵ suggest the involvement of the inferior vena cava and the hepatic veins should be sought in patients with hepatocellular carcinoma when the thread and streak sign is visible at either angiography or contrast-enhanced (CE-CT). We were able to demonstrate this sign on CE-US, and hence its utility in patients with

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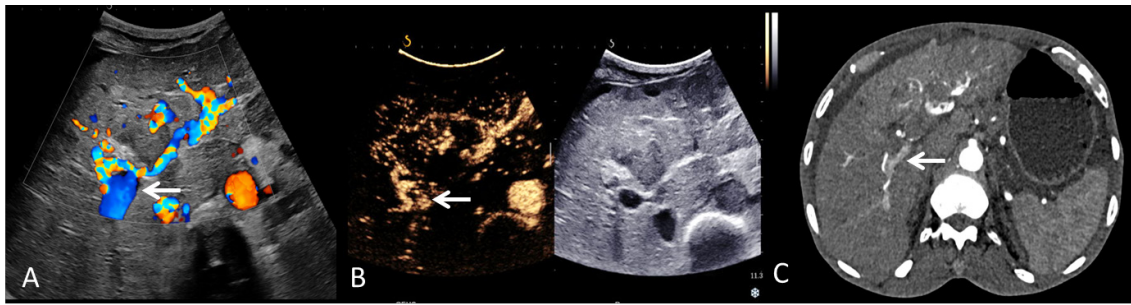


Figure 1. 65-year-old male with raised AFP: Threads and streaks sign (A) Colour Doppler ultrasound images show tumor extending into the portal vein (white arrow), (B) Comparative contrast-enhanced ultrasonography and grayscale images show contrast within the portal vein in the early arterial phase (white arrow), (C) Axial arterial phase contrast-enhanced images show multiple small arterial collaterals within the tumor thrombus with early draining right portal vein (white arrow).

a suspected liver lesion in patients with renal failure, and the non-availability of modalities like CT/MRI to diagnose hepatocellular carcinoma is emphasized.

This appearance, however, needs to be differentiated with a bland thrombus of the portal vein, which shows no arterial phase enhancement and arterioportal shunting, as well as other causes of arteriovenous shunts like regenerating liver in liver cirrhosis. Another limitation while evaluating this sign is that a similar appearance can also occur in other hypervascular tumors that might grow into a portal vein and develop arteriovenous shunting.

Ethical Approval

Written informed consent was obtained from the patient for publication of this report.

Conflict of Interest

The authors declare no conflict of interest in this work.

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