CASE REPORT

Diagnosis of double splenic artery pseudoaneurysm: CT scan versus angiography

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SUMMARY

The formation of splenic artery pseudoaneurysms is a commonly reported complication of chronic pancreatitis. Angiography has an established role in the diagnosis of splenic artery pseudoaneurysms while CT scan is thought to be less accurate for making this diagnosis. In this report, we present a rare case of two separate concomitant splenic artery pseudoaneurysms, illustrating the value of combining CT and angiography for optimal visualisation and treatment.

BACKGROUND

Formation of pseudoaneurysms (PAs) is one of the commonly reported complications of chronic pancreatitis. Erosion of the pancreatic enzymes into the adjacent vessel walls may lead to arterial PA in 10–17% of patients with chronic pancreatitis.[1] Mortality approaches 100% if appropriate diagnosis is not made and the PA ruptures.[2] The risk of rupture of a splenic artery aneurysm increases significantly once its size exceeds 2 cm.[3] Irrespective of its size, however, a splenic artery PA should be managed immediately.[3 4] Thus, appropriate diagnosis is crucial. Direct catheter angiography has been assumed to be the standard for diagnosis.[5 6] In this case report, however, we present an unusual formation of two PAs along the splenic artery in the setting of chronic pancreatitis. One PA was not evident on CT scan at all, while quite identifiable on angiography. The other PA was clearly evident on CT scan while barely visible on angiography.

CASE PRESENTATION

A 73-year-old man who had undergone elective endoscopic retrograde cholangiopancreatography (ERCP) for common bile duct stones and jaundice, developed necrotising pancreatitis post-ERCP. The patient then developed a pseudocyst at the hilum of the spleen, which became infected and thus needed to be drained via a left retroperitoneal approach. The patient presented 3 months later with fever, bloody discharge from the drain and anaemia. The haemoglobin level was 8.2 g/dL on presentation and dropped to 3.6 g/dL within 3 h (normal 12–14 g/dL).

OUTCOME AND FOLLOW-UP

As part of his evaluation, the patient underwent abdominal CT scan, which revealed an almost totally thrombosed PA with patent splenic artery, measuring 4 cm×3.3 cm in the distal third of the splenic artery adjacent to the splenic hilum (figures 1 and 2).

Figure 1 Abdominal CT scan showing the distal splenic pseudoaneurysm (arrow).

The patient was scheduled to undergo angiography and embolisation of the PA. However, splenic artery angiography revealed the presence of another separate proximal PA 3 cm proximal to the first, measuring 2 cm×1 cm, with no obstructing lesion in the splenic artery. The previously identified distal hilar splenic artery PA on CT scan was not detected by angiography using the posteroanterior angulation. Since we were aware of the presence of another distal hilar splenic artery PA, the angulation was changed to 35° right anterior oblique (RAO) and 15° craniocaudal, and the hilar splenic artery PA was identified separately (figure 3).

A microcatheter was used to selectively catheterise the splenic artery. The tip of the catheter was

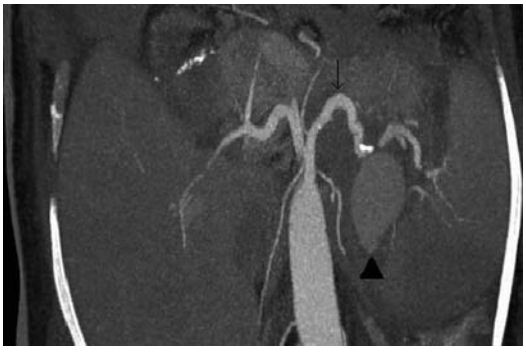

Figure 2 Maximal intensity projection oblique axial image that identifies the distal pseudoaneurysm (PA; arrowhead) and points to the presumed location of the other proximal PA (arrow).

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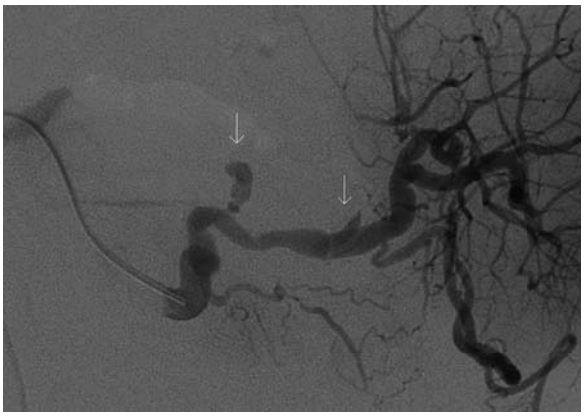

Figure 3 Angiography showing both the proximal and distal splenic pseudoaneurysms (arrows).

placed in the neck of the distal PA (figure 4). Multiple microcoils were deployed, which trapped the distal PA. Then, the catheter was withdrawn just distal to the proximal splenic artery PA where another angiogram confirmed the presence of the second PA, which was excluded by coiling the back door and front door.

Postembolisation angiography revealed complete occlusion of the two PAs. We documented uninterrupted blood flow and complete perfusion of the splenic parenchyma via collateral circulation (figure 5).

After angiography, we attempted to retrospectively review the patient's CT scan in order to identify the proximal splenic artery PA. This attempt, however, was unsuccessful despite our knowledge of the proximal PA's presence even after thoroughly searching in its presumed location identified by the angiography (figure 2).

DISCUSSION

Most patients with PAs are asymptomatic, which often results in diagnosis delays. Moreover, there exists discrepancy in the literature on which is the best method for diagnosing pancreatic PAs. While angiography has an established role in PA diagnosis,[5 6] in this case report we argue that the role of CT scan should not be underestimated, and hence both techniques could be very well complementary.

Angiography, the most commonly used technique for PA diagnosis, is reliable and should be used when tolerated by the patient. The high spatial resolution of digital subtraction angiography allows imaging of small vessels. It offers the benefit of treatment by transcatheter embolisation in appropriate patients.[7]

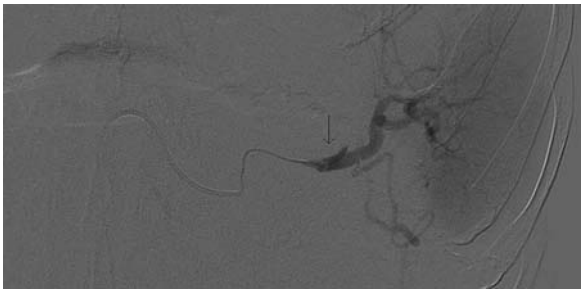

Figure 4 Angiography showing the tip of the catheter placed in the neck of the distal pseudoaneurysm (arrow).

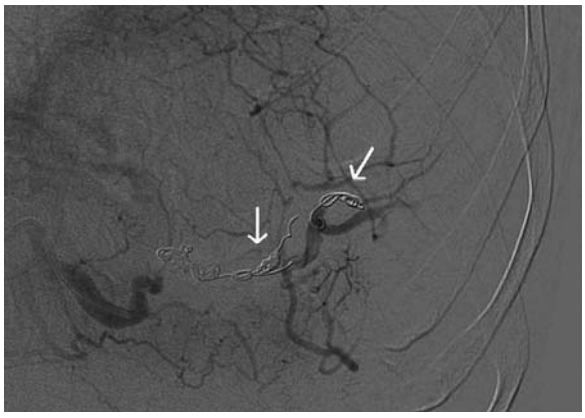

Figure 5 Angiography postembolisation showing the two coils (arrows) with no flow of blood in the two pseudoaneurysms nor in the splenic artery. Blood flow is preserved in the spleen bed.

In our patient, angiography enabled the detection and treatment of two PAs in the splenic artery. However, one PA was clearly more evident than the other. In fact, the less evident hilar splenic artery PA could have been missed due to its rare presentation (occurrence of two PAs concomitantly along the same artery), if we had seen no evidence of its presence on prior CT. Our prior knowledge of the presence of the other distal PA led us to adjust the angulation during angiography to better view the distal hilar splenic artery PA.

In our patient, CT imaging clearly identified the PA present in the distal third of the splenic artery but failed to identify the other proximal splenic artery PA.

The fact that angiography detected only one of the two PAs can be attributable to several factors. First, the occurrence of two PAs is very rare. Moreover, unlike CT, angiography is subject to an angulation limitation that impedes three-dimensional PA visualisation from all angles. This might have hindered the view of the other PA via angiography. The last point relates to the pressure by which the contrast was applied during angiography. Although it was able to allow contrast flow into the proximal PA, the pressure might have not been high enough to allow contrast flow into the distal one. Our findings highlight the importance of using multiple views (anteroposterior, RAO, left anterior oblique) in angiography.

On the other hand, the routine use of CT scan prior to angiography carries valuable diagnostic importance. We thus recommend that physicians obtain a CT scan prior to angiography. Based on the presentation above, however, the CT scan did miss the proximal splenic artery PA even on retrospective review. This could be explained by the difference in spatial resolution between the two modalities; angiography has a higher spatial resolution than that of a CT scan. At our institution, the spatial resolution of CT scan is 1.6 Lp/mm and that of angiography is 5 Lp/mm.

Finally, a physician must take other factors in consideration when using the two modalities, such as radiation exposure. The reported CT scan radiation exposure in the literature is 8.9 mSV,[8] whereas that of the diagnostic and therapeutic angiography is 18.9 and 26.9 mSV, respectively.[9]

The concomitant presence of two PAs, although rare, has been previously reported.[10] In the case reported in the literature, however, only after using two diagnostic modalities

(endoscopic ultrasound and contrast-enhanced transabdominal ultrasound and CT scan), were the two PAs identified.

Learning points

- CT scan and angiography are both valuable and complementary methods in confirming the radiological and clinical suspicion of arterial pseudoaneurysms.
- Angiography has a higher spatial resolution. However, CT scan is less invasive and involves lower radiation exposure.
- The combination of the two imaging modalities increases the accuracy of diagnosis and promotes better visualisation.

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Patient consent Obtained.

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