Self-expanding Stent Placement as a Bridge for Safe Hepatic Chemoembolization in a Patient with Isolated Spontaneous Dissection of the Celiac Artery

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Editor:

Isolated spontaneous dissection of the celiac axis is a rare condition that may cause abdominal pain (1). The diagnosis is made when other vascular anomalies or risk factors for dissection are ruled out. The management is commonly conservative; however, depending on clinical symptomatology, invasive treatment with surgery or transcatheter embolization have also been proposed. We present a case of spontaneous dissection of the celiac axis treated by self-expanding nitinol stent placement to allow future hepatic chemoembolization.

A 67-year-old female patient underwent enhanced abdominal computed tomography (CT) for evaluation of an ultrasonographically detected focal hepatic lesion in the setting of cirrhosis with markedly elevated α-fetoprotein level. CT disclosed a 1.4-cm asymptomatic aneurysm of the celiac artery with an associated intimal flap that smoothly narrowed the ostium of the common hepatic artery (**Figure, a**). Diagnosis of spontaneous celiac artery dissection was made, as the patient had no risk factors for arterial dissection. The left gastric artery arose from the false lumen (**Figure, b**) and the dissection extended from the celiac artery to the ostium of the hepatic artery. Ruling out other vessel involvement, serologic abnormalities, and trauma history, the diagnosis of isolated spontaneous dissection of the celiac axis was made. In addition, a diagnosis of hepatocellular carcinoma was made, and the patient presented several comorbidities that contraindicated surgery. We evaluated all the therapeutic options, and because the patient would potentially undergo repeated celiac artery cannulation for transcatheter hepatic chemoembolization, we decided to place a stent in an effort to collapse the false lumen to remove the risk of celiac artery rupture or occlusion during wire and catheter manipulations.

We chose a transaxillary approach to catheterize the celiac artery and deploy a self-expanding nitinol stent (Luminexx; Bard, Karlsruhe, Germany; 9 × 40 mm) through a 7-F long sheath, covering the celiac artery origin to the first portion of the hepatic artery. No abdominal symptoms were noticed regarding the fact that the left gastric artery arose from the false lumen of the dissection and, after the stent was placed into the true lumen of the dissection, there would be a possibility of compromised blood flow to this artery. In the 28 months after the procedure, the patient underwent four hepatic artery cannulations for regional chemotherapy (**Figure, c**). During this time period, serial follow-up CT scans confirmed stent patency without aneurysmal dilation and uncompromised flow in the hepatic and splenic arteries (**Figure, d**).

The radiologic diagnosis of isolated celiac artery dissection is established when an intimal flap with contrast enhancement within the false lumen (ie, "double barreled dissection") is seen on CT or angiography and other vascular lesions and risk factors are ruled out (2). Celiac artery dissection can also be secondary to blunt abdominal trauma or endovascular procedures.

Celiac dissection occurring during endovascular procedures can be managed by conservative therapy or fenestration with wires or a balloon; however, follow-up angiography in patients with iatrogenic celiac artery dissection

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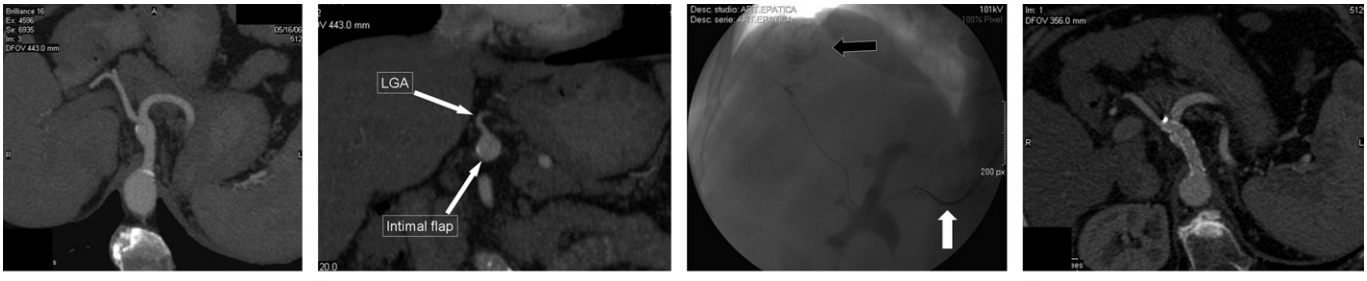

a. **b.** **c.** **d.**

Figure. **(a)** Contrast-enhanced axial CT scan shows a focal 1.4-cm celiac artery aneurysm with an intimal flap and a false lumen causing a smooth narrowing of the ostium of the common hepatic artery. **(b)** Coronal enhanced CT scan perpendicular to the celiac long axis shows the false and true lumen divided by the intimal flap and the left gastric artery (*LGA*) originating from the false lumen. **(c)** Angiogram shows regional transarterial chemotherapy infusion for hepatocellular carcinoma (black arrow) performed with a coaxial microcatheter inserted in a guiding catheter through the stent-implanted celiac artery (white arrow). **(d)** CT scan 28 months after celiac stent placement shows patency of the celiac artery.

reveals irregular or narrowed lumen in 40% of cases, pseudoaneurysm formation in 32.5%, and complete obstruction in 27.5% (3). In addition, in cases in which the dissection leads to a complete arterial occlusion, the potential to recanalize the vessel is low.

Although the dissection was not iatrogenic in the present case, the management of an oncologic patient who would need transcatheter hepatic chemoembolization or other regional infusion therapy as the only therapeutic or palliative option led us to perform celiac artery stent implantation to avoid the risk of celiac artery occlusion that would exclude the possibility of future transcatheter chemotherapies. We decided to use a self-expanding stent because we thought a balloon-expandable stent would be too rigid to adapt to the smooth tortuosity of the landing zone (ie, hepatic artery). We excluded the use of a stent-graft to avoid the risk of splenic and left gastric artery occlusion. We also did not consider balloon fenestration (as reported in cases of iatrogenic celiac dissection during hepatic infusional therapy) because, according to the angiographic/CT findings, the aneurysm appeared to be secondary to the dissection and the manipulation of a wire and catheter close to a pathologic wall could potentially cause rupture (4). In this case, stent placement was feasible and allowed several subsequent celiac axis cannulations.

References

1. Glehen O, Feugier P, Aleksic Y, et al. Spontaneous dissection of the celiac artery. Ann Vasc Surg 2001; 15:687–692.
2. D'Ambrosio N, Friedman B, Siegel D, et al. Spontaneous isolated dissection of the celiac artery: CT findings in adults. AJR Am J Roentgenol 2007; 188:W506–W511.
3. Yoon DY, Park JH, Chung JW, et al. Iatrogenic dissection of the celiac artery and its branches during transcatheter arterial embolization for hepatocellular carcinoma: outcome in 40 patients. Cardiovasc Intervent Radiol 1995; 18:16–19.
4. So YH, Chung JW, Park JH. Balloon fenestration of iatrogenic celiac artery dissection. J Vasc Interv Radiol 2003; 14:493–496.