Case report

Glue embolization of a ruptured celiac trunk pseudoaneurysm via the gastroduodenal artery

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Abstract. Percutaneous transcatheter embolization of splanchic artery aneurysms is a minimally invasive and alternative therapy to conventional surgical intervention. Due to a high-grade stenosis at the origin of the celiac trunk, a retrograde approach to the celiac trunk pseudoaneurysm via the gastroduodenal artery was necessary. To prevent undesirable embolization into the peripheral left gastric artery initial occlusion of the central portion of the left gastric artery was performed with microcoils using a Tracker catheter. Complete occlusion of the celiac trunk itself and the short adjacent segments of the celiac artery was achieved by using a mixture of N-butyl-2-cyanoacrylate and ethiodized oil as the embolizing agent.

Key words: Celiac trunk pseudoaneurysm – Embolization – Coaxial catheter technique – Tissue adhesive

Introduction

Splanchic artery aneurysms and pseudoaneurysms are rare vascular lesions. The etiological factors include arteriosclerosis, trauma, surgery, inflammation, collagen vascular disease, arteritis and congenital anomalies [1, 2].

Patients with celiac trunk aneurysms may be asymptomatic, in which case, the lesions are found incidentally. However, some patients experience abdominal pain due to aneurysmal growth or life-threatening bleeding due to aneurysmal rupture [3]. Thus, all pseudoaneurysms and true aneurysms over 2 cm in diameter [2, 4] have to be treated electively or even under emergency circumstances. Surgical clipping, in some cases with vessel bypass or reconstruction, and transluminal embolization are alternative therapeutic procedures.

Case report

A 56-year-old woman in bad general and nutritional condition was admitted to the Department of Surgery because of recurrent abdominal pain. Her past medical history included a primary biliary cirrhosis and an 11-kg loss of weight in the past year.

During the initial checkup a CT examination revealed a para-aortal lesion of 3 cm in diameter near the celiac trunk with unknown genesis. Before further examinations to clarify the nature of this lesion, the patient suffered from hemorrhagic shock and required cardiopulmonary resuscitation.

During emergency laparotomy an extensive retroperitoneal hematoma was found and drained; however, the source of the bleeding could not be established.

Because of clinical signs of recurrent bleeding 4 weeks after the first laparotomy, another acute CT examination was performed. It revealed a celiac trunk aneurysm surrounded by a recurrent hematoma. In addition, a large perirenal hematoma was found (Fig.1). At this time hematocrit was 23.9%, Hb was 7.6 g/dl, and red blood count was 2.6 T/l.

A second laparotomy was performed for surgical resection of the aneurysm.

This second laparotomy showed a partially organized hematoma around the aneurysm. Therefore, the surgical treatment of the aneurysm was thought to be too risky and the patient was transferred for transcatheter embolization.

Diagnostic angiography demonstrated a high-grade stenosis of the celiac trunk near the aortic ostium. Retrograde filling of the celiac artery via the gastroduodenal artery showed the partially thrombosed aneurysm (Fig.2).

Direct access to the aneurysm via the celiac trunk was technically impossible and necessitated a retrograde approach via the superior mesenteric artery, gastroduodenal, and common hepatic artery. This was performed with a coaxial system using a 3-F Tracker-18 catheter (Target Therapeutics, Fremont, Calif.) intro-
duced through a 6-F Simons-I catheter positioned in the superior mesenteric artery.

Prior to glue embolization we occluded the trunk of the left gastric artery by positioning three complex helical fibered platinum microcoils (Target Therapeutics, Fremont, Calif.) to prevent undesirable embolization of the left gastric artery (Fig. 3).

For embolization of the aneurysm with microcoils the catheter position was not stable enough because of the curved access route and the short celiac trunk. Therefore, the aneurysmal cavity and short segments of the adjacent afferent and efferent celiac artery were embolized with a mixture of N-butyl-2-cyanoacrylate (Histoacryl blue, B. Braun Melsungen, Germany) and ethiodized oil (Lipiodol Ultrafluide, Guerbet, Zurich, Switzerland) in a ratio of 1:3. To avoid polymerization within the catheter, the system was flushed with a 20% glucose solution before the embolization procedure and immediately thereafter. The mixture was applied under fluoroscopic control until stasis of the arterial blood flow was achieved.

Completion angiography after embolization showed a total occlusion of the aneurysmal cavity and the adjacent celiac artery but a regular retrograde filling of the left gastric artery by anastomotic branches originating from the right gastric artery (Fig. 4).

Six months after the procedure, the patient was doing well without evidence of recurrent bleeding or acute or chronic abdominal ischemic complications.

Discussion

Visceral aneurysms and pseudoaneurysms are rare vascular lesions that represent less than 5% of all truncal aneurysms [5]. Celiac trunk aneurysms are the fourth most common of the splanchnic artery aneurysms and pseudoaneurysms, and are less common than splenic, hepatic, and superior mesenteric artery aneurysms [1].

The most common cause of splanchnic artery aneurysms is atherosclerotic degeneration, followed by pancreatitis, abdominal surgery, infection, collagen vascular disease, arteritis, and congenital anomalies [2, 5].