

Endovascular treatment is less invasive than thoracotomy and has a lower incidence of complications. Metallic coils represent the preferred embolization material in most of the reported cases (4). Other materials used are PVA particles, microcoils, n-butyl cyanoacrylate, absolute alcohol, and gelatin sponge particles. Lee et al (5) preferred gelatin sponge particles and microcoils in view of the risk of regurgitation of permanent embolic materials, which would cause rapid and massive tissue necrosis. A combination of coils and PVA has also been used (4). We too preferred to use PVA particles initially to embolize the smaller branches, in which coil embolization would have been difficult. This also slowed the flow in the major feeding artery and allowed the coil to stay in a proximal location. The risk of nontarget embolization should be considered, especially if preliminary digital subtraction angiography shows an element of arteriovenous fistula. The pulmonary veins in our case were opacified in the venous phase, and hence we presumed there was no major shunting. Nevertheless, presence of minute shunts could not be excluded, so we used larger PVA particles to avoid systemic embolization. Partial embolization and nonregression of the sequestered tissue after embolization occurs in 25%–47% of cases, some of which would later require surgery (3). Various reported complications include distant migration of embolization material causing inadvertent embolization of nontarget arteries, infection, puncture site thrombosis, pain, and fever (3). After reviewing various reports, we suggest the use of coils as embolization material; PVA can be used if the element of shunting is excluded.

In conclusion, intralobar sequestration in adults may present with hemoptysis. Although surgery is the conventional choice of treatment, embolization of the systemic arteries can be a safe alternative method. Metallic coils are most commonly used. More studies are needed to firmly establish its role in adults.

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Nonocclusive “Island” of Stenosis after Suture-mediated Arteriotomy Closure

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Editor:

Herein, we present a case of nonocclusive arterial wall apposition within the common femoral artery following suture-mediated arteriotomy closure by using a Proglide device (Abbott Vascular Devices, Redwood City, California) that turned out to be clinically benign at 12-month follow-up. A 73-year-old man presented in 2005 with progressive bilateral calf claudication, worse on the right. Right common iliac artery stenosis was noted in the right iliac system at magnetic resonance (MR) angiography. Angiography helped confirm a 70% stenosis, and angioplasty with stent placement was performed uneventfully with a right common femoral artery approach. At the time of access, imaging was performed in 20° right anterior oblique projection to lay out the femoral bifurcation, revealing a puncture site in the midportion of the common femoral artery as recommended by the Proglide manufacturer. Following completion of the intervention, the arteriotomy was closed with a 6-F Proglide device. Immediate hemostasis was achieved. The patient was seen 5 months later with recurrent right calf claudication. MR angiography performed at that time revealed a high-grade right superficial femoral artery stenosis. Endovascular treatment was undertaken with use of an antegrade right common femoral artery approach, and a 6-F sheath was used for procedural access. The superficial femoral artery stenosis was treated uneventfully with angioplasty and stent placement.

At the termination of the procedure, sheath injection was performed for puncture site evaluation before the planned arteriotomy closure. We noted a peculiar irregularity within the common femoral artery adjacent the sheath entry site. The appearance on initial angiograms was suggestive of puncture site thrombus (Fig 1); however, further evaluation with multioblique angiography revealed something altogether different. An island of apposition between the anterior and posterior common femoral artery walls in the midportion of the vessel with ready flow of contrast medium around the island both medially and laterally was present (Fig 2). Review of multiple imaging studies obtained before the identifying angiogram revealed this peculiarity had been present since the initial iliac arterial intervention at the termination of which Proglide suture-mediated closure had been performed, but not before. The abnormality was believed to represent anterior and posterior wall apposition that occurred during suture-mediated closure following the initial iliac intervention. Interestingly, in this case, the result was incomplete vessel occlusion, with a persistent dual channel. Furthermore, this flow configuration was stable, without subsequent thrombosis, for 5 months between the

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Figure 1. Initial femoral arteriogram obtained before sheath removal demonstrates an intraluminal filling defect (arrow) adjacent to the sheath entry site, which is suggestive of procedure-related thrombus formation.



Figure 2. Oblique femoral arteriogram reveals apposition of the anterior and posterior artery walls resulting in an "island" of unopacified vessel (arrow).

two procedures with antiplatelet agent use, but without anticoagulation. The configuration of the abnormality was confirmed with contrast medium-enhanced computed tomography (CT) (Fig 3).



Figure 3. Contrast-enhanced CT scan of the pelvis obtained 18 months after the initial identification of the abnormality demonstrates a thin linear strand of tissue bridging the common femoral artery anterior and posterior walls (arrow).

We have not previously encountered a suture-mediated vessel closure resulting in neither a complete occlusion, nor a simple stenosis, but rather an island of apposition between the anterior and posterior arterial walls. Jang et al (1) described nine cases of common femoral artery stenosis caused by tied suture material related to the use of the Perclose device. All nine of the stenoses caused claudicatory symptoms, one of which was surgically found to have a thick fibrous web in the center of the right common femoral artery that caused simple luminal narrowing. This latter example may have been similar to our case, although no images were obtained (1). The web in question was resected and the artery closed without further symptoms. In general, these closure devices are considered safe, permitting faster hemostasis and earlier ambulation compared with manual compression, with no significant differences in local vascular complications (2). Commonly described vascular complications from both arterial closure devices and manual compression include hematoma, bleeding, arteriovenous fistula, pseudoaneurysm, and infection. Stenosis and occlusion have also been reported. Our patient had no demonstrable sequelae related to the closure device complication, although the stenosis at the site may have contributed to the claudication severity. Following superficial femoral artery intervention, the patient denied any residual right lower extremity claudication. Although balloon angioplasty of the area in question was considered an option for further treatment, due to the lack of symptoms no further therapy was performed.

When used according to manufacturer instructions, the Proglide device is advanced until pulsatile flow is identified through the marker lumen and then the footplate is deployed inside the vessel. The device is then retracted until flow through the marker lumen ceases, indicating that the footplate is flush against the anterior vessel wall. The two needles are then driven through the anterior vessel wall into the footplate and the contained suture is captured. This suture is then withdrawn to the skin surface and the knot closure completed. However, if needle deployment is done without adequate footplate apposition to the anterior vessel wall, before flow in the marker lumen ceases or, for instance, in the setting of marker lumen thrombosis, the posterior portion of the footplate may be positioned against the pos-

terior vessel wall. This can theoretically result in the caudal needle entering the posterior vessel wall, with subsequent suture passage through the needle tract and, thus, through a portion of the posterior vessel wall as well. This will result in suture-mediated apposition of the anterior and posterior vessel walls as the knot is tightened, with subsequent stenosis or occlusion of the entry site vessel or, as in our case, formation of a thin island of tissue connecting the anterior and posterior vessel walls. Suture-mediated vessel complications such as these usually require emergent intervention (3), although the use of an endovascular cutting balloon for simple stenoses has been reported with good results (4). Our case appears to be unusual, not only in the resulting anatomic configuration but also in that the untreated outcome was without obvious sequelae. Because these polyester sutures are not absorbed and no significant change in tensile strength has been known to occur in vivo, such a malformation will likely be permanent and its prognosis at this point is unknown.

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Sclerotherapy for Peribiliary Cysts Accompanied by Biliary Stenosis

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Peribiliary cysts are typically small and rarely cause clinical problems. However, some cases are complicated by biliary stenosis, cholangitis, and obstructive jaundice (1,2). We performed sclerotherapy for peribiliary cysts and obtained good outcomes. Our institutional review board did not require an approval to report this case study.

The patient was a 70-year-old woman with a history of hypertension and diabetes mellitus. Tumor of the pancreatic

head and peribiliary cysts (Figure, a), with dilation of the right anterior intrahepatic bile duct, were identified on screening abdominal computed tomography (CT). Pancreaticoduodenectomy was performed, and the pathologic diagnosis was invasive ductal adenocarcinoma. The postoperative course was good and the patient was discharged without complications. However, fever and vomiting became evident 1 month after discharge. Laboratory data revealed elevated biliary enzyme levels. We considered that cholangitis occurred postoperatively in the static right anterior intrahepatic bile duct. Antibiotics were administered, but clinical improvement of cholangitis was insufficient. Percutaneous transhepatic cholangiography revealed stenosis of the right anterior intrahepatic bile duct and the bilioenteric anastomosis (Figure, b).

Because these two strictures might cause cholangitis, both were treated to prevent recurrent cholangitis. Sclerotherapy was performed for the biliary cysts and balloon dilation for the bilioenteric anastomosis. Minocycline hydrochloride was used as a sclerosant, with a similar procedure as for hepatic cysts (3–5). A cyst existing lateral to the bile duct stenosis was punctured with use of an 18-gauge long Happy Cath (Togo Medikit, Miyazaki, Japan), and 0.7 mL of transparent fluid was aspirated. Contrast material was injected to confirm an absence of leakage and fistulization. After aspiration of contrast material, 0.6 mL of minocycline hydrochloride (20 mg/mL) was injected. The sclerosant was left for 30 min, then completely aspirated. Another two cysts, just medial to the right anterior intrahepatic bile duct, were treated in a similar fashion, but the sclerosant was not aspirated fully. The cysts were not round on fluoroscopy. The bilioenteric anastomotic stricture was treated with 3-minute balloon dilation with use of an 8-mm balloon catheter. A 12-F drainage catheter (Cliny; Create Medic, Yokohama, Japan) was left over the anastomosis with the proximal tip buried under the skin. The drainage catheter was left for 6 months over the anastomosis. Cholangiography performed 6 months after sclerotherapy revealed improvement of both strictures (Figure, c). Compression remained from another small cyst, but passage was acceptable. CT demonstrated reduction or disappearance of treated cysts. Other cysts near the treated cysts enlarged after sclerotherapy (Figure, d).

Effective treatment for peribiliary cysts causing biliary stenosis has yet to be established. Treatment options include surgery (2), which was not deemed to be suitable for this patient because of a history of abdominal surgery and a presence of diabetes mellitus and advanced age. We attempted sclerotherapy for enlarged cysts near the biliary stenosis, as reducing the size of cysts was considered an effective and minimally invasive method of treatment. Simple aspiration may be assumed to result in recurrence by reaccumulation of exudates from the epithelium of the cysts. Conversely, sclerotherapy may damage the epithelium and is therefore suggested to prevent reaccumulation of exudates. Various sclerosing agents including minocycline hydrochloride, hypertonic saline solution, ethanol, and ethanolamine oleate have been described in the treatment of hepatic cysts. Although there has been no evidence to suggest the most appropriate agent, we selected minocycline hydrochloride as an agent because it is commonly used and has been shown to be effective without causing considerable side effects or complications in the treatment of hepatic cysts. The efficacy of minocycline hydrochloride is related to the low pH of the solution, with concentrations of 20–25