Porto-gastric fistula due to penetration of metallic coil into the stomach: a rare complication of endovascular treatment of gastric varices
A case report

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Abstract. *The authors report a rare complication of the endovascular treatment of gastric varices. The case of a 68-year-old female with liver cirrhosis due to hereditary haemochromatosis with uncontrolled gastric variceal bleeding as the first clinical symptom of portal hypertension is presented. She underwent a successful urgent TIPS (transjugular intrahepatic portosystemic shunt). Large portosystemic collaterals were embolised by metallic coils and n-butyl-2-cyanoacrylate during the procedure. Despite adeqatue hepatic venous pressure gradient reduction, re-bleeding from gastric varices occurred afterwards. Bleeding was successfully treated by local acrylate glue application during endoscopy. Control gastroscopy was performed without any sign of bleeding three weeks later, showing coil penetration into the gastric lumen. The coils were left in situ and patient was discharged without any sign of complications. Eleven months later the coils separated out and only the scar was found at upper endoscopy.*

Key words: *TIPS, embolisation, gastric varices, metallic coil*

Kupková B, Fejfar T, Krajina A, Hůlek P, Tachecí I, Bureš J. Porto-gastrická píštěl způsobená penetrací kovových spirál do žaludku: neobvyklá komplikace endovaskulární léčby žaludečních varixů. Kasuistika. Folia Gastroenterol Hepatol 2006; 4 (3): 107 – 111.

Souhrn. *Autoři prezentují neobvyklou komplikaci endovaskulární léčby žaludečních varixů. Popisujeme případ 68-leté ženy s jaterní cirhózou na podkladě hereditární hemochromatózy s gastrickým variceálním krvácením jako prvním projevem portální hypertenze. Z důvodu nekontrolovatelného krvácení ze žaludečních varixů podstoupila úspěšně urgentní TIPS (transjugulární intrahepatální portosystémovou spojku). Současně s vytvořením TIPS byla provedena embolizace velkých kolaterál pomocí kovových spirál a n-butyl-2-cyanoakrylátu. Navzdory dostatečné redukci tlakového portosystémového gradientu došlo později k opakovanému krvácení, které bylo úspěšně ošetřeno aplikací cyanoakrylátu při gastroskopii. O tři týdny později při endoskopické kontrole nebyly přítomny známky krvácení, ale byla zjištěna penetrace embolizačních spirál do lumina žaludku. Spirály byly ponechány in*

situ, nemocná byla dále bez komplikací. O jedenáct měsíců později došlo k odloučení spirál a při endoskopii byla nalezena v původní lokalizaci spirál jen jizva.

Klíčová slova: *TIPS, embolizace, žaludeční varixy, kovové spirály*

The transjugular intrahepatic portosystemic shunt (TIPS) is now a well-established method of treatment for portal hypertension complications such as acute variceal bleeding or refractory ascites (6). Endovascular embolisation of gastro-oesophageal varices during the procedure is recommended. Because of the high risk of pulmonary embolism in the case of large portosystemic collaterals, the use of metallic coils before cyanoacrylate embolisation could be beneficial to decelerate the blood flow as such. Only rare complications of endo-coil use are reported in patients treated for complications of portal hypertension.

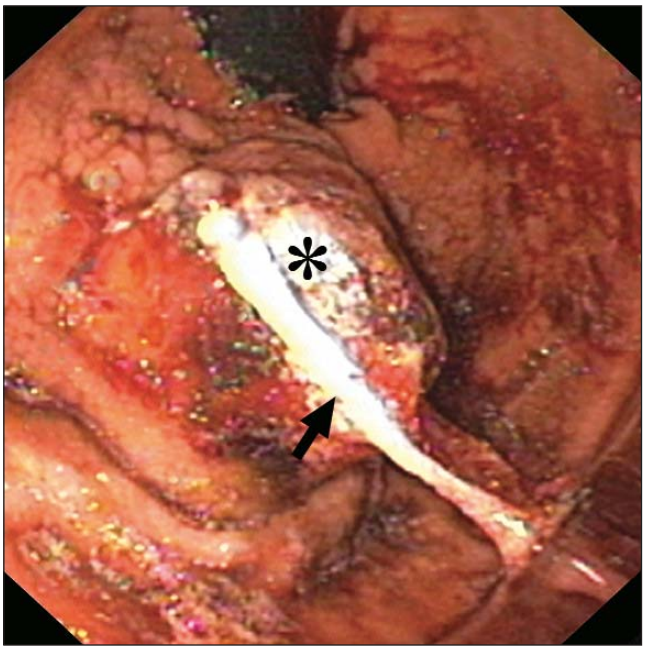

Figure 1
Large subcardial varix (asterisk) immediately after its endoscopic treatment. Acute bleeding was controlled by injection of cyanoacrylate (arrow).

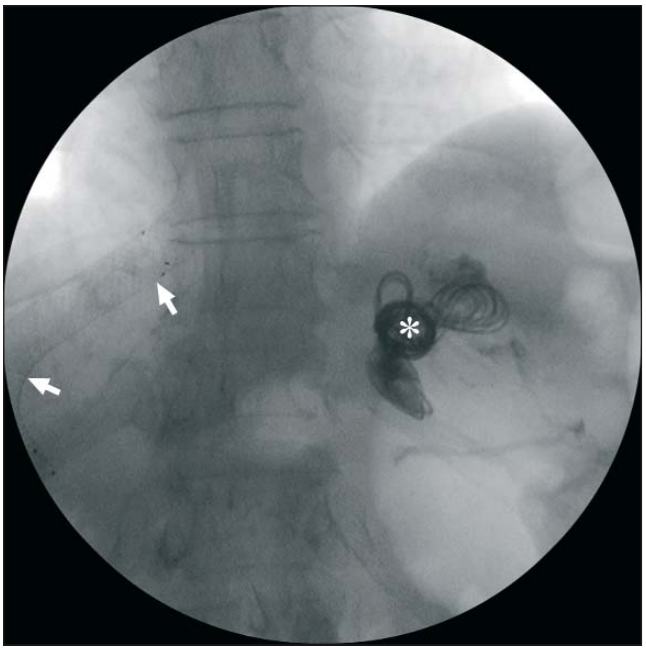

Figure 2
Metallic coils (arowheads) are nicely seen in the area of previously injected cyanoacrylate. Transjugular intrahepatic portosystemic shunt (arrows).

Case report

A 68-year-old female with liver cirrhosis (Child-Pugh C class) due to hereditary haemochromatosis and history of hepatocellular carcinoma treatment by radiofrequency ablation one year before (liver transplantation was not indicated because of age) was admitted to a regional hospital with symptoms of acute gastric variceal bleeding in September 2005. Severe gastrointestinal bleeding was the first clinical symptom of the portal hypertension. The patient was admitted to the intensive care unit, volume substitution was commenced and upper endoscopy was performed. It revealed gastro-oesophageal varices (GOV 2) with massive bleeding. Repeated sclerotherapy (using polidocanol) and vasoactive therapy was not successful. The patient was transferred in to our Department and TIPS was indicated. The TIPS procedure using a bare stent was performed, the portosystemic gradient decreased to 5 mm Hg. The initial portosystemic gradient was not measured since the procedure was urgent and there was no doubt about the presence of portal hypertension. Because of the presence of large portosystemic collaterals, we used coil embolisation of the gastric varices with consecutive application of n-butyl-2-cyanoacrylate (Histoacryl, Braun, Germany). Although the bleeding stopped during the procedure we noticed a clinically significant re-bleeding episode eighteen days after TIPS (decline in haemoglobin from 92 to 73 g/L, INR 2.72; several transfusions were administrated to maintain haemoglobin up to 100 g/L). Therefore the revision of the TIPS was performed but with a good shunt patency (with hepatic venous pressure gradient 7 mm Hg). The upper GI endoscopy found GOV2 with acute bleeding from ulcer after the previous

polidocanol sclerotherapy. The recurrent bleeding was successfully stopped using an injection of cyanoacrylate (Fig. 1). Three weeks later the elective CT scan showed the suspected presence of the embolisation coils near the gastric lumen. The patient underwent repeated upper endoscopy under fluoroscopy control with confirmation of the slight protrusion of the embolisation coils with cyanoacrylate into the stomach (Figs. 2-4). The coils were left in situ, and the patient was discharged. During the follow up, the patient was left without any further complications and without any signs of re-bleeding on the upper endoscopies. Six months after the TIPS there was evident extrusion of coils into the stomach, so we tried to remove them by using forceps. The coils were still fixed to the tissue and we were not successful in releasing them (Fig 5). Eleven months after TIPS the coils left per vias naturales. The last endoscopy control was performed after eleven months in September 2006. In the subcardial area there was the scar after the previous ulceration and remnants of cyanoacrylate but no coils (Fig 6). Till this time the patient has been free of symptoms of bleeding, TIPS is patent.

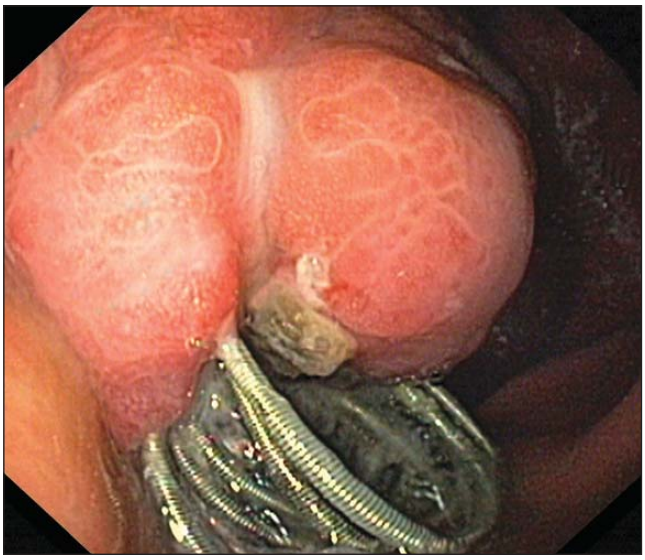

Figure 3
Retroflexion endoscopic view of the gastric fundus. Metallic coils are protruding from the large varix.

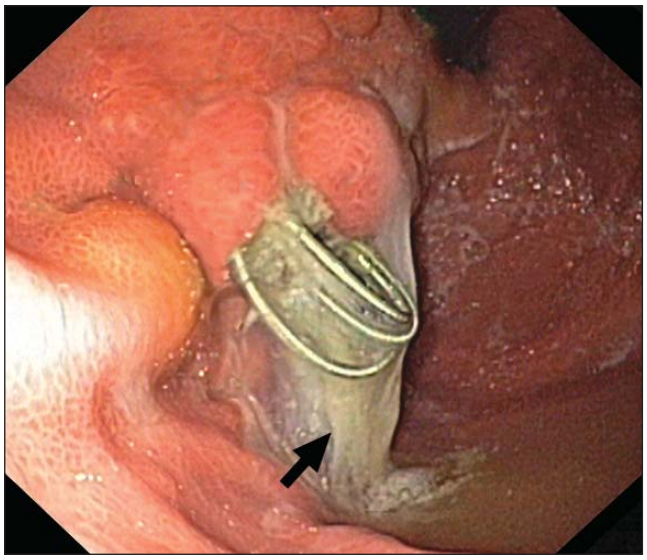

Figure 4
Metallic coils and remnants of "born" cyanoacrylate (arrow) from the subcardial varix.

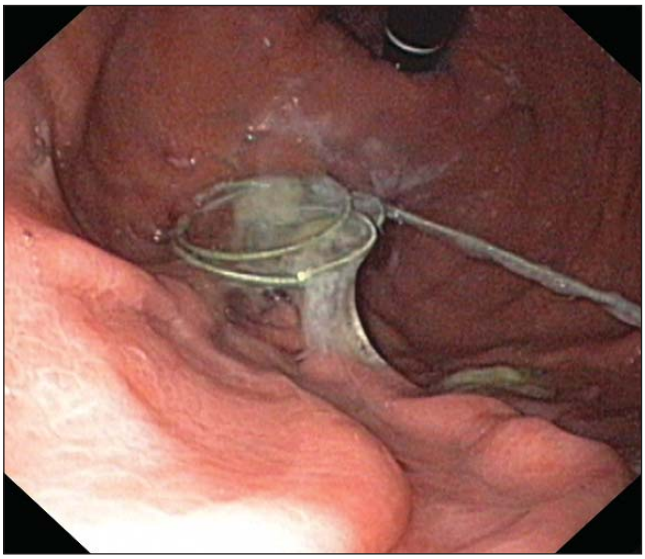

Figure 5
Further proceeding of metallic coils from the subcardial varix into the stomach. One end of the coil was fully liberated, nevertheless repeated attempts to remove it endoscopically were not successful.

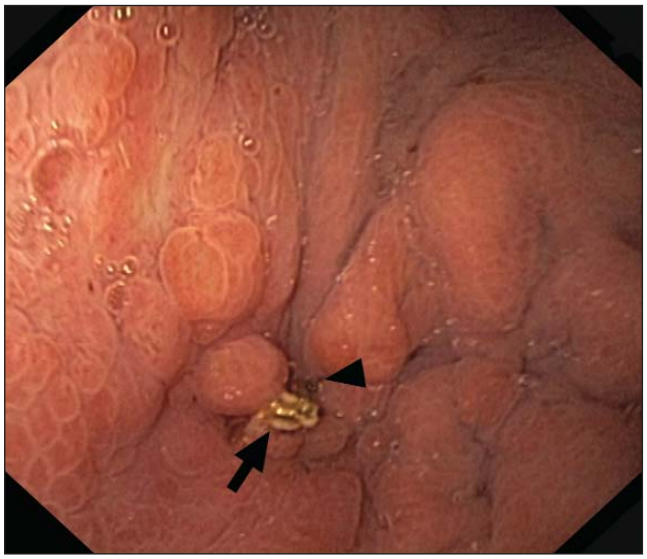

Figure 6
Control gastroscopy eleven months after endoscopic cyanoacrylate injection and radiological coil embolisation of gastric varices. A retroflexion endoscopy view into the gastric fundus shows a tiny scar (arrowhead) with remnants of cyanoacrylate (arrow). Porto-gastric fistula is fully healed.

Discussion

Our case shows difficulties in variceal bleeding management and the inappropriate use of polidocanol in the treatment of gastric (not oesophageal) varices. The presented case of porto-gastric fistula after endovascular obliteration of the gastric varices is exceptional and interesting for two reasons. Firstly the method chosen for the treatment of the acute bleeding from gastric varices elsewhere (injection of polidocanol) is not generally recommended because of the high risk of complications. In our case the subsequent gastroscopy with the injection of cyanoacrylate was performed to good effect. It is known that the majority of gastric varices can be treated successfully with endoscopic injection of cyanoacrylate (a tissue adhesive agent) (13-15), following the Baveno consensus (4,12). The efficiency of this treatment in achieving initial haemostasis in these cases is 83 % – 100 % (13,14). However, relatively high rates of re-bleeding (20 % – 25 %) were also described (1,14). As in oesophageal varices the variceal band ligation could be used when we are in doubt of the source of the bleeding (oesophageal vs. gastro-oesophageal varices – GOV1 or 2 type) (4).

Secondly, TIPS is effective in reducing portal pressure and is widely used in patients with variceal bleeding or refractory ascites associated with portal hypertension for over 10 years (10,16). TIPS was shown to be effective in the treatment of acutely bleeding gastric varices with haemostasis rate of over 90 % and a re-bleeding rate of less than 30 % (4,18,19,22,23). However, the TIPS procedure has some disadvantages, too. First there is a poor primary shunt patency rate (50 % – 60 % of cases at one year) if a bare stent is used and second hepatic encephalopathy, which occurs in about 20 % – 30 % of patients (10,16).

Consecutive large portosystemic collaterals embolisation is recommended in some cases (20) and we have been using this approach for this issue, too. There are three main indications for occluding large portosystemic collaterals. The most frequent is embolisation of the left and short gastric veins in patients with a recent history of acute variceal bleeding, especially if the bleeding source was from gastric varices. Another indication is closure of large collaterals with continuing competitive flow after TIPS. In addition, patients with a history of portosystemic encephalopathy or patients at high risk of that condition may benefit from embolisation of large portosystemic collaterals performed during calibrated TIPS (6). Therefore, we performed embolisation of the left gastric vein by the cyanoacrylate and because of the high risk of pulmonary embolism, coils were used to slow down the blood flow (9). The most frequent complication is misplacement or dislodgment of a coil into the portal vein or inadvertent embolisation of glue into the portal vein. For this reason when extra-large shunts (some splenorenal spontaneous shunts) are embolised the reversed scenario is used – balloon occluded retrograde transvenous obliteration is recommended (19).

Although in our case the TIPS procedure was effective in reducing hepatic venous pressure gradient below 7 mm Hg and large portosystemic collaterals were embolised successfully by coils, re-bleeding appeared eighteen days after the procedure. The reason could not only be the ulcer caused by previous polidocanol injection but the presence of coils in the gastric wall after embolisation could play a role, too. In patients treated using coils for arterio-venous malformations, the displacement of coils is reported as mentioned above. (24). This complication is quite rare in patients with portal hypertension undergoing portosystemic collateral embolisation (23).

These cases illustrate the potential for penetration of the gastric mucosa by the material used for coil embolisation (2,3,5) of gastric varices during a TIPS procedure. Although the significance of this complication is unclear, it may potentially contribute to further bleeding or technically complicate liver transplantation. It should be noted that, there are no controlled trials assessing the efficacy of coil embolisation in managing variceal bleeding (7,8,11,21). But from our point of view use of coils in large portosystemic collaterals is useful.

In our case the complication of inappropriate polidocanol use in the treatment of gastric varices is linked with very rare complication of coil use in portosystemic collaterals embolisation.

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