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Case Report

Bacterial meningitis after incomplete retrograde obliteration for duodenal varices with encephalopathy: A case report

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ABSTRACT

We report a case of bacterial meningitis in a 72-year-old female with nonalcoholic steatohepatitis who underwent incomplete retrograde obliteration for duodenal varices with encephalopathy. Two months after incomplete retrograde obliteration, she became febrile, drowsy, and was transported to hospital. Her serum ammonia level was normal. Endoscopy revealed that previously embolized coil was partially migrated into the duodenal lumen. Cerebrospinal fluid examination confirmed the diagnosis of bacterial meningitis. She was treated with intravenous antibiotics. As there was a risk of bleeding, trans-ileocolic vein obliteration of duodenal varices was attempted. The patient slowly recovered and was discharged. This case indicated two problems could occur by coil migration after incomplete retrograde obliteration for duodenal varices with encephalopathy. One was bacterial meningitis and the other was risk of bleeding from duodenal varices. We conclude that cerebrospinal fluid examination is recommended for patients with high fever and abnormal mental status after incomplete retrograde obliteration, and immediate complete obliteration should be attempted for a risk of bleeding.

Introduction

Retrograde obliteration has become principle treatment for gastric varices or portosystemic encephalopathy. We have performed retrograde obliteration via internal jugular vein, which we called transjugular retrograde obliteration [1,2]. Complications after retrograde obliteration are minor [1,3]. Bacterial meningitis after retrograde obliteration has not been reported. Bacterial meningitis is an unusual complication of patients with liver disease [4–6]. A patient with liver disease who becomes confused or drowsy can be misdiagnosed as hepatic encephalopathy. This report describes a case in which bacterial meningitis developed after incomplete retrograde obliteration for duodenal varices with encephalopathy.

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Case report

A 72-year-old female with nonalcoholic steatohepatitis was treated for duodenal varices with portosystemic encephalopathy. She underwent incomplete retrograde obliteration for duodenal varices 2 months ago. According to Sherlock's classification [7], she had grade II encephalopathy. The plasma ammonia level was abnormally elevated to 147 μg/dL (normal range, 12-66 μg/dL) . The retention rate of indocyanine green at 15 minutes (ICG15) was 41 % (<10%). Hepatitis B surface antigen and hepatitis C virus antibody were negative. Antinuclear antibody and antimitochondrial antibody were negative. Endoscopy revealed huge tortuous duodenal varices at the 2nd position (Fig. 1a). 3D-CT demonstrated that the duodenal varices were supplied by the right colic vein and pancreatoduodenal vein and drained into inferior vena cava via right ovarian vein (Fig. 2a). The spleen volume was 189 mL, the liver volume was 595 mL and spleen/liver volume ratio [8] was 0.32. The diameter of portal vein was 7.0 mm and the diameter of splenic vein was 6.0 mm. For retrograde obliteration, an 8Fr. cobra-shaped long sheath was inserted into the inferior vena cava via the right internal jugular vein. Then 6Fr. occlusive balloon catheter was inserted selectively into the right ovarian vein. Obliteration of duodenal varices was attempted by using microcoils, 6.5 mL 50% glucose, 1.5 mL absolute ethanol and 3 mL 5% ethanolamine oleate with iopamidol (Figs. 3a and b). Although 3D-CT after retrograde obliteration revealed obliteration of duodenal varices was incomplete (Fig. 2b), the encephalopathy improved to grade 0, and the plasma ammonia level reduced to 39 μg/dL.

Two months after incomplete retrograde obliteration, she became febrile, drowsy, and developed urinary incontinence. Emergency admission notes showed diagnosis of recurrence of hepatic encephalopathy. At admission, her body temperature was 39.7°C. She was disoriented, however, neck rigidity was not evident and Kernig's sign was negative. Laboratory studies revealed a hemoglobin of 9.7 g/dL and a total leukocyte count of 14500/μL (3500-8000 /μL). Total platelet count of 13.1 × 10^4/μL (12.3-33.1 × 10^4/μL), total bilirubin 1.3 mg/dL (0.3-1.3 mg/dL), albumin 3.5 g/dL (3.8-5.0 g/dL), aspartate transaminase 37 U/L (10-32 U/L), alanine transaminase 28 U/L (5-27 U/L), prothrombin time 91.6% (70-130 %), C-reactive protein 16.4 mg/dL (<0.16 mg/dL), procalcitonin 30.8 ng/mL (<0.3 ng/mL). Her serum ammonia at 34 μg/dL did not appear to indicate hepatic encephalopathy. The Child-Pugh score was 9 and the class was B. Radiological (CT and US) investigation of abdomen showed mild ascites. Cerebral CT was normal. Endoscopy revealed markedly reduced duodenal varices. However, previously embolized coil had partially migrated into the duodenal lumen (Fig. 1b). A lumbar puncture revealed purulent cerebrospinal fluid. Cerebrospinal fluid examination revealed cell count of 1542 /μL (0-5 /μL) (78.5% polymorphs and 21.5% lymphocytes), sugar of 31 mg/dL (50-75 mg/dL) and proteins of 540 mg/dL (15-40 mg/dL). Bacterial meningitis was diagnosed; most likely due to bacteremia caused by partial migration of the coil following incomplete retrograde obliteration. She was admitted to intensive care unit. Initially, she was treated with intravenous antibiotics, meropenem hydrate. On 5th day, the results of culture and sensitivity test of antibiotics

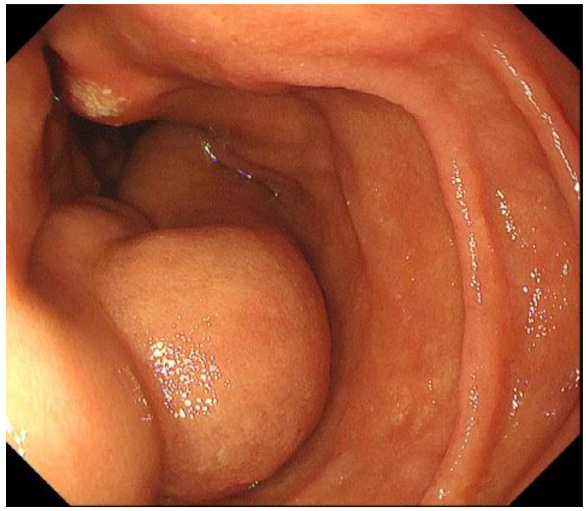

Fig. 1a – Endoscopy revealed huge tortuous duodenal varices at the 2nd position.

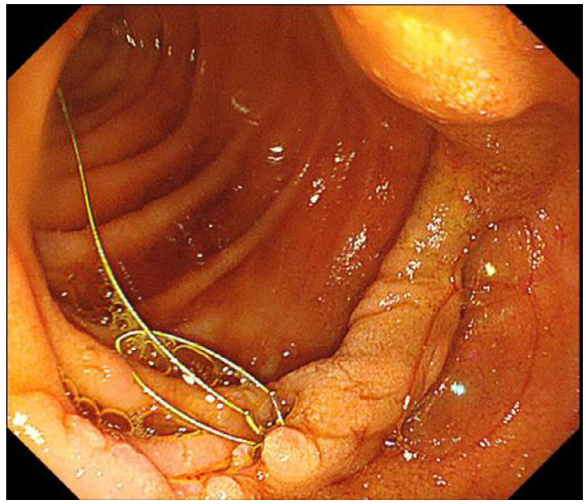

Fig. 1b – Endoscopy revealed markedly reduced duodenal varices. However, previously embolized coil was partially migrated into the duodenal lumen.

were reported that cerebrospinal fluid, blood, urine, sputum cultures were positive for klebsiella aerogenes which was sensitive to cefepim, and the antibiotics was changed to this antibiotic. It was administered for the next 14 days. Repeat blood and cerebrospinal fluid cultures were positive on 5th day. Subsequent tests results on 7th, 9th, and 12th days were negative.

It was thought that the anemia (hemoglobin of 9.7 g/dL) was due to precursory bleeding associated with coil migration from duodenal varices. As there was a risk of re-bleeding, on 5th day, trans-ileocolic vein obliteration of duodenal varices was attempted. Under general anesthesia, right pararectal mini-laparotomy was performed and 5Fr. sheath was inserted into the superior mesenteric vein via the ileocolic vein. A 5Fr. balloon catheter was inserted selectively into the right colic vein. Duodenal varices were completely obliterated using microcoils and 20 mL 50% glucose (Fig. 4a, and b). The portal

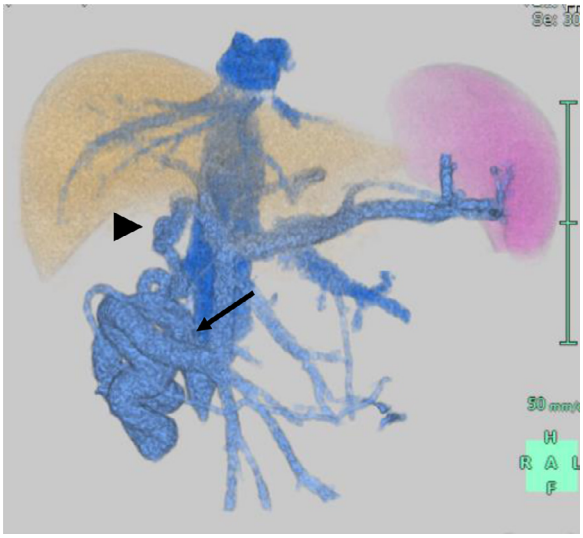

Fig. 2a – 3D-CT before retrograde obliteration showed that the duodenal varices were supplied by the right colic vein (arrow) and pancreatoduodenal vein (arrow head) and drained into inferior vena cava via right ovarian vein. The spleen/liver volume ratio was 0.32.

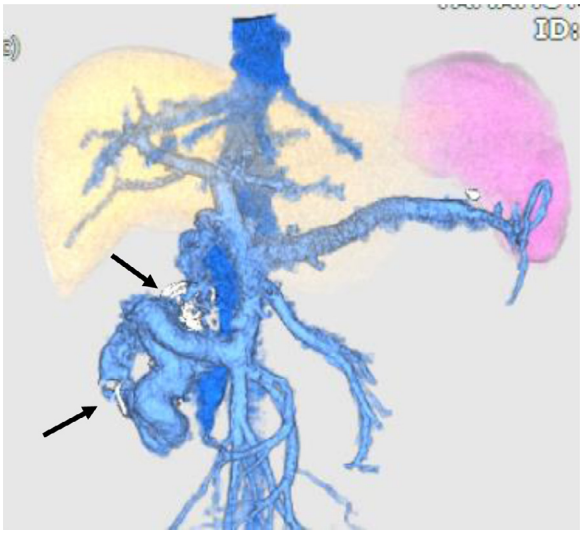

Fig. 2b – 3D-CT after retrograde obliteration revealed embolized coils (arrow), however, obliteration of duodenal varices was incomplete.

venous pressure increased from 21.0 cmH_2O to 25.5 cmH_2O causing increase in ascites. Partial splenic embolization with 60% infarction was performed on 12th day to control portal hypertension. The wedged hepatic venous pressure was 23.0 cmH_2O after partial splenic embolization. 3D-CT after trans-ileocolic vein obliteration and partial splenic embolization on the 15th day revealed completed embolization of duodenal varices (Fig. 2c). The spleen volume decreased to 85 mL, the liver volume increased to 889 mL. Corrected spleen/liver volume ratio was 0.10. The diameter of portal vein increased to 9.0 mm and the diameter of splenic vein decreased to 5.0 mm.

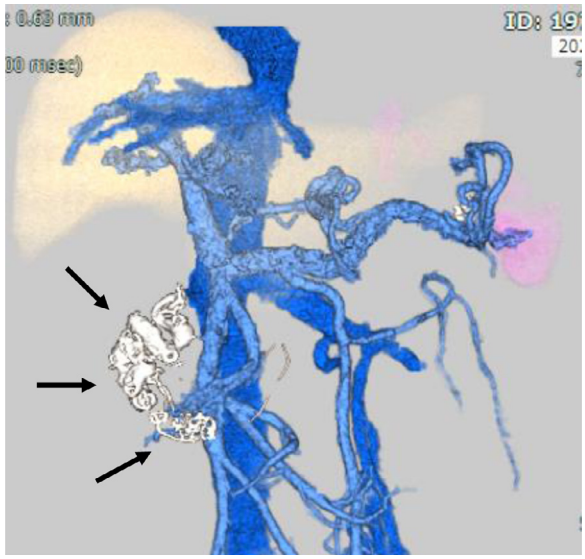

Fig. 2c – 3D-CT after trans-ileocolic vein obliteration and partial splenic embolization revealed completed embolization of duodenal varices (arrow). Corrected spleen/liver volume ratio was 0.10.

On 25th day, her body temperature rose to 39.2°C and blood culture was positive for klebsiella aerogenes. Cefepim was re-administered for the next 14 days. Blood cultures taken on the 34th and 41st day were negative for bacteria. The patient slowly recovered and regained neurological status by day 34. ICG15 improved to 19%. She was discharged on the 42nd day.

Discussion

We reported usefulness of retrograde obliteration for chronic portosystemic encephalopathy in 2000 [2]. Complications after retrograde obliteration are minor [1,3]. Bacterial meningitis after retrograde obliteration has not been reported. This report describes a case, who developed bacterial meningitis after incomplete retrograde obliteration.

In liver diseases, hepatic encephalopathy is common and usually presents with different degrees of disorientation, confusion, drowsiness, level of consciousness, and coma confusing meningitis. As in this case report; initial diagnosis before the second emergency conveyance was a recurrence of hepatic encephalopathy. Pauwels A et al. [4] reviewed a series of 16 cases of bacterial meningitis in patients with cirrhosis. Neck rigidity was missing in 44% (7/16) of cases. Lumbar puncture was performed because this patient had high fever. Bacterial meningitis was confirmed by cerebrospinal fluid examination.

Endoscopic injection sclerotherapy is known to be associated with transient bacteremia [9]. Incidence of bacteremia following endoscopic injection sclerotherapy varies from 2% to 50%. Bacteremia following upper gastrointestinal endoscopy has been reported in 3%-8% cases [5]. In this case, it was thought that bacteremia was caused by migrated coil that has bridged between duodenal lumen and the varices.

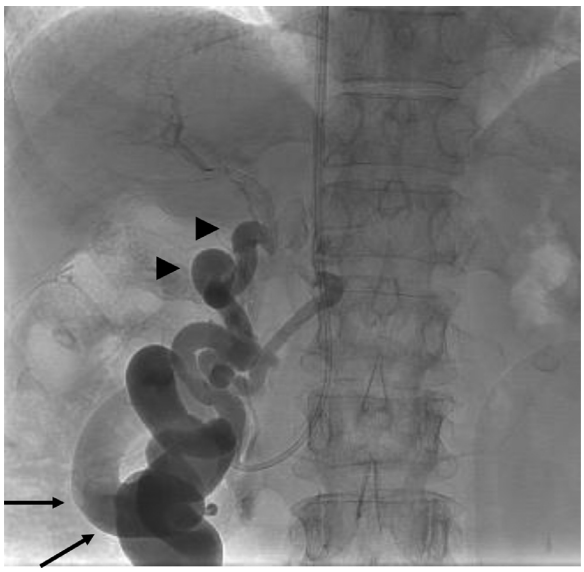

Fig. 3a – Retrograde right ovarian venography showed duodenal varices (arrow) and pancreatoduodenal vein (arrow head).

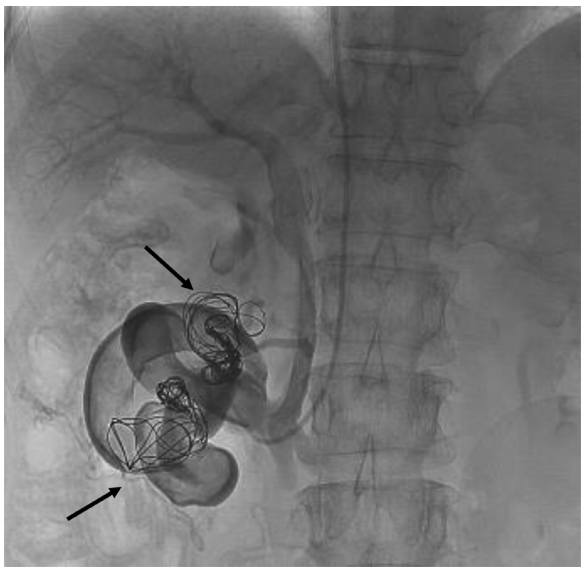

Fig. 3b – Obliteration of duodenal varices was attempted using by microcoils (arrow), 6.5 mL 50%glucose, 1.5 mL absolute ethanol and 3 mL 5%EOI.

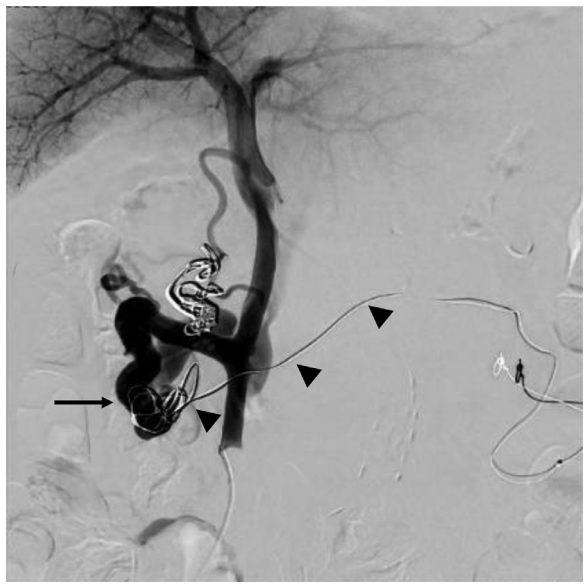

Fig. 4a – Superior mesenteric venogram showed duodenal varices (arrow) and migrated coil (arrow head).

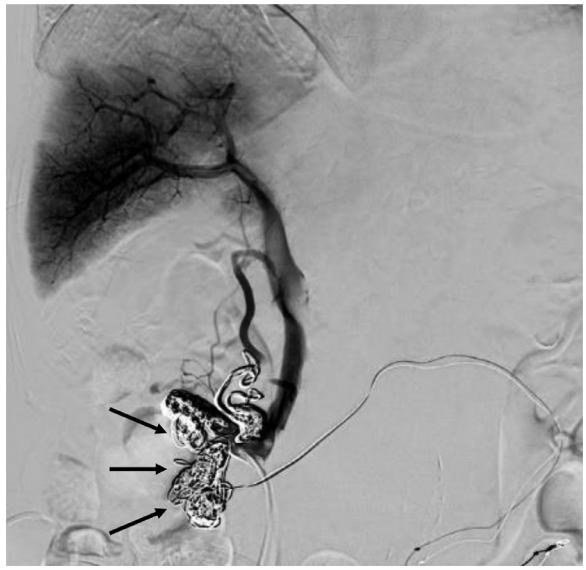

Fig. 4b – Duodenal varices (arrow) were completely obliterated using microcoils and 20 mL 50% glucose.

Bacterial meningitis in patients with cirrhosis is serious complication and may be fatal. Pauwels A et al. [4] reported that the mortality rate was 80% (8/10) in their Child-Pugh class C patients, while it was 33% (2/6) in Child-Pugh class A&B patients. When coil migration occurs, careful management is important. Unlike endoscopic injection sclerotherapy, retrograde obliteration was performed by aseptic technique. However, if coil migration from varices into gastrointestinal lumen happens, the condition resembles to endoscopic injection sclerotherapy. Prophylactic use of antibiotics for coil migration may be recommended. In this case, obliteration of duodenal varices was incomplete. So, immediate complete obliteration of duodenal varices might be necessary.

This case indicated two problems could occur by coil migration after incomplete retrograde obliteration for duodenal varices with encephalopathy. One was a diagnosis of bacterial meningitis and the other was a risk of bleeding from duodenal varices. We conclude that cerebrospinal fluid examination should be performed in patients with high fever and abnormal mental status after incomplete retrograde obliteration. Appropriate use of antibiotics and immediate complete obliteration

of duodenal varices should be attempted to prevent the risk of bleeding.

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