Case Report
Transcatheter embolization of small bowel bleeding in a patient with polyarteritis nodosa
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A B S T R A C T
Polyarteritis nodosa (PAN) is a rare vasculitis that focally affects the small and medium-sized arterial walls. Major gastrointestinal (GI) complications are hemorrhage and obstruction. We report a case of PAN in a 28-year-old male patient with abdominal pain and hematochezia. He underwent surgical resection for small-bowel ischemia and was diagnosed with PAN. Subsequently two sessions of angiography and embolization were performed for different sites of small bowel bleeding. Gelatin sponge particles and microcoils were used as embolic materials. Our patient’s outcome suggests that transcatheter embolization should be considered as an efficient method for the treatment for GI bleeding associated with PAN.

Keywords: embolization, gastrointestinal bleeding, polyarteritis nodosa

Introduction
Polyarteritis nodosa (PAN) is a rare disease, with a reported annual incidence of <1.6 cases/million inhabitants in European countries.1 It is a systemic vasculitis characterized by focal, pan-mural, necrotizing inflammation affecting small and medium-sized arteries. It is thought that immune complexes are active in the starting mechanism, however, the triggering antigen has not yet been identified.2 PAN is known to involve the gastrointestinal (GI) tract in ~50% of cases. Ischemia with infarction and hemorrhage are the most severe complications of GI tract involvement.3

We present a case of patient with abdominal pain with hematochezia associated with PAN and which was diagnosed and treated by surgery and embolization.

Case report
A 28-year-old man was seen in our emergency room with diffuse abdominal pain with melena and hematochezia of 2 days duration. Physical examination revealed tenderness of the entire abdomen, rebound tenderness, and mild rigidity. His vital signs were stable, and he was without fever. On laboratory examination, leukocytosis, 15.0 × 10^9/L, was revealed, whereas his hemoglobin, platelet, and ESR levels were normal. He had no significant past medical history. He was assessed with infectious enteritis and was treated with antibiotics.

However, after 3 days of treatment, the patient’s symptoms did not resolve. Active bleeding was also observed in his nasogastric tube. Contrast-enhanced computed tomography (CT) scans of the abdomen showed small bowel ischemia associated with low-grade obstruction (Fig. 1). The patient then underwent partial resection of the jejunum and jejunostomy. The pathological diagnosis was PAN. He was managed with cyclophosphamide and methylprednisolone, and his symptoms were relieved.

Seven days later, his clinical symptoms recurred. Abdominal CT scans revealed active bleeding in the proximal jejunum, away from the initial surgical field (Fig. 2A). An emergency arteriogram showed active bleeding from the jejunal branch of the superior mesenteric artery (SMA). Multiple, small aneurysms and luminal irregularities were revealed in the small branches of the SMA, renal artery, and hepatic artery, which were the typical angiographic sign of PAN (Fig. 2B). A 2.2-F microcatheter (Terumo, Tokyo, Japan) was used in a coaxial fashion to select the bleeding artery with contrast-agent extravasation. The bleeder was successfully embolized using gelatin sponge particles (300–500 μm; Alicon, HangZhou, China) and two microcoils (Cook Medical, Bloomington, IN, USA; Fig. 2C). Three days later, he was referred for angiography for recurrent hematochezia. The SMA arteriogram showed multiple, small an-
eurysms at small bowel branches and a new bleeding point in the ileum (Fig. 3A). The bleeder was successfully embolized using the same embolic materials mentioned above (Fig. 3B). The patient was improved and he was discharged home. He has since been on the PAN medication for 6 months and has been without concerning symptoms.

Discussion

PAN is a systemic, pan-mural, necrotizing vasculitis with two basic pathological changes of thrombosis and aneurysm formation, and thus leading to ischemia with infarction and hemorrhage. The GI tract involvement includes ulceration, perforation, hemorrhage, and/or obstruction, and the mortality rate is as high as 75% in patients with catastrophic GI tract involvement associated with PAN. Therefore, early diagnosis and proper treatment is very important for patients with PAN.

The diagnosis of PAN is difficult as the symptoms are diverse and no specific serological test exists, according to the American College of Rheumatology criteria for the classification of PAN. In our patient, the clinical manifestation was very similar to that of infectious enteritis. It is inadequate to perform a biopsy of the involved small bowel due to the risk of bowel perforation. Therefore, our patient’s pathologic diagnosis was not made until he underwent surgical resection for intestinal ischemia, and the diagnosis could be made based on either the angiographic findings or the pathologic result.

With the advantage of the minimally invasive endovascular approach, angiography can provide an effective alternative for diagnosing this rare disease. Demonstration of multiple aneurysms is the hallmark of the angiographic findings for PAN, and with a reported sensitivity of 89% and a specificity of 90%. The typical manifestation is multiple aneurysms 1–2mm in diameter and >10 in number. Segmental narrowing, dilation, and occlusions are the other common findings in the superior and inferior mesenteric arteries (97–100%), hepatic artery (89%), renal artery (87%), lumbar arteries (47%), intercostal arteries (24%), and gastroduodenal artery (8%). The presence of multiple aneurysms is thought to be related to the disease activity.

Once angiography confirms the diagnosis of PAN, a therapeutic, selective embolization can be simultaneously performed. Angiographic embolization has replaced surgical repair as the treatment of choice for GI bleeding. Transcatheter embolization using gelatin sponge particles, coil or a combination of both has been shown to Fig. 1. The preoperative CT scan shows multiple small bowel ischemia (arrow) associated with low-grade obstruction. CT = computed tomography.

Fig. 2. First session of embolization. (A) An enhanced CT scan shows active bleeding (arrow) from the jejunal loop. (B) SMA angiography shows contrast extravasation (arrow) from the jejunal loop and multiple, scattered, small aneurysms in the small bowel. (C) On postembolization angiography, the bleeding focus was embolized using gelatin sponge particles and two microcoils (arrow). CT, computed tomography; SMA, superior mesenteric artery.
be effective. Surgical intervention becomes necessary when nonsurgical attempts to stop the bleeding fail or the viability of the bowel is dubious.

In conclusion, PAN with atypical symptoms remains a serious clinical challenge. Multidisciplinary cooperation among physicians, surgeons, and interventional radiologists is, therefore, important. With improvements in catheter-based therapy and endovascular device development, angiography and an embolization procedure is considered as an efficient method for the diagnosis and treatment for GI bleeding associated with PAN.

Conflicts of interest

All authors have no conflicts of interest to declare.

References


Fig. 3. Second session of embolization 3 days after the first session. (A) SMA angiography shows another focus of active bleeding (arrow) from the ileum. (B) On post-embolization angiography, the bleeding focus was embolized using gelatin sponge particles and two microcoils (arrow). SMA, superior mesenteric artery.