Clinical Features and Therapeutic Options for Isolated Visceral Artery Dissection

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Background: The diagnosis of isolated visceral artery dissection (IVAD) has become more common with the increasing use of computed tomography angiography (CTA). We examined the presentation, treatment, and outcomes of patients with IVAD treated at our institution.

Methods: The records of 72 patients treated for IVAD between January 2010 and August 2014 were analyzed retrospectively. All were treated with antiplatelet or anticoagulant drugs after admission and were continued on oral aspirin for at least 1 year. Four asymptomatic and 52 symptomatic patients were managed conservatively with blood pressure control, bowel rest, fluid supplementation, and nutritional support. Two patients underwent open surgery because of hematochezia and 16 underwent endovascular bare-metal stenting.

Results: Symptoms gradually resolved in those treated conservatively, and favorable arterial wall remodeling was observed in 16 patients. Twenty-one stents were implanted in 16 patients with superior mesenteric artery dissection; 3 patients required overlapping stents. During follow-up (range, 3–53 months), all patients were symptom-free, and there were no recurrences. Follow-up CTA of patients who underwent endovascular stenting demonstrated satisfactory stent and true lumen patency.

Conclusions: IVAD is not uncommon. It occurs most frequently between the ages of 46 and 60 years and affects more men than women. A favorable outcome can be achieved in most of the patients with conservative management. Ischemic bowel necrosis is rare but requires open surgery. Endovascular bare-metal stenting is recommended when there is persistent abdominal pain, progression of the lesion, apparent stenosis of a true lumen compressed by a false lumen, or dilation of false lumen at a high risk of rupture.

INTRODUCTION

Isolated visceral artery dissection (IVAD), which comprises mainly superior mesenteric artery dissection (SMAD) and celiac artery dissection (CeAD), is defined as dissection of a visceral artery without aortic dissection. Most IVADs are SMADs,[1] the first case of which was reported in 1947.[2]

With the development of advanced imaging techniques, especially multidetector-row computed tomography reconstruction imaging and computed tomography angiography (CTA), an increasing number of patients with unexplained acute abdominal pain are being diagnosed with IVAD.[3,4]

Risk factors for IVAD include arterial hypertension, diabetes mellitus, arteriosclerosis, long-term excessive alcohol consumption (>200g per day), long-term cigarette smoking (>1 pack per day), and connective tissue disorders.[4–6] Three therapeutic strategies have been proposed: conservative management, open surgical repair, and endovascular stent placement,[7,8] but there is no consensus on the standard of care. Between January 2010 and

Conflicts of Interest: None.

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August 2014, 72 patients with IVAD were admitted to the vascular department of the Clinical Medical College of Yangzhou University, China. Their demographic and clinical characteristics, therapeutic procedures, and short- and long-term outcomes were recorded and analyzed.

MATERIALS AND METHODS

The ethics review committee of the Clinical Medical College of Yangzhou University, China, gave approval for the conduct of this retrospective observational study.

Diagnosis

All patients were diagnosed by CTA. Based on these imaging findings, IVAD was categorized according to the classification system of Yun et al.[9]: type I, patent true and false lumens with entry and reentry sites; type IIa, patent true and false lumens without reentry; type IIb, patent true lumen but thrombosed false lumen; and type III, artery occlusion.

Therapeutic Procedures

All patients diagnosed with IVAD were initially managed conservatively by maintaining blood pressure within the normal range. Asymptomatic patients were treated with an oral antiplatelet drug and a bland diet. Symptomatic patients were placed on bowel rest with intravenous fluid supplementation and parenteral nutritional support, and an oral diet was gradually reinstituted and progressively increased after resolution of abdominal pain.

Antithrombotic therapy with oral antiplatelet medication was initiated for mild to moderate stenosis of a visceral artery (VA); if VA stenosis was severe (>70%), an anticoagulant was started to prevent thrombosis of the trunk and branches. All patients received aspirin for at least 1 year. Repeat abdominal CTA was performed in all patients 5–7 days after the initial diagnosis of IVAD.

Over the course of conservative treatment, endovascular treatment was undertaken in the event of: persistent abdominal pain not alleviated by 7 or more days of conservative treatment, or recurrent abdominal pain after initial relief[10]; signs and symptoms suggestive of bowel ischemia; progression of artery dissection on CTA; apparent stenosis of a true lumen compressed by a false lumen; or dilation of a false lumen to a diameter >2.0 cm.[11,12]

Endovascular procedures were carried out via the femoral artery. Once the catheter had been introduced into the SMA or celiac artery, anteroposterior and lateral arteriograms were performed to determine the location of the intimal tear, the presence of blood flow in the false lumen, and the presence or absence of dilation of the VA aneurysm. The distance from the VA ostium to the origin of the intimal tear site, the diameter of the normal proximal artery, and length of the dissection were measured. The diameter and length of the stents required were determined from the diameter of the normal proximal VA and the length of the artery dissection. Either a self-expandable stent (Precise® Nitinol Stent System; Cordis Corp, Fremont, CA) or a balloon-expandable stent (Scuba CO-CR Peripheral Stent System; Medtronic, Inc., Minneapolis, MN or Hippocampus Renal RX Stent System, Cordis) was selected. Patients received antithrombotic therapy with low molecular weight heparin for 3 days postoperatively and were then treated with aspirin for a minimum of 1 year.

Open surgery, consisting of intimectomy of the dissected artery, revascularization, or bowel resection and anastomosis[13] was performed when patients developed signs of bowel infarction, including hematochezia, abdominal tenderness, rebound tenderness, or a rigid abdomen.

Follow-up

Follow-up consisted of an outpatient review at 3, 6, and 12 months after discharge for the first year, and annually thereafter. At each review, abdominal signs and symptoms were investigated and abdominal CTA was performed.

RESULTS

The demographic and clinical characteristics of the 72 patients are presented in Table I: 60 patients (83.3%) were aged between 40 and 60 years; 66 were men (91.7%); and 67 were diagnosed with SMAD (95.1%), 4 with CeAD (5.6%) and 1 (1.4%) with SMAD accompanied by CeAD. The diagnosis was made incidentally in 4 asymptomatic patients during routine physical examination or during investigation for another condition. Sixty-eight symptomatic patients were hospitalized with sudden upper or midabdominal pain lasting 4 hr to 3 months (median 24 hr). In one patient, IVAD was complicated by severe deformity of the thorax and spinal column and severe distortion of the aorta. Two symptomatic patients were not correctly diagnosed or treated until 3 months after initial presentation; 18 patients had associated nausea and vomiting without hematochezia.