CASE REPORT

Spontaneous dissection of the celiac trunk: What is the best therapeutic approach?

Dissecção espontânea do tronco celíaco: Qual a melhor abordagem terapêutica?

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Abstract

Spontaneous dissection of visceral arteries is a rare event. Sudden abdominal pain in the epigastrium is the most frequent symptom. Advances in imaging techniques have made it easier to diagnose this event, increasing the incidence of visceral artery dissection. Conservative clinical treatment, surgical revascularization and endovascular repair are the three treatment options available. We describe two cases of patients with spontaneous dissection of the celiac trunk that received different treatments based on their clinical presentation and imaging studies. We also conducted a review of studies about this condition in the literature.

Keywords: celiac trunk; spontaneous dissection; endovascular.

Resumo

A dissecção espontânea das artérias viscerais é um evento relativamente raro. Dor abdominal súbita no epigástrio é o sintoma mais frequentemente manifestado pelos pacientes. O avanço das técnicas de exames de imagem possibilitou o diagnóstico deste evento com maior facilidade, aumentando a incidência das dissecções das artérias viscerais. O tratamento clínico conservador, a revascularização cirúrgica, e a terapia endovascular são as três possíveis opções terapêuticas. Neste artigo, relatamos os casos de dois pacientes com dissecção espontânea do tronco celíaco conduzidos de formas diversas, de acordo com a apresentação clínica e exames de imagem, além de realizar uma revisão bibliográfica sobre esta doença.

Palavras-chave: tronco celíaco; dissecção espontânea; endovascular.

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INTRODUCTION

Spontaneous dissection of visceral arteries (SDVA) is a rare condition of the upper mesenteric artery, but it may also affect the celiac trunk, splenic artery and lower mesenteric artery[1-4]. Risk factors include atherosclerotic disease, hypertension, fribromuscular dysplasia, and stress, among others[5-10]. The exact etiology of dissection, however, remains unclear[4,5,11,12].

The most frequent symptom in patients with visceral artery dissection is abdominal pain, but patients may also have no symptoms, and may either refer or deny a history of pain in the epigastrium.[13-20] Technical advances and the growing use of imaging methods to investigate its etiology in patients with abdominal pain led to an increase in the incidence of the diagnosis of SDVA[2,21].

The best approach for the treatment of SDVA has not been fully defined because different clinical presentations and a small number of reports make it difficult to establish a uniform procedure. Conservative clinical treatment,[22-24] surgical revascularization[25-27] and endovascular repair[28,29] are the three possible treatment options.

This study describes two cases of spontaneous dissection of the celiac trunk (SDCT) treated as urgencies; it also discusses the treatments used and reviews current pertinent literature.

CASE 1

A 42-year-old man, with no comorbidities, presented with a strong and sudden pain in the upper abdomen for 3 days, together with sweating, nauseas, vomits and discrete abdominal distension, without any relief, but worsened by eating. His pain worsened at palpation of the epigastrium and right hypochondrium, but there were no signs of peritonitis. Laboratory tests did not reveal any abnormalities, and magnetic resonance imaging (MRI) of the abdomen revealed dissection with fusiform dilatation of the celiac trunk, with a diameter of 1.3 cm, and abnormal signal of adjacent adipose planes. Dissection extended to the splenic artery up to the splenic hilum, and also affected the hepatic arteries up to the intrahepatic branches (Figure 1).

Initial treatment was clinical, but there was no clinical improvement after 48 hours' follow-up. Visceral angiography confirmed the presence of dissection with a fusiform aneurysm of the celiac trunk. We chose selective catheterization of the origin of the celiac trunk, followed by aneurysm embolization using fibered coils and a self-expanding stent, from the left gastric artery to the origin of the celiac trunk. Angiographic follow-up showed that the aneurysmal sack was occluded and the patency of the left gastric artery was preserved (Figure 2).

The patient reported that pain improved on the first postoperative day and was discharged 4 days after the procedure. Four months later, computed tomography (CT) scans of the abdomen showed that the celiac trunk was pervious, the stent was well-positioned, and the coils were next to the proximal portion of the

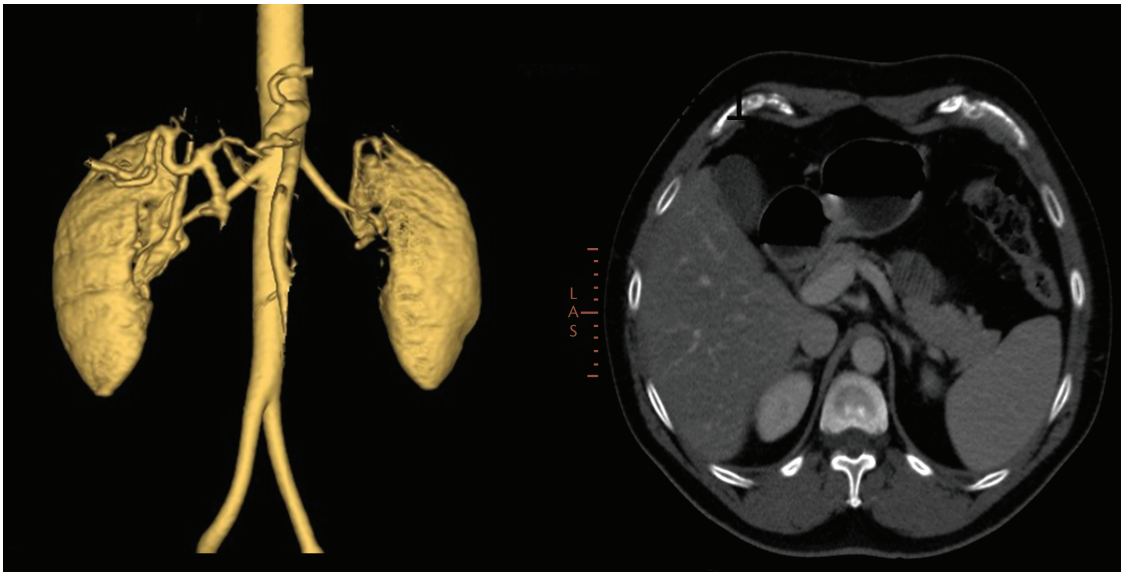

Figure 1. Abdominal CT scan: Reconstruction and axial view of celiac trunk dissection extending to common hepatic and splenic artery. Refilling of hepatic artery proper by gastroduodenal artery through superior mesenteric artery.

stent inside the aneurysmal sack, which underwent full embolization and thrombosis (Figure 3).

CASE 2

A 47-year-old man with hypertension presented with diffuse intermittent abdominal pain for 3 days and worsening in the last 48 hours. He had no other associated symptoms and no factors that might improve or worsen his condition. His pain worsened at deep palpation of the epigastrium and the mesogastrium, and there were no signs of peritonitis. Laboratory tests revealed that PCR was elevated (4.7 mg/L), but there were no other abnormalities. An abdominal CT scan revealed patency, ectasia and wall thickening of the celiac trunk and common hepatic artery, suggestive of intramural hematoma (Figure 4).

Angiography confirmed dissection originating in the celiac trunk with 30% narrowing of its lumen, and no hemodynamic signs of flow obstruction. Dissection extended to the proximal portion of

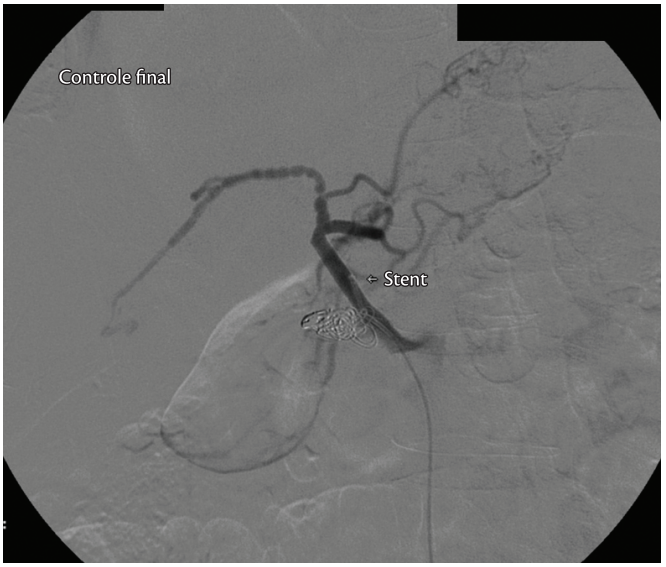

Figure 2. Digital subtraction angiography: Follow-up after embolization of aneurismal sack and stent implantation of left gastric artery to origin of celiac trunk.

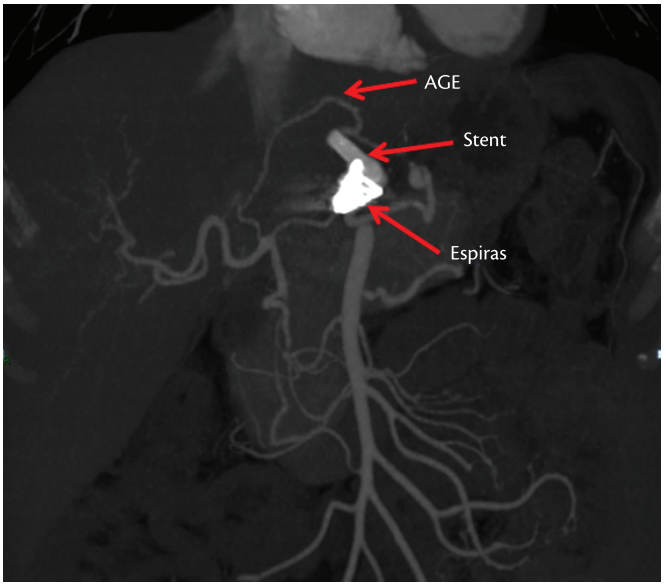

Figure 3. Abdominal CT scan: Coronal section of CT control shows adequate position of metal coils and stent, as well as patency of left gastric artery (LGA).

the common hepatic artery, but there were no hemodynamic changes in visceral flow. The treatment chosen was clinical, with the administration of oral anticlotting medication and blood pressure control. Ten days after hospitalization, abdominal pain had disappeared, and the patient was discharged with no symptoms.

Three months later, an abdominal MRI study showed that intramural hematoma had regressed and local stenosis of the affected local arteries had improved. Largest caliber of the celiac trunk was 1.4 cm, the same as the one found in the previous study.

DISCUSSION

Arterial dissection, defined as the separation of two layers of the arterial wall due to damage to the intimal layer or to a primary lesion of the vasa vasorum, leads to the formation of an intramural hematoma[13,14]. Spontaneous and isolated dissection of visceral arteries is an extremely rare event. The arteries most commonly affected by spontaneous dissection, excluding the aorta, are the renal, coronary, carotid, vertebral and, posteriorly, the visceral arteries[13]. Advances in imaging techniques and the frequent use of laboratory tests to explain the etiology of abdominal pain increased the incidence of the diagnosis of SDVA.

The difficulty in collecting reliable statistical data about SDVA incidence is assigned to symptom variability, as most patients have few or no symptoms. In symptomatic cases, abdominal pain is more frequent, although unspecific and not precisely located. There may also be nausea, vomits, postprandial abdominal pain and, in case of arterial rupture, symptoms typical of an acute hemorrhagic abdomen, in addition to hemodynamic shock and death[14].

The etiology of celiac trunk spontaneous dissection has not been defined, but atherosclerosis, uncontrolled hypertension, pregnancy, stress, fibromuscular dysplasia and cystic medial necrosis, as well as other congenital disorders of the vascular walls, are believed to be associated with its occurrence[5-10].

The diagnosis of symptomatic patients is made using imaging studies, such as abdominal ultrasound, CT or MRI. Abdominal ultrasound, a test that does not use iodated contrast and is available for most of the population, is valuable for diagnosis and patient follow-up, but results may be compromised due to the lack of intestinal preparation or bowel loop interposition. Abdominal CT with IV contrast is the best diagnostic and follow-up method because of its diagnostic sensitivity to identify visceral dissections, in addition to being rapid and noninvasive. Intimal delamination is pathognomic to dissection in the artery under evaluation. Other suggestive findings are celiac trunk aneurysm, wall thrombus, celiac trunk segmental stenosis and unspecific inflammatory infiltrate in fat adjacent to the vessel affected[5,18]. Abdominal MRI does not require iodated contrasts, has sensitivity similar to that of CT for lesions of the primary arterial branches and differentiates recent thrombi from chronic ones, but requires more time for its performance, has higher costs and is less accessible to the population. Visceral angiography is performed after the diagnosis is suggested by another imaging method, and it is used to plan the

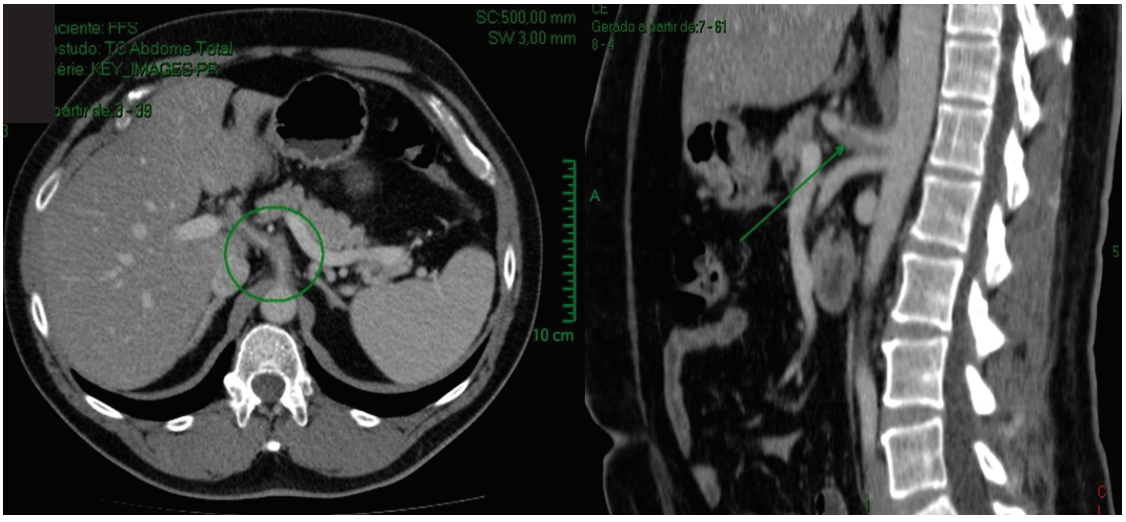

Figure 4. Abdominal CT scan: Axial and sagittal views show dissection layer in celiac trunk and patency of common hepatic artery.

treatment, evaluate arterial flow and determine whether the dissection extends to the branches of the artery affected. The angiographic study of the upper mesenteric artery is important because of the collateral circulation through the gastroduodenal artery, which may ensure the perfusion of the intrahepatic branches.

Conservative clinical treatment consists of the reestablishment and maintenance of blood pressure levels, hemodynamic support, parenteral hydration and, sometimes, fasting for patients with postprandial abdominal pain. Additionally, the use of platelet anti-aggregating agents, parenteral heparin or oral anticoagulants should be evaluated because they knowingly decrease the risk of thrombosis secondary to dissection. Recent studies showed that conservative clinical treatments are better in cases of superior mesenteric artery dissection without signs of acute intestinal ischemia[30]. However, there are no supporting data to indicate that this procedure should be used in cases of SDVA, or that these patients are free of complications resulting from the progression of the disease[31].

Conventional surgeries have been suggested for the treatment of SDVA that lead to ischemic or hemorrhagic complications, primarily in urgencies, which usually result in significant morbidity and mortality and prolonged recovery times. In general, resection of the arterial segment affected is followed, ideally, by revascularization of the celiac trunk branches, although origin ligature of these arteries has also been described in cases that pose technical difficulties or due to severity of patient condition. Abdominal aorta and renal artery are the main donor sites for revascularization of the celiac trunk branches. Another option is intimal repair and fixation, either followed or not by thrombectomy of the celiac trunk, although such procedures are supported by a few case reports.

Improvement of materials and techniques made endovascular repair the treatment of choice for many specialists in cases of visceral artery dissection, including the celiac trunk, mainly in high risk patients. The possibility of use of local anesthesia, with lower risk of adynamic ileus or abscesses and a faster recovery are some of the main advantages of the use of this method. Platinum coils, liquid embolization agents, such as glue (cyanoacrylate) and onyx and metal stents are some of the materials used. Platinum coils produce permanent thrombosis of the segment under treatment and may be released under control for accurate and safe positioning. They are often used to occlude the false lumen of the dissection or the vessel affected. Liquid embolization agents, such as glue and onyx, as well as platinum coils, may also be used to produce thrombosis of the false lumen. Coated or conventional vascular stents require favorable anatomic conditions, such as proximal and distal necks, as well as an adequate caliber. Their purpose is to correct possible stenosis due to compression of the false lumen, as well as to compress the dissected layers.

CONCLUSION

SDVA remains a rare disease, and the best treatment depends on clinical presentation and specific lesions identified by imaging studies. Clinical treatment remains the main indication in asymptomatic uncomplicated cases in which imaging methods do not detect lesions suggestive of severity. Conventional surgical treatment is indicated for unstable patients due to arterial rupture and hemorrhage, unfavorable anatomy for endovascular treatment or with signs of advanced splanchnic ischemia, such as necrosis or visceral perforation. Endovascular treatment should be the choice for patients with persistent symptoms or significant lesions detected using imaging studies. These patients should be followed up to evaluate the efficacy of the methods used.

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