

Case Report

Celiac Artery Stenosis: A Delayed Diagnosis of Chronic Abdominal Pain

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Celiac artery compression syndrome is defined as chronic abdominal pain that is related to compression of the celiac artery. Stenosis of the celiac artery has multiple etiologies, some common causes are median arcuate ligament syndrome, atherosclerosis, pancreatitis, local invasion by a malignancy and in many cases, it is idiopathic. In many cases of celiac artery compression, syndrome patients go undiagnosed for many years. Because of blood supply from the superior mesenteric artery, many patients with celiac stenosis may be asymptomatic. Patients with celiac artery compression syndrome report a wide range of postprandial pain in the epigastrium. However, may also present with weight loss, diarrhea, vomiting or decreased gastric emptying. We present the case of a 64-year-old male diagnosed in the emergency department with severe celiac artery stenosis whom reports over 30 years of postprandial pain. The patient underwent multiple tests and evaluation prior to arrival of the definitive diagnosis of this disease as the cause of increasing discomfort. After careful evaluation, the patient underwent balloon angioplasty with an uneventful post-operative course.

Keywords: Celiac Stenosis; Celiac Compression; Arcuate Ligament Syndrome; Chronic Abdominal Pain

Introduction

Celiac artery stenosis has been reported with an incidence of 12.5-24%. It is thought to be more prevalent in women compared to men (4:1 ratio) and more common in individuals between 40-60 years of age with thinner body morphology. The main etiological factor involved is median arcuate ligament compression, atherosclerosis, pancreatitis, tumor invasion or congenital abnormalities [1,2]. In western countries, atherosclerosis is more common as an etiology and in study groups in Japan the primary cause is arcuate ligament syndrome. Based on studies that have used Computer Tomography (CT) of the abdomen or arteriography, the incidence of asymptomatic celiac artery stenosis appears to be 7 percent with 50% attributable to median arcuate ligament compression [2]. Causes that induce celiac artery stenosis can be classified into three groups; extrinsic (median arcuate ligament syndrome, compression by celiac ganglion or surrounding fibrotic transformations), intrinsic (due to atherosclerosis) and other causes (including congenital malformations, acute or chronic disease, malignant invasion or compression due to chronic pancreatitis) [1].

Most patients with celiac artery stenosis leading to celiac artery compression syndrome experience abdominal pain. The abdominal pain degree varies widely but it correlates with the degree of stenosis. Patients with celiac artery stenosis remain asymptomatic for a long period as it is estimated that a reduction of 60-75% of arterial blood flow is needed to become symptomatic. Less than 1% of all abdominal arteriograms detect severe stenosis. An important factor that contributes to patients being asymptomatic despite >50% stenosis is the presence of collateral circulation via the mesenteric artery. Clinically significant ischemic bowel disease caused by celiac artery stenosis is rarely reported due to rich collateral circulation from the

Superior Mesenteric Artery (SMA). Major collateral pathways can be identified in patients with celiac artery stenosis [3]. These collaterals develop via the SMA to the hepatic, gastric and splenic branches that would otherwise be supplied directly from the celiac trunk in a normal patient. When the collateral circulation is no longer adequate or not well-developed symptoms may manifest.

History of Present Illness

64-year-old man with a past medical history of hypertension, hyperlipidemia, chronic abdominal pain with fecal incontinence and diarrhea was seen in the emergency room due to exacerbation of postprandial abdominal pain present for 30 years with worsening over the past 10 years. The pain is worse immediately postprandial. Gastroenterology whom performed a colonoscopy 2017 that was normal had seen the patient in the past. He was diagnosed at that time with overflow diarrhea and type 2 dysynergia, which had some improvement on subsequent follow up after physical therapy and biofeedback. The patient also had a CT of the abdomen and pelvis performed in 2008 that showed some celiac artery narrowing. The patient denied any weight loss and his weight on presentation correlated with a weight taken 18 months prior with a BMI of 28.2. The patient underwent laboratory testing that included Complete Metabolic Panel (CMP), Complete blood count CBC, Lipase levels and contrast CT scan in the emergency department. The CT scan showed severe celiac artery stenosis with no overlying mass effect. The patient was safely discharged and followed with both vascular surgery and gastroenterology for his symptoms and findings. Because the diagnosis of celiac artery compression syndrome requires vascular confirmation, imaging a subsequent arterial/Venous duplex of the mesenteric system was performed. These showed mildly

elevated velocities of the celiac artery at 231cm/s without post stenotic turbulence. This study also showed collateral vessels at the area of the celiac and mesenteric arteries. The hepatic, splenic and superior mesenteric arteries were otherwise normal. The patient also underwent upper gastrointestinal endoscopy that demonstrated mild inflammation at the gastric body and a 10mm sessile nodule with no bleeding. Subsequent biopsy showed reactive feveolar hyperplasia and mild gastritis of the antrum. Additional laboratory testing included ESR, CRP, ANA, CA 19-9, Hepatitis panel and CEA; all of which were within normal limits or negative. The patient also underwent cardiac exercise stress testing that demonstrated above average exercise tolerance at 105% of Maximal Predicted Heart Rate (MPHR) without reproduction of symptoms. Because of rarity and lack of specific symptoms, these test were needed to rule out other etiology for the patients symptoms. The patient underwent celiac artery balloon angioplasty without stetting with increased flow demonstrated intra-operatively. The patient remains asymptomatic 1-month post operatively.

Discussion

Celiac artery axis disease is defined as recurrent abdominal pain related to compression of the celiac artery by extrinsic factors; such as median arcuate ligament, compression from metastatic disease or intrinsic factors such as atherosclerotic disease. Celiac axis disease is a diagnosis only made after excluding other possible etiologies for chronic abdominal pain. For this reason, the time from patient onset of symptoms to diagnosis may be delayed. In one case, series the average duration of symptoms was 34 months before a diagnosis was made [4,5].

With regards to the anatomy of the celiac trunk, it originates between the 11th thoracic and first lumbar vertebra; with a higher origin along this axis correlating with a higher incidence for obstruction. The median arcuate ligament is a band of fibers passing over the abdominal aorta and connecting the diaphragmatic crura [4,6]. Most patients are asymptomatic but when symptomatic present with pain after eating and weight loss. Whenever the cause of the stenosis is an intrinsic one-ligament compression, enlarged celiac lymph nodes or fibro-inflammatory disease division of this structure provides relief. A study among a population of 990 patients, 2.3% was diagnosed with stenosis or occlusion of the proximal celiac trunk at a mean age of 58 years. The cause was mediate arcuate syndrome in 14 cases followed by direct invasion by pancreatic body tumor is six

cases, and chronic pancreatitis and arthrosclerosis in the remnant three cases. In all cases where the arcuate ligament was involved a higher origin of the celiac axis was also found [7].

When the cause is an intrinsic one minimally invasive intra-operative angioplasty with or without stetting can be performed. In one small case series 15 patients were treated laparoscopically, 4 underwent angioplasty. Symptoms improved in 3 of these patients with the rest only having relief after celiac artery bypass [6].

The main objective of celiac artery axis disease is the restoration of normal celiac axis blood flow [9]. It is usually a diagnosis of exclusion after ruling out more common causes of postprandial abdominal pain and weight loss, including peptic ulcer disease, gastro paresis, upper gastrointestinal malignancy and chronic pancreatitis.

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