

# MEDIAN ARCUATE LIGAMENT SYNDROME WITH POST STENOTIC PANCREATICODUODENAL ANEURYSM: CASE REPORT

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## ABSTRACT

**Background:** Median arcuate ligament syndrome (celiac artery compression syndrome, Dunbar syndrome) is an infrequent form of chronic mesenteric ischemia. The culprit for a sub optimal celiac blood flow is a low-positioned median arcuate ligament which is an arch of fibrous tissue connecting the diaphragmatic crura. Symptomatic patients complain of postprandial pain situated in the epigastrium. Still, most of the individuals proven to have some form of celiac artery compressions report no complaints at all. The gold standard for diagnosis is a CT angiography and treatment is surgical. The median arcuate ligament is transected with or without additional endovascular treatment.

**Case study:** We present the case of a 50-year-old male patient with a radiologically confirmed diagnosis of median arcuate ligament syndrome treated surgically at our institution. An open approach was used since the patient had a previous median laparotomy scar. Due to a post stenotic pancreaticoduodenal aneurysm coil embolization was additionally performed. On follow up the patient had no further complaints.

**Conclusion:** Patients with chronic postprandial pain require a systematic approach. In the differential diagnosis of abdominal angina, although uncommon, median arcuate ligament syndrome is to be remembered. The diagnosis is rather straightforward once clinical suspicion is established and treatment-wise minimally invasive surgery is performed whenever possible.

**KEYWORDS:** median arcuate ligament, chronic mesenteric ischemia, aneurysm, celiac artery compression syndrome

## INTRODUCTION

Median arcuate ligament syndrome, also called celiac artery compression syndrome or Dunbar syndrome is a rare form of chronic mesenteric ischemia. The median arcuate ligament is an anatomic structure situated behind the esophageal diaphragmatic hiatus (separating the aortic and esophageal hiatus) and it

is formed by the fibrous parts of the diaphragmatic crura [1–4]. When positioned low (10–24% of people) it can cause compression on the celiac artery resulting in impaired blood flow to the intestine in times of increased splanchnic demands, usually postprandially [5]. As a result, unintentional weight loss occurs. Younger women seem to be more susceptible to this pathology [2,5,6]. The diagnostic method of choice is computed tomographic (CT) angiography - this successfully shows a so called "hook" stenosis in the celiac artery with decreased flow of contrast material [4–5]. In some cases, a post-stenotic aneurysm occurs (due to high pressure - high velocity blood flow at the narrow and compressed part of the vessel) [7,8]. Treatment in symptomatic individuals is often surgical and consists of releasing the arcuate ligament by laparoscopy or open procedure, with or without celiac ganglion resection (thought to additionally relieve abdominal pain, although the latter is not overly supported by evidence) [7,9]. In long lasting disease histological changes in the vessel may occur and additional endoluminal stent placing may be necessary [9]. In the case of post-stenotic aneurysm, additional treatment by interventional radiology is also in order.

## CASE STUDY

A 50-year-old male patient was admitted to our Surgical Department through emergency care due to abdominal pain with radiological evidence of pneumoperitoneum. CT showed thickening of the jejunal wall and adjacent mesentery with a small amount of free air - the radiological finding was described as a perforation tectum. The CT also revealed an ill-defined tubular structure with axial dimensions of 2x1,7mm ventral to the head of the pancreas which was thought to be a vascular anomaly or aneurysm. Explorative laparotomy confirmed the radiology report and a partial jejunal resection with a latero-lateral anastomosis was performed. The vascular anomaly was not visualized intraoperatively.

The patient was released having had an uneventful hospital stay. Since complaints of postprandial pain continued during follow-up, an MSCT angiography

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was ordered which showed significant celiac stenosis with a post-stenotic pancreaticoduodenal aneurysm (21x16x16 mm). Median arcuate ligament was identified as the compression culprit and an elective surgery was scheduled. The patient already had a laparotomy scar, so we opted for an open procedure. The left hepatic lobe was mobilized and the diaphragmatic crura transected to gain access to the subdiaphragmatic aorta. The median arcuate ligament was released.

The intra- and postoperative course were uneventful, and the patient was released on the 4th postoperative day.

One month after the operation selective radiologic catheterization of the celiac trunk was performed. The aneurysm was situated at the transitioning part of the upper to lower pancreaticoduodenal artery. Coil embolization was performed. Control angiographic series showed a small celiac stenosis remnant, but since the patient had no more complaints of postprandial pain no further surgical or endovascular steps were undertaken.

## DISCUSSION

Chronic mesenteric ischemia is a diagnosis we are often prone to overlook for prolonged periods of time. Median arcuate ligament syndrome is a rare cause of celiac compression but fortunately confirming the diagnosis is rather straightforward and relatively easy to reach once clinical suspicion is established. CT angiography is readily available in most institutions and even a colour doppler ultrasound can facilitate the diagnostic course. Was suboptimal blood flow in the compressed celiac axis the cause for jejunal perforation in our patient? Studies show that patients with viable upper and lower mesenteric arteries (due to collateral blood flow) should not experience ischemic changes to the extent of bowel necrosis [10].

Bearing in mind that a large percentage of people (13-50%) may have an anatomically low-positioned arcuate ligament with angiographic signs of compression with absolutely no symptoms and complaints, the question is posed - where lies the importance of median arcuate ligament syndrome [5]? It is a diagnosis to think of in the patient with chronic abdominal torment where perhaps CT or endoscopy have showed no pathology and the subjective findings are disproportional to the physical ones.

## CONCLUSION

Patients with chronic postprandial pain require a systematic approach. Median arcuate ligament syndrome is a rare cause of abdominal angina, but diagnosis and treatment are easily accessible and usually successfully performed in a minimally invasive style

[4,11] The gold diagnostic standard is CT angiography and surgical treatment consists of median arcuate ligament release (laparoscopically where possible) - with or without additional endovascular procedures. Treatment is reserved for symptomatic patients.

## CONFLICT OF INTEREST:

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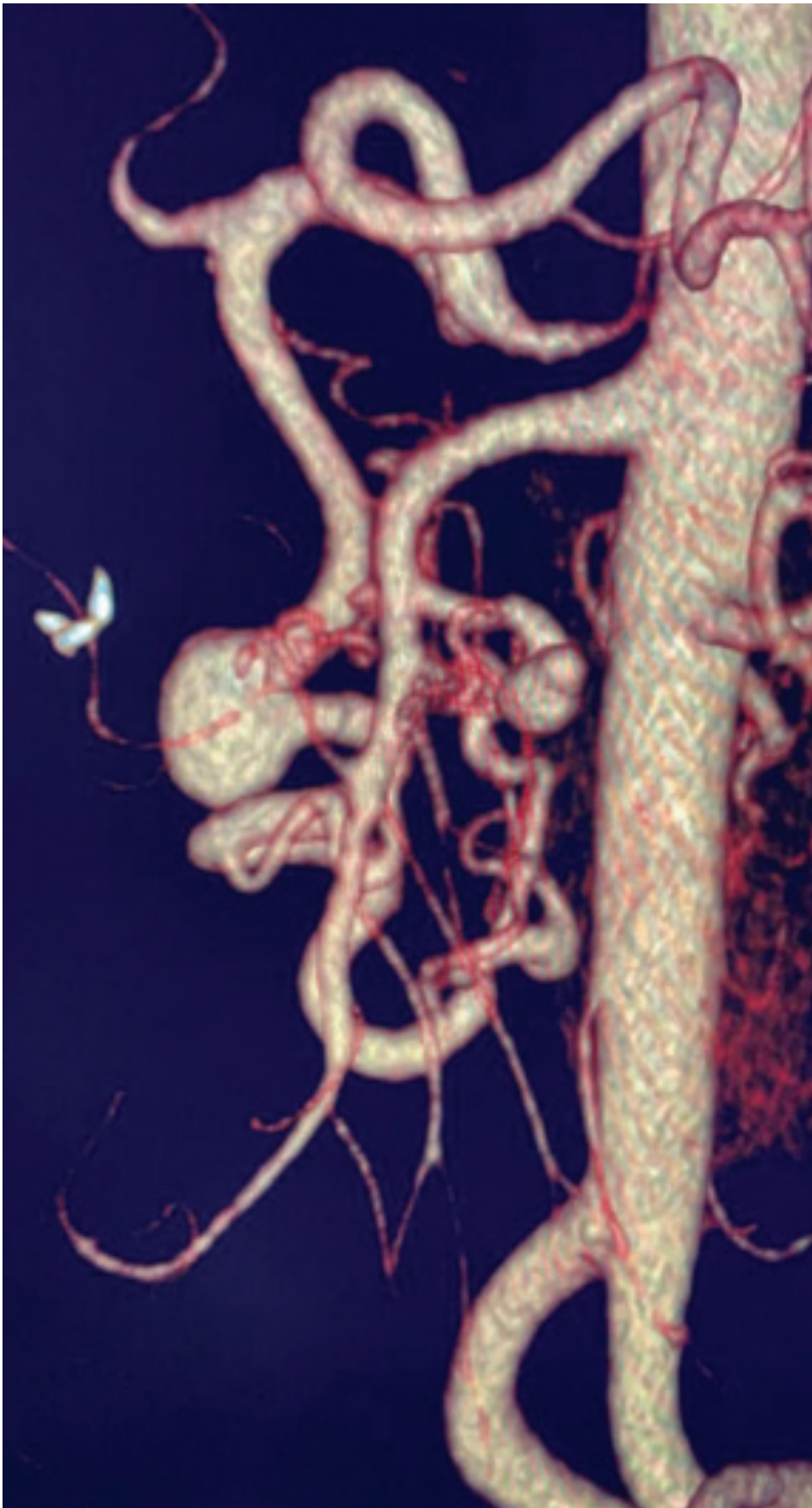
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**FIGURES**



**Figure 1.** Celiac trunk stenosis with a post stenotic pancreaticoduodenal aneurysm.