



Median Arcuate Ligament Syndrome complicated with Mesenteric Ischaemia : a case report

Samarasinghe S.U.D

Samarasinghe A.S

Chathuranga L.S

Perera J.

ABSTRACT

Median arcuate ligament syndrome (MALS) is a rare disease with compression of coeliac axis by fibrous attachment of diaphragmatic crus. It's a diagnosis by exclusion and generally presents with vague symptoms including postprandial abdominal pain, nausea, vomiting, and weight loss. Imaging of the vasculature helps in arriving at the diagnosis. Definitive treatment is by division of the compressing fibres by open or laparoscopic approach. We present a patient who developed mesenteric ischemia following a coronary artery bypass surgery (CABG) and found to have median arcuate ligament syndrome.

KEYWORDS : median arcuate ligament, coeliac axis, mesenteric ischaemia

Introduction

Median arcuate ligament is the condensation of the posterior edge of the diaphragm over the abdominal aorta at the aortic hiatus. Usually it lies above the origin of the coeliac axis. Abnormally low attachment results in bowel ischaemia due to compression of the coeliac trunk. Even though majority are asymptomatic 10-24% of the general population shows this anatomical abnormality.(1) Therefore median arcuate ligament syndrome has to be considered in a post CABG patient with symptoms of mesenteric ischaemia who already has compromised perfusion to the gut due to atheromatous plaques and perioperative hypotension.

Case presentation

A 73-year-old man underwent CABG and tissue valve replacement following myocardial infarction with severe mitral regurgitation. He has undergone routine aortic cannulation with a significantly longer pump time of 3 hours and 30minutes.

He was started on oral feeds on post-operative day zero once successfully extubated. He complained of vague abdominal pain and nausea which was worsened with oral intake. The following day he developed diarrhoea which was not blood stained. Detailed history revealed postprandial pain and discomfort during last 2 months which relieved after few hours. Mild tenderness noted in the epigastric region during abdominal examination. He was afebrile.

Full blood count showed normal neutrophil count while serum lactate remained normal. X-ray abdomen did not show dilated loops or free air. CT angiogram of the abdominal aorta revealed a high grade stenosis of the origin of the coeliac axis without atherosclerotic plaques. External compression was evident by the crus of the diaphragm. (figure1)

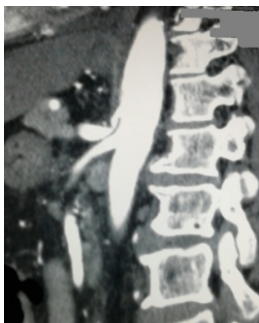


Figure 1: Coeliac artery is constricted at the origin due to the external compression by the diaphragmatic crus.

Patient was managed conservatively with nil by oral, antibiotics and close monitoring into basic parameters, as he was not suitable for open or laparoscopic surgical intervention due to non favourable cardiac status. He made a remarkable improvement in the following days and was started on liquids followed by solids in the post-op day 7.

Patient was discharged from the hospital with a plan of surgical correction of the constriction of the coeliac trunk once medically fit.

Discussion

External compression of the coeliac artery by the low lying diaphragmatic crus is the pathophysiological basis for the MALS. Narrowing is more during expiration. Severe compression occurs in only 1% of patients and more importantly persists during inspiration giving rise to symptoms.(6) Overstimulation of the coeliac ganglion may also contributed.(5) Compression of the artery leads to ischaemic gastroparesis(6) (causing nausea and vomiting) and midgut ischaemia due to steal syndrome from the superior mesenteric artery.(2)

MALS is also known as Dunbar syndrome or coeliac artery compression syndrome.(1)

Patients are usually young thin women.(2) Pain is located in the epigastric area and worsens after meals, with exercise, or with leaning forward. The pain is also associated with nausea, emesis, bloating, and diarrhea. Knee chest position may relieve their symptoms. A bruit in the epigastric region is detected in about 80% of the patients.

Although the diagnosis of MALS is traditionally made by using catheter angiography, other modalities like vascular scan and computed tomography (CT) angiography have gained popularity recently.

Surgical release of the median arcuate ligament is the mainstay of treatment. Laparoscopic approach has gained popularity recently. Removal of the coeliac ganglion with the release of the ligament has shown relief of symptoms in some series. Prolonged constriction leads to intimal fibrosis of the vessel necessitating vascular reconstruction. Decision to revascularise, is made depending on the intraoperative duplex scan to assess the distal flow described by Takach et al.(7) Percutaneous intervention with angioplasty and stenting has been described by Silva et al in a limited number of patients with good immediate results but long term data is sparse(4).

Conclusion

Even though, symptomatic median arcuate ligament syndrome is rare, compression of the coeliac artery due to low lying diaphragmatic crus is relatively common.(1) Symptoms of gut ischaemia in a post CABG patient who already has atherosclerotic arteries and possible perioperative hypotension has to be thoroughly investigated. Manifestation of symptoms of median arcuate ligament syndrome is highly likely in this category of patients. Surgical release of the compression results in relief of symptoms.

References

1. Duffy AJ, Panait L, Eisenberg D, Bell RL, Roberts KE, Sumpio B. Management of median arcuate ligament syndrome: a new paradigm. *Ann Vasc Surg.* 2009 Nov-Dec;23(6):778–784. Epub 2009 Jan 6.
2. A-Cienfuegos J, Rotellar F, Valenti V, et al. The celiac axis compression syndrome (CACS): critical review in the laparoscopic era. *Rev Esp Enferm Dig.* 2010 Mar;102(3):193–201.
3. Faries PL, Narula A, Veith FJ, Pomposelli FB, Jr, Marsan BU, LoGerfo FW. The use of gastric tonometry in the assessment of celiac artery compression syndrome. *Ann Vasc Surg.* 2000 Jan;14(1):20–23.
4. Silva JA, White CJ, Collins TJ, et al. Endovascular therapy for chronic mesenteric ischemia. *J Am Coll Cardiol.* 2006;47:944–50.
5. Reilly LM, Ammar AD, Stoney RJ, Ehrenfeld WK. Late results following operative repair for celiac artery compression syndrome. *J Vasc Surg.* 1985 Jan;2(1):79–91.
6. Tarun W, Dasari, Mazen S, Abu-Fadel, Jorge Saucedo. A case of median arcuate ligament syndrome; successful angioplasty and stenting. *Vascular disease management.* 2008 May;3(2):78–81.
7. Takach, T.J., Livesay, J.J., Reul, G.L. Jr, and Cooley, D.A. Celiac compression syndrome: tailored therapy based on intraoperative findings. *J Am Coll Surg.* 1996; 183:606–610