



MEDIAN ARCUATE LIGAMENT SYNDROME – A CASE REPORT

Radiodiagnosis

Dr. Rachna Chaurasia

Professor, Department of Radio-Diagnosis, M.L.B. Medical College, Jhansi.

Dr. Preeti Tiwari

Assistant Professor, Department of Radio-Diagnosis, M.L.B. Medical College, Jhansi.

Dr. Mohd. Faizan*

Junior Resident, Department of Radio-Diagnosis, M.L.B. Medical College, Jhansi.
*Corresponding Author

Dr. Pradeep Kumar Sharma

Junior Resident, Department of Radio-Diagnosis, M.L.B. Medical College, Jhansi.

ABSTRACT

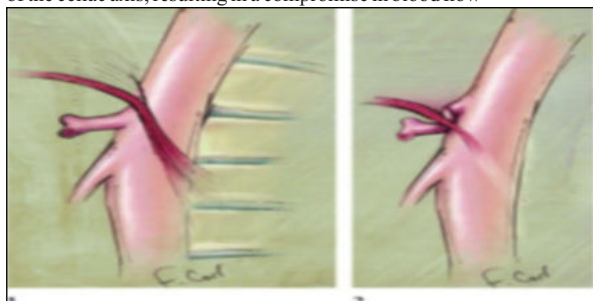
The median arcuate ligament passes superior to the origin of the celiac artery and is a continuation of the posterior diaphragm that wraps over the aorta. If it lies too low on the aorta, the ligament may cause compression of the celiac artery which may result in symptoms of abdominal pain classically diffuse post prandial pain.

KEYWORDS

Median Arcuate Ligament Syndrome, Narrowing/Stenosis of Celiac artery, CT angiography.

INTRODUCTION

The median arcuate ligament is a ligament under the diaphragm that connect the right and left crura of diaphragm on either side of the aortic hiatus. The ligament usually passes superior to the origin of the celiac artery near the first lumbar vertebra. However In 10-24% of people median arcuate ligaments occur low and passes in front of celiac artery, compressing the celiac artery. Few of these patients have hemodynamically significant stenosis that would cause symptoms. The diagnosis of clinically significant celiac axis compression, referred to as median arcuate ligament syndrome, We present the case of a patient with median arcuate ligament syndrome that caused post prandial abdominal pain associated with nausea, emesis, and bloating. The diagnosis is traditionally made with conventional angiography; however, the condition can now be diagnosed with computed tomographic (CT) angiography. In patients with median arcuate ligament syndrome, angiograms demonstrate a characteristic focal narrowing in the proximal celiac axis. The focal narrowing has a characteristic hooked appearance, which can help distinguish this condition from other causes of celiac artery narrowing, such as atherosclerotic disease. Once the disorder has been diagnosed, surgery can be performed to relieve the compression. CT angiography can play a role in the diagnosis of median arcuate ligament syndrome by demonstrating the characteristic focal narrowing of the celiac artery in patients presenting with the appropriate clinical symptoms. The definition of the syndrome relies on a combination of both clinical and radiographic features. It typically occurs in young patients (20 – 40 years of age) and is more common in thin women, who may present with epigastric pain and weight loss. The abdominal pain may be associated with eating, but not always. At physical examination, an abdominal bruit that varies with respiration may be audible in the mid epigastric region. Symptoms are thought to arise from the compression of the celiac axis, resulting in a compromise in blood flow



Figures 1, 2. Drawing from the sagittal perspective demonstrates the typical anatomy of the median arcuate ligament as it crosses anterior to the aorta and superior to the origin of the celiac axis. (2) Another sagittal view shows a normal variant anatomy in which the median arcuate ligament crosses the proximal portion of the celiac axis, causing an indentation.

CASE REPORT

A 30-year-old woman with no significant past medical history presented to the clinic with a 3-year history of intermittent epigastric abdominal pain. The pain was associated with nausea, nonbilious emesis, and bloating. The pain became worse when she ate fatty foods; the nausea worsened with any oral intake and relieved with bowel rest. Rarely she had rare diarrhea and also denied of the pain to any other locations in her body. She denied any alcohol intake, any illicit drug, or any tobacco product use. She had lost 7 kg over 3 years. Her physical examination revealed epigastric tenderness to palpation but no other abnormalities. Serum electrolytes, liver function test, kidney function test, amylase, lipase and complete blood counts were all within normal limits. Esophago-gastroduodenoscopy reveals no significant abnormality. Abdominal ultrasound performed and shows only contracted spleen with irregular margins. To exclude any vascular and mesenteric pathology CT angiography was performed.

TECHNIQUE USED:

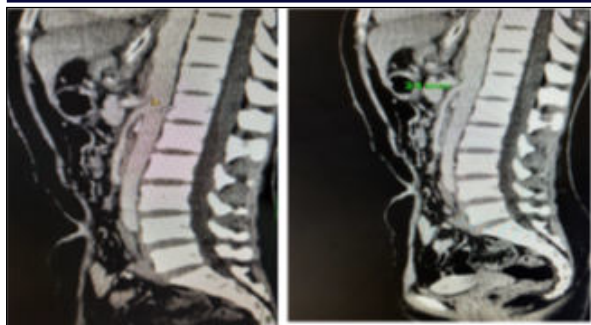
Patient was called in morning with proper 8 hour fasting. Patient received 500 to 800 ml of negative contrast to opacify the stomach and small bowel. Patient put in supine position. Peripheral venous access (20 G) is achieved in antecubital vein. 100 ml of iodinated contrast medium (Iohexol) is administered at a rate of 5ml/sec. Images are acquired in arterial phase at 30 sec. Images are obtained from above the level of diaphragm till the inguinal region. Images are obtained on a dedicated work station. Two dimensional multiplanar images, as well as rendering technique such as maximum intensity projection, surface shaded display, and volume rendering were acquired.

DISCUSSION:

Images were studied. Liver, gall bladder, pancreas, bilateral kidneys, urinary bladder, uterus, ovaries, stomach, small and large bowel appears normal. Spleen appears small and contracted (34.1mm) with irregular margins. On post contrast images almost all of the splenic parenchyma shows no enhancement s/o near complete infarct. However few patchy areas of splenic parenchyma shows normal enhancement s/o remaining normal splenic parenchyma.

Few spleniculi are also noted which shows normal enhancement (largest 12x9mm). Splenic artery shows relatively less contrast enhancement in comparison to other vessels with narrowing of caliber. There is focal narrowing (3.6mm) in diameter noted of superior aspect of proximal celiac trunk near its origin by compression of thick median arcuate ligament.

There is post stenotic dilatation of celiac artery measuring upto 8mm noted. There is no evidence of wall calcification or any thrombus or plaque noted. Keeping in mind all 2 dimensional (axial, sagittal and coronal) MIP, volume rendered images a diagnosis of median arcuate ligament syndrome causing subsequent near complete infarct of spleen is made.



Focal Narrowing Of Celiac Artery By Low Lying Median Arcuateligament



Volume Rendered Image Showing Hooked/j Shaped Appearance Of Proximal Celiac Trunk With Post Stenotic dilatation Caused By Median Arcuateligament Indenting Upon Superior Aspect Of Artery.



Small And Contracted Nonenhancing spleen

CONCLUSION:

Median arcuate ligament syndrome is a well established entity now. It is clear that the abnormally low insertion of the median arcuate ligament can be found in normal asymptomatic people. In a small subset of patients, however, the compression of the celiac axis can cause symptoms that may be relieved after surgical decompression. CT

angiography can play an important role in the diagnosis of this condition by demonstrating the characteristic focal narrowing of the celiac artery in patients presenting with the appropriate clinical symptoms.

REFERENCES

1. Chou SQ, Kwok KY, Wong LS, Fung DH, Wong WK. Imaging features of median arcuate ligament syndrome. *J Hong Kong Coll Radiol* 2010;13:101-3.
2. Ahmed A, Nazir R, Babar KS, Amin U. Identification of anomalous insertion of median arcuate ligament in asymptomatic individuals on multi detector computed tomography. *Gomal J Med Sci* 2015;13:143-5.
3. Lamba R, Tanner DT, Sekhon S, McGahan JP, Corwin MT, Lall CG. Multidetector CT of vascular compression syndromes in the abdomen and pelvis. *Radiographics* 2014;34:93-115.
4. Göyaa C, Hamidia C, Hattapoğlu S, Çetinçakmak MG, Teke M, Kudaya S. Diagnosis of median arcuate ligament syndrome on multidetector computed tomography. *J Med Cases* 2013;4:616-9.
5. Youssef AT. Evaluation of asymptomatic patients with median arcuate ligament syndrome (MALS) using color duplex ultrasound and computed tomographic (CT) angiography. *Am J Cardiovasc Dis Res* 2013;1:7-11.
6. Fong JK, Poh AC, Tan AG, Taneja R. Imaging findings and clinical features of abdominal vascular compression syndromes. *AJR Am J Roentgenol* 2014;203:29-36.
7. Horton KM, Talamini MA, Fishman EK. Median arcuate ligament syndrome: Evaluation with CT angiography. *Radiographics* 2005;25:1177-82.
8. Hongsakul K, Rookkapan S, Sungsirij J, Tuntawee T. A severe case of median arcuate ligament syndrome with successful angioplasty and stenting. *Case Rep Vasc Med* 2012;2012:129870.
9. Karahan OI, Kahrman G, Yikilmaz A, Ok E. Celiac artery compression syndrome: Diagnosis with multislice CT. *Diagn Interv Radiol* 2007;13:90-3.