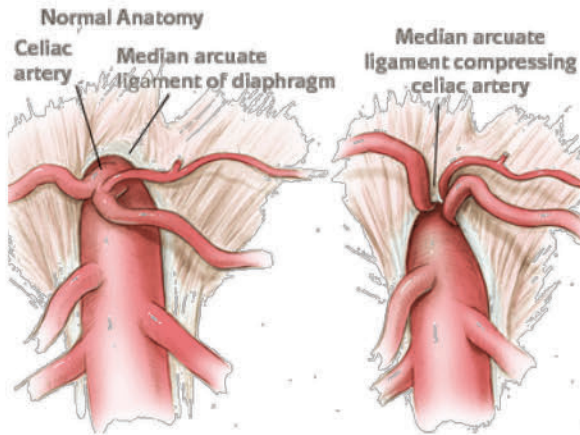


What causes MALS?

MALS is a congenital anatomic anomaly, meaning it is a structural aberrance present at the time of birth. In MALS patients, the diaphragm is too low, causing the median arcuate ligament to compress the celiac artery. This compression also affects the nerves of the celiac ganglion, a bundle of sensory nerves located in the same area. The pressure on the artery may cause a change in blood flow, while the pressure on the nerves causes them to become inflamed and send pain signals to the brain. Over time, the inflammation increases, and the nerves are chronically activated. Patients are often unable to eat due to pain/nausea and many lose weight.



Symptoms of MALS include:

- Pain after eating
- Fatigue after eating
- Nausea/vomiting
- Weight loss
- Constipation/diarrhea

Where is the pain?

Pain in MALS patients is located between the ribs and below the sternum. Pain can also radiate into either flank or back. Pushing on this area will increase the pain.

Surgical Process

Variations in Procedures

MALS was first diagnosed and recorded in the 1940s, and between 1963 and 2012, a total of less than 500 surgeries were performed. This means MALS is still a nascent diagnosis, and treatment continues to evolve. Because of this, there is often a great deal of variation between surgeons and the procedures they perform. It is therefore crucial for the patient to research those who treat MALS to find an experienced doctor and treatment plan that is right for them.

For More Information

Dr. Richard C. Hsu is a board certified general and vascular surgeon, who is known for the rapport he establishes with his patients and fellow providers. He is recognized as a leader in the management of MALS. You can contact his office, The Vascular Experts, at 844-482-7285.



Median Arcuate Ligament Syndrome

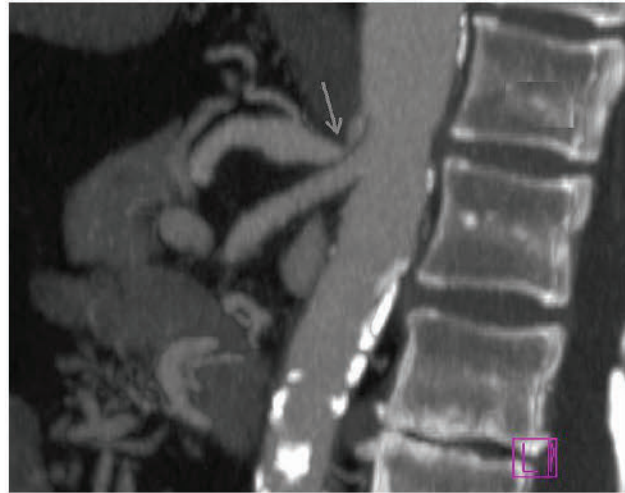
Finding the Cause of Persistent Inexplicable Epigastric Pain



Median Arcuate Ligament Syndrome (MALS) is a congenital anatomical anomaly found in 15% of the population. Of that, less than 1% experience symptoms.



Testing and Diagnosis



Because MALS patients present with gastrointestinal symptoms, they often go through a battery of GI tests, including EGDs, gastric emptying tests and colonoscopies. Often these tests show no abnormality, so many patients are referred for psychological evaluations or to eating disorder clinics, because doctors can find no physical cause for the pain. The anatomy for MALS can be seen on an abdominal CT scan. A mesenteric duplex or MRA can also be used, although these are less specific tests. Other diagnostic criteria required for diagnosis include physical examination findings consistent with inflamed celiac ganglion, and a celiac ganglion block to confirm a neurogenic cause of pain.

Common Misdiagnosis

Most doctors don't know about it, so MALS is underdiagnosed. Differential diagnoses for epigastric pain include gastroparesis, eating disorders, or IBS.

Tests necessary to diagnose MALS:

- Abdominal CT with IV contrast
- Physical exam
- Celiac Ganglion Block

Vascular vs Neurologic

Because the median arcuate ligament is compressing both the celiac artery and the celiac ganglion nerves, there is debate as to whether the cause of pain is vascular (caused by blood flow) or neurologic (caused by the nerves).

Many doctors believe MALS is a vascular issue—however, this does not explain the pain patients feel, nor does it address those patients who continue to suffer despite having adequate blood flow through the celiac artery.

Those who believe MALS is a neurologic issue focus on the celiac ganglion as the main cause of a patient's symptoms. Because of the pressure on the nerves, they have become inflamed beyond the point of repair. These inflamed nerves must be addressed to resolve the patient's disabling pain.

Treatment

MALS can be treated with surgery, either open or laparoscopic. In a laparoscopic procedure, the median arcuate ligament is released, which removes pressure from the artery. However, the celiac ganglion cannot be removed during a laparoscopic procedure, so if the nerves are inflamed and causing pain, they will continue to do so even after the pressure has been removed.

In an open procedure, the surgeon resects the median arcuate ligament and removes the celiac ganglion nerves. Resection of the inflamed nerves has been shown to help reduce or completely eliminate the pain in over 90% of patients.