

# A Novel Approach of Intravascular Ultrasound-Guided Laparoscopic Median Arcuate Ligament Release

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**Background:** Median arcuate ligament syndrome (MALS) is a rare condition that can have a significant impact on quality of life. Diagnosis is difficult and delayed due to the need to exclude other pathologies. Treatment strategies involve open or laparoscopic division of the median arcuate ligament, with or without vascular reconstruction. We describe a novel hybrid technique using intravascular ultrasound (IVUS) technology to guide laparoscopic median arcuate ligament division, which has never been previously published in the literature.

**Method:** Our patient is a 42-year-old who was found to have MALS complicated by previous coeliac axis thrombosis and splenic infarct. She presented with worsening post-prandial abdominal pain and weight loss. Digital subtraction angiography (DSA) demonstrated an occluded coeliac axis due to compression.

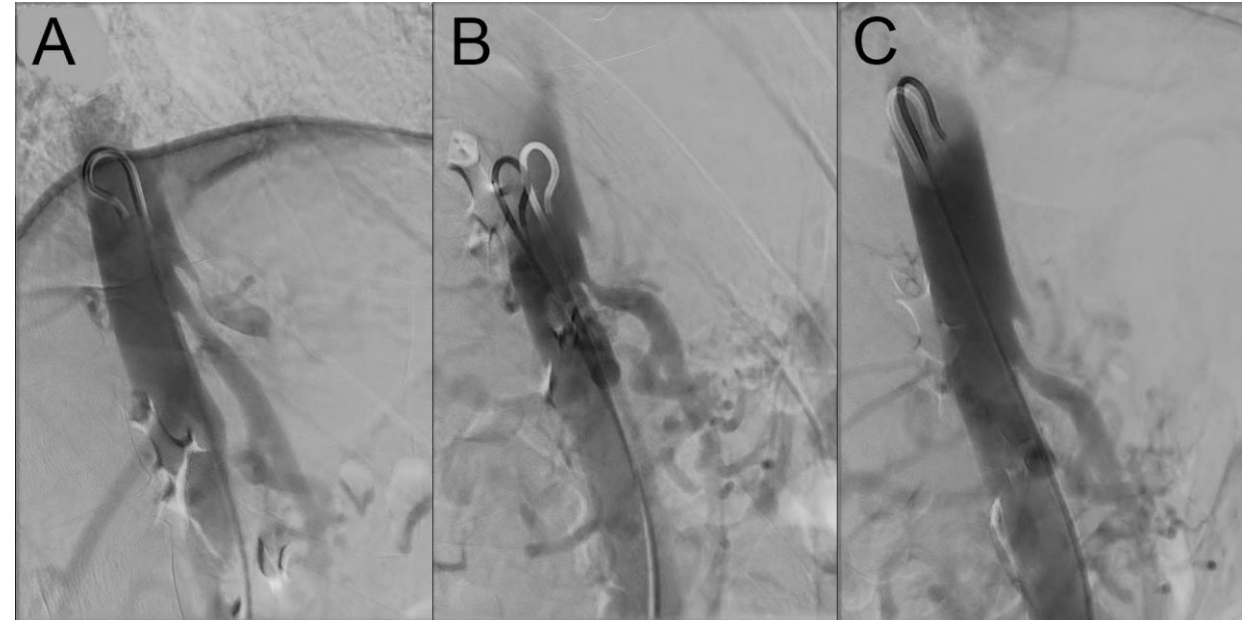
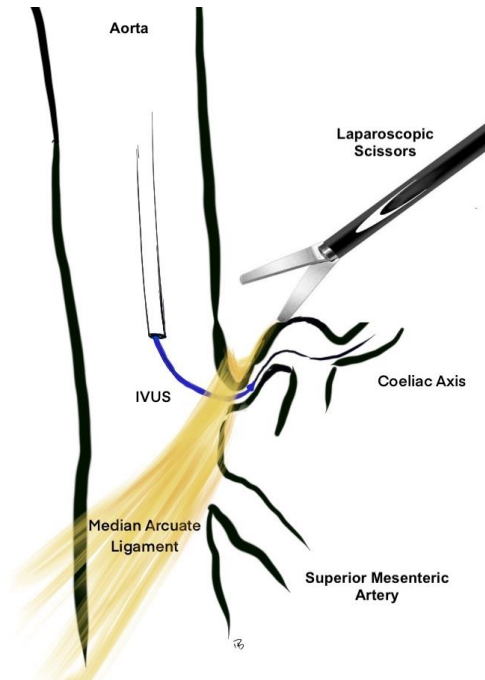


Image 1. DSA of the aorta and mesenteric arteries. (A) Significant stenosis of coeliac artery with deep inspiration. (B) Occlusion of coeliac artery and >50% stenosis of with deep expiration. (C) Occlusion of coeliac artery and 50% stenosis of SMA with normal respiration.

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**Results:** The use of IVUS significantly helped to guide laparoscopic division of the median arcuate ligament. It allowed for precise localisation of the point of compression and provided real-time feedback regarding the intraluminal effects of the release. Additionally, it demonstrated immediate confirmation of successful decompression. The patient later proceeded to have endovascular stent insertion in her coeliac artery. Her symptoms resolved following this procedure.

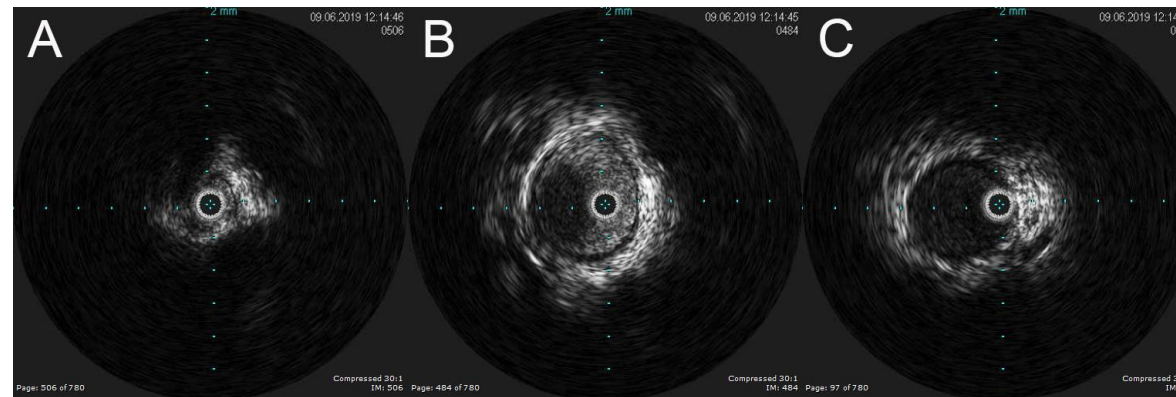


Image 2. Schematic illustrating technique of laparoscopic release of MAL using IVUS guidance.

Image 3. IVUS images of the coeliac artery (A) At point of coeliac artery occlusion. (B) Immediately distal to occlusion, there is an area of slow vascular flow/thrombus. (C) Post-stenotic dilatation.

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**Conclusion:** MALS is a distressing and debilitating condition. IVUS technology allows for real-time guidance of laparoscopic release of the median arcuate ligament. This, coupled with endovascular reconstruction, presents a hybrid, minimally invasive approach to the treatment of MALS.

Image 4. (A) DSA showing position of a 7x19mm Omnilink Elite balloon-expandable stent within origin of coeliac artery. (B) DSA post stent insertion demonstrating a widely patent coeliac artery and excellent perfusion of distal organs despite a degree of vasospasm of the common hepatic artery.

