Our Experience on Median Arcuate Ligament Release

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NO DISCLOSURES
Median Arcuate Ligament Syndrome (MALS)

- MALS is usually a diagnosis of exclusion
- Symptoms: chronic postprandial abdominal pain, nausea, vomiting, and involuntary weight loss.

Pathophysiology

- Compression of the celiac artery (CA) and plexus by the diaphragm crura.
  
  1) Compression of CA causing bowel ischemia.
  
  2) Compression of the celiac plexus causing neurogenic pain.
Approach Algorithm
Diagnosis

Diagnostic images:
• CTA/MRA:

Inspiratory/Expiratory testing:
• Inspiratory and expiratory angiogram:
• Novel technique SMA cannulated and vasodilator drug injected during angiography.
• Duplex ultrasound: operator dependence.

Physiologic testing
• Gastric Tonometry: before, during and after exercise.
• Ganglion nerve block
Treatment

Surgical release of the MAL.
• Open decompression
• Reconstruction
• Laparoscopic
• Robotic-assisted
• Endovascular intervention

Fig 2. A, Intraoperative photograph shows the laparoscopic approach to the celiac axis. B, Laparoscopic division of median arcuate ligament (MAL) fibers. Note celiac stenosis and poststenotic dilatation (arrow).
Outcomes and Patient’s Satisfaction with MALS release
Study Design

• Objective: review outcome of laparoscopic MAL release surgery for treatment of MALS
• A single academic center retrospective review between NOV 2011 and DEC 2018.
• 14 patients, initially laparoscopic release of MALS.
Study Design

• EMR: demographics, diagnostic modality, perioperative outcome.

• A Phone interview follow-up: patient satisfaction, symptom improvement, weight gain.
### Results

<table>
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<tr>
<th>Patient's N.</th>
<th>Age</th>
<th>Sex</th>
<th>Initial BMI</th>
<th>Comorbidities and/or past medical history</th>
<th>Previous abdominal surgeries</th>
<th>Diagnostic tools</th>
<th>Response to procedure</th>
<th>Adjuvant Procedure</th>
<th>Follow up BMI</th>
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<td>F</td>
<td>21.67</td>
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<td></td>
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<td>2</td>
<td>58</td>
<td>M</td>
<td>16.08</td>
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<td></td>
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<tr>
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<td>CTA, Angio</td>
<td>+ celiac stent</td>
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Results

Age: mean 43 (18-65)

Gender (4:1)

Gender

Female: 71.4%
Male: 28.6%
Results

• EBL: Mean 306.79 (5-3000)
• Operative time: Mean 110.50 (79-258)
• Intraoperative complication/Converted open/infection related to procedure: 1 (7.1%): due to aortic rupture.
• Length of hospital stay: Mean 5.07 (0-36)
Technical Success

- Technical Success: 78.6%
- Needed Adjunctive procedures: Celiac Stenting
- Failure of laparoscopic release, needed to be converted to open after aortic rupture
- STS: 14.3%
- Failure: 7.1%
Symptom Resolution

Postop

- Relief: 78.6%
- Improvement: 21.4%
- No: 0%

Follow up phone interview

- Relief: 70%
- Improvement: 20%
- No: 10%
- Lost at FU: 10%

(Bar charts showing symptom resolution and follow-up results)
Results Phone Interview

Weight Gain (subjective)

Weight Gain

<table>
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<tr>
<th>Yes</th>
<th>Partial</th>
<th>Lost FU</th>
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<td>70%</td>
<td>30%</td>
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</table>

Patient’s Satisfaction

Would you have the surgery again?

<table>
<thead>
<tr>
<th>Yes</th>
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<th>Lost FU</th>
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Did not answer the phone!!!
Conclusion

• 1 patient that did symptoms did not improve: due to underlying inflammatory bowel disease.
• Our approach consists on releasing the ligament and transecting the plexus laparoscopically. If symptoms recur due to residual compression of the celiac, we proceed with celiac stenting.
• **Laparoscopic MALS surgery is a safe and viable treatment option, with high patient satisfaction and symptom improvement.**
• Future studies: Larger patient sample, multiple centers, examining multiple techniques.
Acknowledgement

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