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# Celiac Peri-ganglionic Fibrosis Assessment in Median Arcuate Ligament Syndrome: Correlation with Post-operative Clinical Outcomes

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Orlando, FL – April 23-26

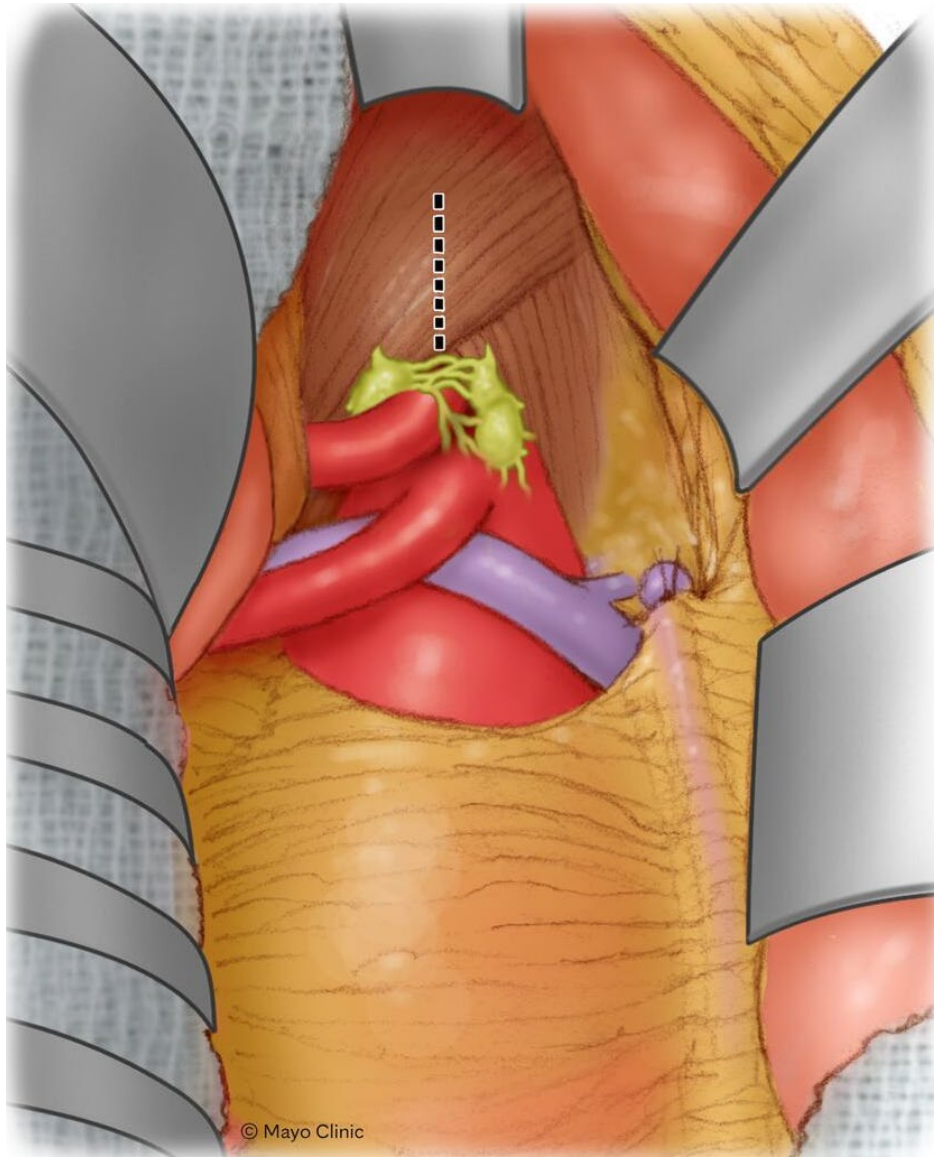
# DISCLOSURES

- None

# BACKGROUND

- Median arcuate ligament syndrome (MALS) is a condition in which the median arcuate ligament (MAL) compresses the celiac axis region.
- MALS is historically related to the compression of the celiac artery.
- However, recent evidence showed that chronic compression of the celiac plexus may be the primary driver of symptoms.



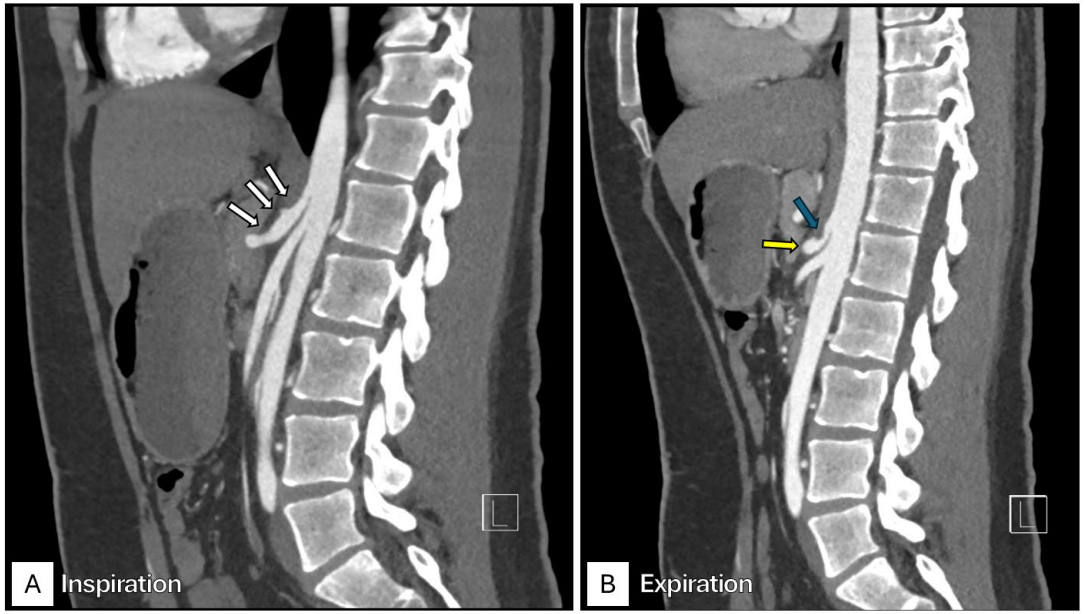

 

# PRESENTATION

- This compression leads to a constellation of foregut ischemia-like symptoms, including:
  - Postprandial abdominal pain
  - Unintentional weight loss
  - Food fear
  - Nausea and vomiting

  } MALS triad

- These symptoms may reflect a combination of vascular insufficiency and/or neurogenic irritation rather than arterial narrowing alone.
- This helps explain why imaging severity does not always match symptom severity.



# STUDY RATIONALE

- MALS pathophysiology remains poorly understood.
- Recent evidence shows inflammation and fibrosis in celiac ganglia, but comprehensive histopathology data is still limited.
- We therefore evaluated whether the degree of fibrosis around the celiac ganglion correlates with postoperative improvement in symptoms after MAL release and celiac ganglionectomy.
- Aim: To determine whether the degree of fibrosis around the celiac ganglion correlates with symptoms severity.

# METHODS

- A retrospective single-institution review in patients who underwent MAL release combined with celiac ganglionectomy.
- Time period: 2015-2024.
- Tissue analysis:
  - Resected celiac ganglions were formalin-fixed, H&E-stained, and digitally scanned.
  - Assessed the presence of ganglion cells.
  - Thickness of peri-ganglionic fibrotic tissue was measured digitally.
- Postoperative clinical outcomes, including abdominal pain and nausea improvement, were recorded and correlated with fibrosis measurements.

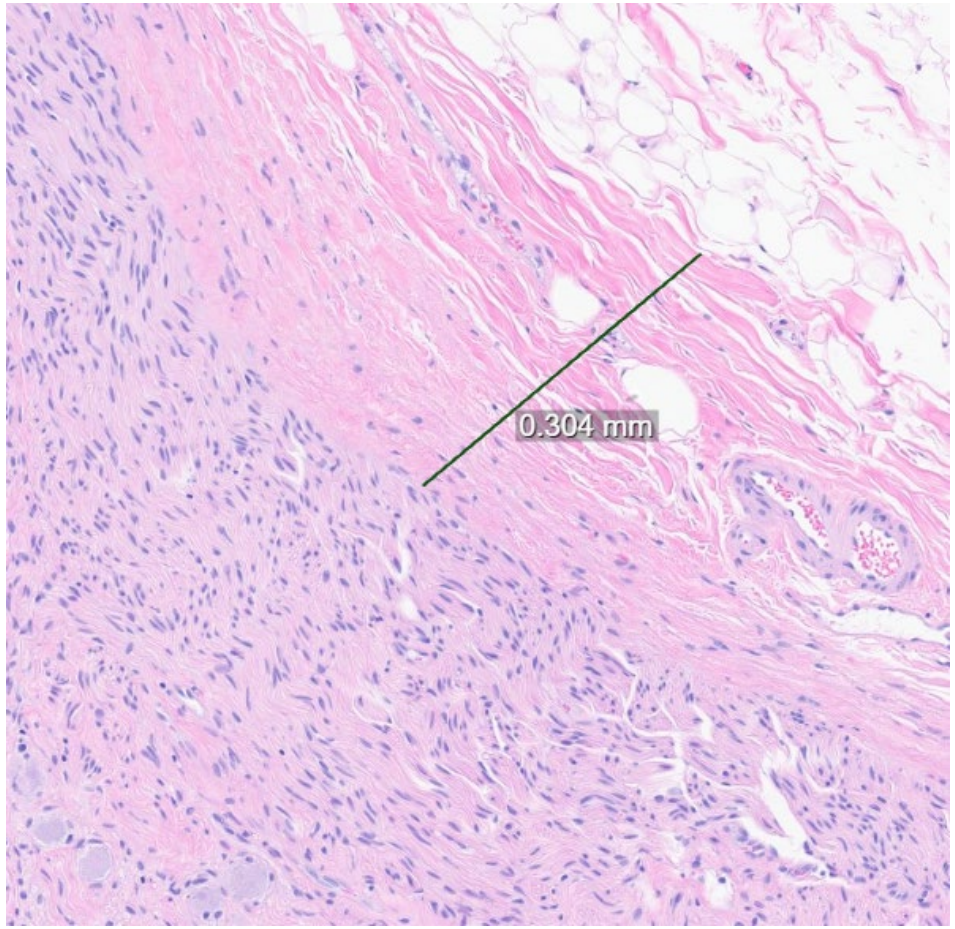
 

# RESULTS

**30**
Total Patients Diagnosed with MALS

→

**70%**
Had Fibrosis Present in Specimens




Peri-ganglionic fibrosis thickness

- **Mean**: 0.21 (0.14)
- **Median**: 0.18 (0.11, 0.26)

# RESULTS

| | No Fibrosis (N=9) | Fibrosis (N=21) | p value |
|---|---|---|---|
| Age | | | 0.469 |
| - Mean (SD) | 42.111 (17.864) | 36.952 (15.028) | |
| - Median (Q1, Q3) | 44.000 (28.000, 51.000) | 32.000 (24.000, 48.000) | |
| BMI | | | **0.03** |
| - Mean (SD) | 20.811 (1.837) | 23.723 (4.048) | |
| - Median (Q1, Q3) | 20.700 (19.900, 20.900) | 23.278 (21.000, 26.253) | |
| Hospital LOS | | | 0.398 |
| - Mean (SD) | 2.000 (1.581) | 1.619 (1.071) | |
| - Median (Q1, Q3) | 2.000 (1.000, 2.000) | 1.000 (1.000, 2.000) | |
| Last follow up (days) | | | 0.7 |
| - Mean (SD) | 75.778 (72.729) | 112.905 (165.849) | |
| - Median (Q1, Q3) | 40.000 (29.000, 88.000) | 34.000 (28.000, 110.000) | |
| Sex | | | 0.593 |
| - Female | 7 (77.8%) | 18 (85.7%) | |
| - Male | 2 (22.2%) | 3 (14.3%) | |
| Previous GI surgery | 3 (33.3%) | 7 (33.3%) | 1 |
| Depression | 3 (33.3%) | 9 (42.9%) | 0.626 |
| Anxiety | 3 (33.3%) | 8 (38.1%) | 0.804 |

# RESULTS

| | No Fibrosis (N=9) | Fibrosis (N=21) | p value |
|---|---|---|---|
| Abd Pain postprandial | 8 (88.9%) | 16 (76.2%) | 0.426 |
| Abd pain exertional | 2 (22.2%) | 5 (23.8%) | 0.925 |
| Abd Pain unprovoked | 6 (66.7%) | 10 (47.6%) | 0.338 |
| Nausea | 4 (44.4%) | 12 (57.1%) | 0.523 |
| Vomiting | 1 (11.1%) | 2 (9.5%) | 0.894 |
| Constipation | 2 (22.2%) | 2 (9.5%) | 0.348 |
| Diarrhea | 1 (11.1%) | 2 (9.5%) | 0.894 |
| Weight loss | 6 (66.7%) | 16 (76.2%) | 0.589 |
| GI screening | 9 (100.0%) | 20 (95.2%) | 0.506 |

# RESULTS

| | No Fibrosis (N=9) | Fibrosis (N=21) | p value |
|---|---|---|---|
| Abd Pain Resolution | | | 0.257 |
| • Worsened | 1 (11.1%) | 0 (0.0%) | |
| • unchanged | 2 (22.2%) | 6 (28.6%) | |
| • improved | 5 (55.6%) | 8 (38.1%) | |
| • resolved | 1 (11.1%) | 7 (33.3%) | |
| Nausea Resolution | | | 0.605 |
| • Worsened | 1 (11.1%) | 1 (4.8%) | |
| • unchanged | 2 (22.2%) | 10 (47.6%) | |
| • improved | 4 (44.4%) | 7 (33.3%) | |
| • resolved | 2 (22.2%) | 3 (14.3%) | |
| Narcotic use at F.U | | | 0.533 |
| • None | 6 (66.6%) | 15 (71.4%) | |
| • Decreased | 0 (0.0%) | 1 (4.8%) | |
| • Unchanged | 1 (11.1%) | 3 (14.3%) | |
| • Increased | 2 (22.2%) | 2 (9.5%) | |

# RESULTS

| **Abdominal Pain Improvement** | **No (N=9)** | **Yes (N=21)** | **p value** |
|---|---|---|---|
| Measurement of Fibrosis | | | 0.281 |
| Mean (SD) | 0.23 (0.12) | 0.21 (0.20) | |
| Median (Q1, Q3) | 0.19 (0.16, 0.30) | 0.16 (0.10, 0.30) | |
| **Nausea Improvement** | **No (N=14)** | **Yes (N=16)** | **p value** |
| Measurement of Fibrosis | | | 0.839 |
| Mean (SD) | 0.20 (0.12) | 0.23 (0.18) | |
| Median (Q1, Q3) | 0.16 (0.12, 0.23) | 0.19 (0.10, 0.25) | |

# LIMITATIONS

- Retrospective design.
- Limited cohort.
- Variable specimen quality due to difficulty in reliably identifying celiac ganglion tissue intraoperatively.

# CONCLUSION

- Degree of celiac peri-ganglionic fibrosis showed no correlation with postoperative outcomes.
- Similar symptom relief achieved regardless of fibrosis extent.
- Fibrosis alone did not explain clinical presentation or postoperative outcomes in MALS.

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# THANK YOU

**Division of Vascular and Endovascular Surgery.**

Houssam Farres, MD.
Young Erben, MD.
Christopher Jacobs, MD.
Camilo Polania, MD.
Camila Esquetini, MD.
Adeeb Jlilati, MD.
Diego Sanchez, MD.
Ekin Inal, MD.

Orlando, FL – April 23-26