

Intraoperative Functional Luminal Imaging to Assess Esophagogastric Junction Distensibility during Per-Oral Endoscopic Myotomy in Pediatric Patients

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Per-oral Endoscopic Myotomy (POEM) is a transmural endoscopic surgical technique that is gaining widespread adoption in the management of adult achalasia. The endoscopic approach offers excellent access to the muscular wall of the esophagus enabling division of the abnormal circular fibers. The procedure offers the benefits of being incisionless, preserving the outer longitudinal esophageal muscle fibers and avoiding medication.

| | | |
|---|------|------|
| Post-POEM minimum diameter (mm) | 8.7 | 8.1 |
| Post-POEM minimum Cross Sectional Area (mm ²) | 59 | 52 |
| Post-POEM Distensibility (mm ² /mmHg) | 2.63 | 2.47 |

Table 1: Pediatric POEM Cases; All values at 30ml filling mode.

While the current patients did not reach the EG junction distensibility mark of 2.9 set by Rohof [14] their symptoms were resolved and they have not developed any recurrence. The 2.9 cutoff

was developed using a cohort of healthy adults (40 ± 41 years). Additional studies in adults measuring distensibility pre- and post-POEM (Table 2) have much higher post distensibility (8.2 ± 3) [15]. The patients in these studies did have slightly higher pre distensibility (1.8 ± 1.1). There may be fundamental differences in the distensibility of adults and children past the physical size or space such as tissue plasticity. Studies in children with larger samples and a healthy baseline will be needed to establish age specific recommendations [16-18]. Long-term EndoFLIP imaging in POEM patients may also help explain the differences observed.

| DUh]Ybh | F]YXYf`Yh`U`**0%*Q | HY]hY`VU i a `Yh`U`**0%)Q | HY]hY`VU i a `Yh`U`**0%+Q | JYf`UUb`Yh`U`**&\$%`'0%,Q |
|--|------------------------|---------------------------|---------------------------|---------------------------|
| Number of POEM Patients | 4 | 14 | 19 | 10 |
| Age (in years) | 64 17 | 48 15 | 49 16 | 43 (IQR 31-66) |
| Pre-POEM Eckardt score | | 7 2 | 7 2 | 8 (IQR 4-8) |
| Pre-POEM Distensibility (mm ² /mmHg) | 0.8 (0.7-1.0) | 1.8 1.1 | 1.8 1.4 | 1.0 (IQR 0.8-1.5) |
| Post-POEM Measure | Immediately after POEM | | | 3 months after POEM |
| Post-POEM Eckardt score | | Not reported | Not reported | 1 (IQR 0-1) |
| Post-POEM Distensibility (mm ² /mmHg) | 3.1 (Range 1.7-3.4) | 8.2 3 | 9.3 4.1 | 2.9 (IRQ 1.3-19.6) |

