High-resolution Esophageal and Anorectal Manometry

When To Do It And How Does It Help?

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Clinical Indications for Esophageal Manometry

Evaluate esophageal dysphagia and/or chest pain after excluding causes other than motor disturbance

Establish the diagnosis of achalasia

Evaluate esophageal involvement by connective tissue diseases

Determine LES location for placement of ambulatory pH probe

Evaluate motor function prior to fundoplication

Evaluate dysphagia in the postoperative setting
Standard manometry

Conversion to 3D space
3D recording from 36 sensors at 1 cm intervals
3D recording with color assigned to pressure

High-resolution pressure topography of normal esophageal function
High-resolution pressure topography of normal esophagus at rest

Type I

Type II

Type III

Distance from Nares (cm)

mmHg
Fig 8

Achalasia Subtypes

Type I

Type II

Type III
Response to Balloon Dilation vs Lap Heller as a Function of Achalasia Subtype

Types III Achalasia not Well Treated by Balloon Dilation

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Esophagogastric outlet obstruction

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Distal Latency and Esophageal Spasm

Distal contractile integral

DCI = 1539 mmHg s cm
**MM is a 25-yr female with chest discomfort and nausea following Nissen fundoplication.**

- 3-yr history of severe “reflux” treated with Nissen fundoplication
- Immediate post-op nausea, substernal pressure sensation, dysphagia
- **Gurgling or low crackling sound when drinking or eating!**
- No improvement with esophageal dilation.
- Esophagram – Normal fundoplication
What happened?
AA is a 58 yo physician with an inability to swallow
   Extensive evaluation identified gastroesophageal reflux
   Nissen fundoplication
   Continued to have dysphagia and odynophagia
   localized to anterior neck within a second of swallowing.
   30 lb wt. loss
   No n/v, melena, heartburn
What happened?
10 yr history of solid and liquid dysphagia
Immediately coughs up swallowed food
Intermittant CP
5/8/11 Barium swallow
9/24/11 Video swallow study
Silent aspiration of thin barium, necture thick liquid and applesauce. Oropharyngeal and tongue weakness
10/20/11 Video swallow study
In and out penetration with liquid
Residue in valleculae and piriform sinuses
11/18/11 Water Swallows
1/18/11 Apple Sauce Swallows

1/19/12 GI Motility Consult
1-day history of SOB / Worsening dysphagia and CP
1/29/09 EGD with BoTox
Endoscopic improvement
Symptomatic improvement

1/5/13 GI Motility Consult
Dysphagia, regurgitation of food and saliva
1/15/10 and 2/1/10 EGD with BoTox

2/13/13 Admit
Vomiting of frothy liquid
O2 saturation 80%
2/13/13 Food Impaction

What happened?
60 yo woman with dysphagia and regurgitation
Scleroderma since 15 years old
GERD for 20 years controlled with PPI and lifestyle change
Morbid obesity (BMI = 48)
Pulmonary hypertension
6 months post operation
64 kg weight loss
Dysphagia, regurgitation, chest discomfort
Endoscopy – No esophageal or EGJ abnormality
Bx – 50 eos/hpf
Fluticasone and PPI no response
Esophageal manometry - Achalasia
Now solid food dysphagia and regurgitation
Heller Myotomy
Laparoscopic sleeve gastrectomy
Sleeve Gastrectomy

A. ESOPHAGUS, DISTAL, BIOPSY:
- Esophagitis with extensive parakeratosis, mild intraepithelial eosinophilia, edema and basal cell hyperplasia, consistent with reflux esophagitis
- No fungal forms identified
- No intestinal metaplasia

B. ESOPHAGUS, MID, BIOPSY:
- Acute Candida esophagitis
- Mild intraepithelial eosinophilia

C. ESOPHAGUS, PROXIMAL, BIOPSY:
- Acute Candida esophagitis
1. High-grade obstruction at the level of the junction of the gastric cardia and gastric sleeve with marked dilatation (7cm) of a patulous, largely aperistaltic esophagus.

2. Widely patent gastroesophageal junction.
What happened?
• 52 yo man with persistent and repetitive belching.

• No dysphagia, heartburn, cough or weight loss.

Endoscopy and barium swallow normal
Case 1

- 32 yo man with 1-year history of dysphagia described as sensation of food and water sticking in the substernal region.
- Substernal chest pain when eating. WU for cardiac disease negative.
- Night time regurgitation and cough
- 25 lb weight loss in 4 months

Endoscopy negative
Case 1

- Heller myotomy
- 3 months later continues to complain of dysphagia and regurgitation
- Why and what to do?

High-resolution Impedance Manometry – Failed Heller Myotomy

20 mm balloon dilation for resolution

Symptoms recur

10 sec
Case 2

- 42 yo woman with a history of BMI 41 and metabolic syndrome. Treated with sleeve gastrectomy.
- 35 pound weight loss and resolution of metabolic syndrome.
- Heartburn, postprandial and night time regurgitation.

Endoscopy – intact sleeve gastrectomy

High-resolution Impedance Manometry – Sleeve Gastrectomy

Conversion to gastric bypass—Resolution

UES

10 sec
Case 3

- 46 yo woman with a history of BMI 35 treated with laparoscopic band.
- 15 pound weight loss
- Solid food dysphagia, swallowed liquids produce a gurgle in the lower chest.

High-resolution Impedance Manometry - Lap Band

Deflation of band - Improved dysphagia
Gurgle resolved

10 sec
Case 4

- 23 yo college student with a history of post prandial regurgitation into the mouth.
- No dysphagia, heartburn, cough or weight loss.

Endoscopy normal

High-resolution Impedance Manometry - Rumination

Biofeedback therapy- Resolution

5 sec
Anorectal Manometry - Indications

- Fecal Incontinence
  - Functional anal sphincter weakness
  - Loss of volitional and reflex contraction
  - Anatomic defects (3D ARM)
  - Define abnormal rectal sensation

- Constipation
  - Pelvic Floor Dyssynergia
  - Define abnormal rectal sensation

- Pre/Post op
  - Pouch, Reanastomosis

- Hirschprung Disease

- Define abnormal rectal sensation

- Identify candidates for biofeedback

- Evaluate functional anorectal pain

Resting Sphincter

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Rectal Sensors 12 11

Rectum 10 8 6 4 2

Sphincter

External

10 sec
**Squeeze**

- Rectal Sensors

**Cough**

- Rectal Sensors

mmHg scale from 0 to 180.
Dyssynergic defecation

Rectal Sensors

Sensor Position

Simulated Defecation

mmHg

0

20

40

60

80

100

120

140

10 sec

Dyssynergic defecation

Rectal Sensors

Sensor Position

Simulated Defecation

mmHg

0

20

40

60

80

100

120

140

10 sec
Rectoanal inhibitory reflex

Hirschsprung Disease
MR is a 74 yo woman with scleroderma and fecal incontinence

- Total abdominal hysterectomy, bilateral salpingo-oophorectomy
- Bladder suspension
- Rectal prolapse and fecal incontinence
  - Repaired without resolution of her incontinence.

Defecography – spontaneous incontinence

Incontinence not responsive to dietary/medical therapy
Biofeedback therapy failed

What are the alternatives?

What happened?

Resting Anal Canal Pressures in 3D
Resting Anal Canal Pressures in 3D

Rectal Side

Right

Left

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