Laparoscopic Management of GERD

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Disclosures

- **None**

Objectives

- Discuss the current application of laparoscopic anti-reflux surgery
- Discuss the anatomy and technical aspects of hiatal hernia repair

GERD: Epidemiology and Cost

- In the U.S., more than 60 million adults experience GERD-like symptoms at least monthly
  - Most common outpatient diagnosis for patients with a GI complaint
- $12 billion spent on GERD treatment in 2004
  - 2/3 attributed to PPIs
  - % of patients prescribed a PPI during outpatient visit doubled between 2002 and 2009

Why do we treat GERD?

1. **Symptom control - patient QoL**

2. **Acid control - management or prevention of complications**
    - **Esophagitis**
    - **Stricture**
    - **Barrett's esophagus**

Medical Treatment

- **Proton Pump Inhibitors**
    - **Most commonly used medications for GERD**
    - **Powerful acid blockers**
    - **Control symptoms and heal esophageal lining in most patients with GERD**
        - **High failure rate in pts w/ severe esophagitis**
    - **Requires continuous therapy, and may become less effective over time**

Complications of PPI Therapy

- Increased risk of osteoporosis
  - Calcium non-absorption and bone fractures
- Increased enteric infections
  - C. difficile coilits
- Cost?
  - Name brand PPI → $$$
  - Six month cost can range from $204 to $4200
  - BID Nexium → $2,800 (235/mo)
- Drug-drug interaction issues
  - Plavix with PPI and increased risk of heart disease

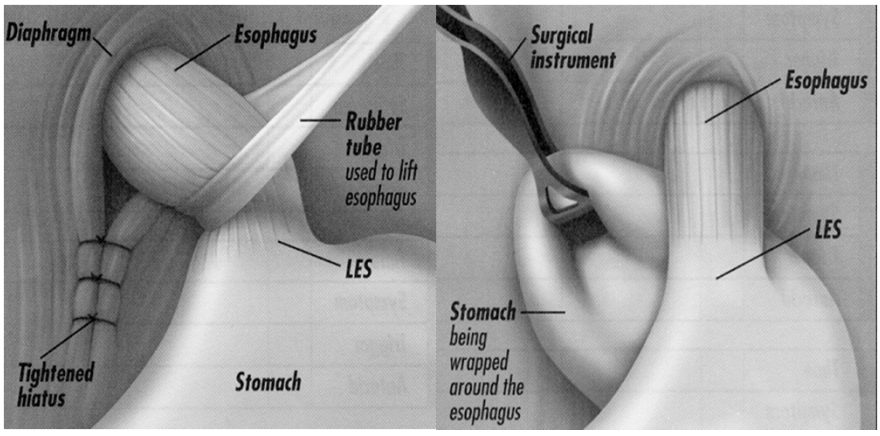
Indications for Procedural Treatment of GERD

- Complicated GERD (Stricture, Aspiration)
- GERD refractory to medical therapy
- GERD requiring daily PPI for control of symptoms

Predictors of Patient Satisfaction with Surgery

- Typical Symptoms of GERD
- Responsive to PPI's
- Abnormal 24 hour pH study
- Normal Esophageal Motility

Laparoscopic Nissen Fundoplication



Technique: The current surgical standard

- *for virtually all GERD except severe esophageal dysmotility*
- **Short (1-2cm), floppy, 360 degree laparoscopic fundoplication performed over a large bougie (>56 french)**
- **Short gastric vessels divided**
- **Closure of right and left crus**

Laparoscopic Nissen Fundoplication

- **Overnight stay required**
- **Modified diet for 4-6 weeks**
- **Excellent Long Term Results (11 yrs):**
  - **85% patients off PPI**
  - **Improved Quality of life**
  - **High rates of patient satisfaction**

Objective Follow-up: Normalization of esophageal pH

Author	# pts pH Negative	Follow-up (months)
Hinder	21/24 (87%)	3-12
Hunter	49/54 (91%)	12
Watson	42/48 (87%)	3
Peters	26/28 (93%)	21

Subjective Follow-up: Long-Term

Series	FU (yrs)	HB relief (%)	Revisions (%)	Off meds (%)
Morganthal (USA)	11.0	89	10.8	70
Dallemange (BEL)	10.3	96	1.4	92
Bammer (USA)	6.4	94	1.0	86
Lafullarde (AUS)	6.0	87	14.2	88
Anvari (CAN)	5.0	--	3.6	89
Booth (GBR)	4.0	90	6.3	86

Morganthal et al, J Gastrointest Surg 2007;11:693-700

Head to Head: Surgery versus PPI's

- **554 pts randomized to 2 arms(multi center)**
  - **288 standardized LNF**
  - **266 20mg esomeprazole (could be increased)**
- **No significant difference in remission rate between PPI (92%) and LNF (85%) at 5 years of follow-up**

Surgery versus PPI's

Symptom	LNF (180)	PPI (192)	P-value
Heartburn	8%	16%	0.140
Regurgitation	2%	13%	<0.001
Dysphagia	11%	5%	<0.001
Bloating	40%	28%	<0.001
Flatulence	57%	40%	<0.001

Conclusion: Laparoscopic Nissen Fundoplication

- **Excellent control of both symptoms and acid control**
- **Operator dependent**
- **Associated with side effects**
- **Fundoplication is best applied to the individual with severe symptomatic reflux disease, and/or mild to moderate esophageal damage.**

Update on GERD Treatment, Techniques, and Technology

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Objectives

- **Discuss the evolving trends in reflux management**
- **Review the currently available laparoscopic and endoscopic treatments and identify their niche in the management of GERD**

Why Do We Treat GERD?

1. **Symptom control - patient QoL**
2. **Acid control - management or prevention of complications**
    - **Esophagitis**
    - **Stricture**
    - **Barrett's esophagus**

Indications for Procedural Treatment of GERD

- Complicated GERD (Stricture, Aspiration)
- GERD refractory to medical therapy
- GERD requiring daily PPI for control of symptoms
  - Intolerance to PPIs
  - Concern about long-term effects

Why do we need new treatment approaches for GERD?

- Proton Pump Inhibitors
  - Most commonly used medications for GERD
  - High failure rate in pts w/ severe esophagitis
  - Requires continuous therapy, and may become less effective over time (30% have breakthrough sx)
  - Concern about cost and risk of osteoporosis and enteric infections

Why do we need new treatment approaches for GERD?

- **Laparoscopic Fundoplication**
  - **Highly efficacious – normalizes acid exposure**
  - **Invasive procedure with GI side effects**
    - **Dysphagia, flatulence and Bloating**

Typical GERD Patient in Surgery Clinic

- **2009:**
  - **Severe GERD with very poor symptom control**
  - **Large hiatal hernia**
- **2015**
  - **Patient with mild/moderate GERD symptoms +/- hiatal hernia with concerns about costs and side effects of long-term PPI use**

Endolumenal GERD Treatments

- **Radiofrequency energy application – Stretta**
- **Transoral Fundoplication – EsophyX**

Indications for Endoscopic GERD Therapy

- **Mild to moderate GERD symptoms**
- **Responsive to PPI therapy**
- **Objective evidence of GERD (pH study)**
- **Absent to minimal (<2cm) hiatal hernia**
- **<u>Forget it if</u>:**
  - **Complicated GERD**
  - **Long-segment Barrett's esophagus**
  - **Previous gastroesophageal surgery**

Stretta: Procedure

- EGD with identification of GE junction
- Placement of catheter above GEJ
  - Rf Application, 45 degree rotation
  - 8 applications, 2 below, 6 above GE jxn
- Total time about 30 minutes
  - Outpatient
  - Under sedation in the GI suite

Summary of Stretta Outcomes

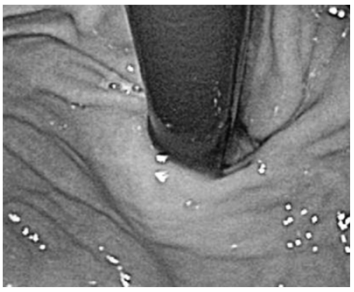
- Median drug requirement:
  PPI bid (baseline)⟶prn antacids (follow-up)
- Improvement in symptom scores and disease specific quality of life
- Acid exposure improved, but not normalized
- Low incidence of side effects
- Long-term data emerging with sustained efficacy in small cohort studies (8-10 years)

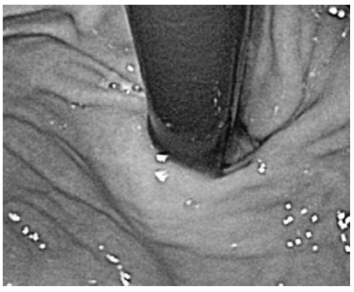
Stretta Conclusions

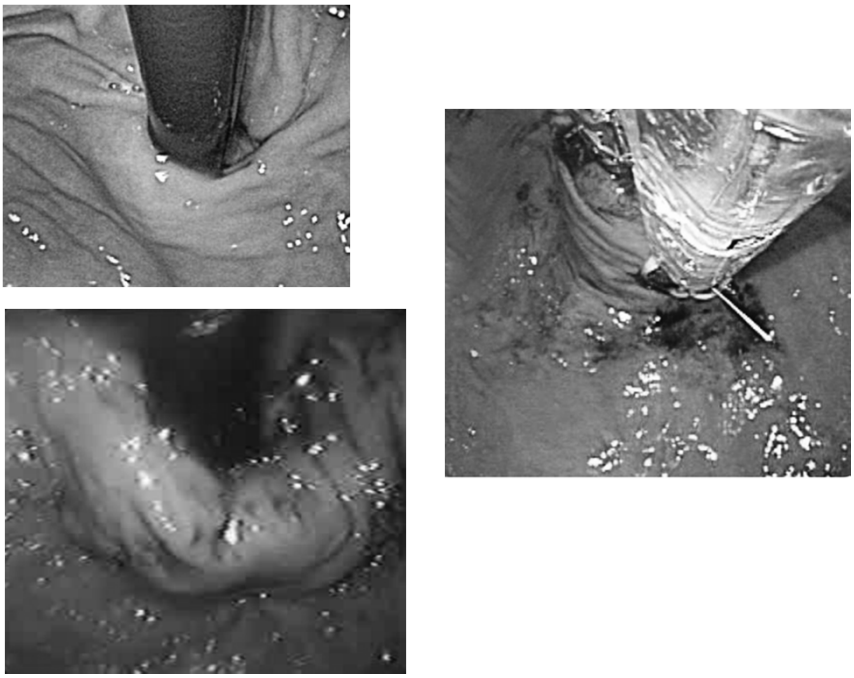
- Efficacy inferior to that achieved with fundoplication
- Relatively inexpensive outpatient procedure
- May represent a good option for patients with symptoms well controlled with medication but are:
  - Intolerant of PPIs
  - Concerned about long-term effects of PPI use
- Long-term data are needed to establish the cost-effectiveness of this approach

Transoral Fundoplication

- Over-the-scope device
- 45 - 60 minute procedure
- General anesthesia
- 14-20 transmural fasteners
- Overnight stay
- Post-op discomfort minimal
- Rapid recovery







Summary of TF Outcomes

- 2 RCT, several cohort studies
- Improved GERD symptoms and disease specific QoL at 6 mo (up to 3 yrs in cohort studies)
- Improved control of regurgitation symptoms compared to PPI therapy in sham controlled RCT
- Reduction in PPI use
- Esophageal perforations and GI bleeding have been reported
- Low incidence of GI related side effects

TF Conclusions

- **Effectively reduces GERD symptoms in select patients**
- **Low incidence of side effects, but does not consistently normalize esophageal pH**
- **RCT data emerging to solidify efficacy of this procedure**
- **Expensive**

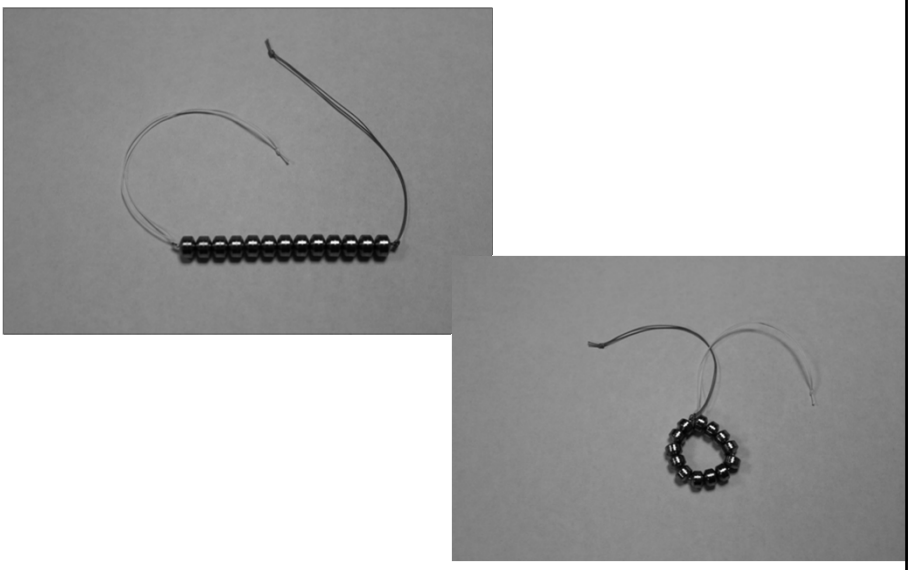
Endolumenal Therapy Conclusions

- **Generally less efficacious, but with more favorable side effect profile compared to LNF**
- **May find a role for management of patients with symptoms well controlled with daily PPI and minimal or no hiatal hernia**
- **Need to achieve adequate efficacy at a relatively low cost to gain wider acceptance**

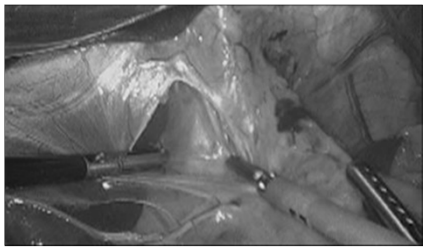
Linx: Technique

- **4 port laparoscopy – Similar to LNF**
- **Minimal dissection at the hiatus**
- **Device placed between the esophageal wall and posterior vagus nerve**

Linx: Device



Linx: Technique



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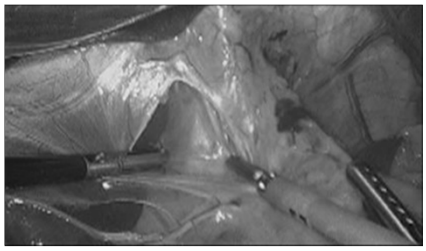

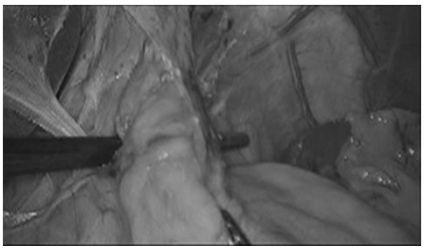

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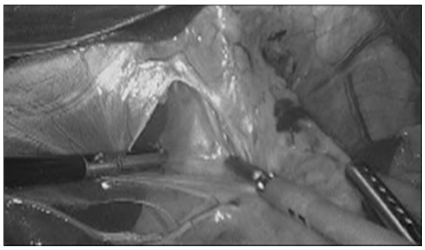

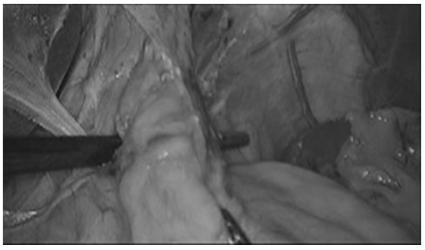

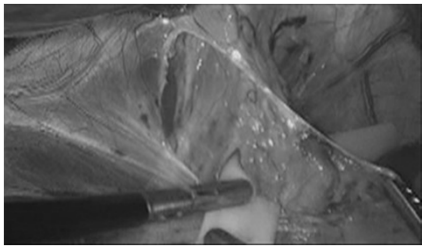

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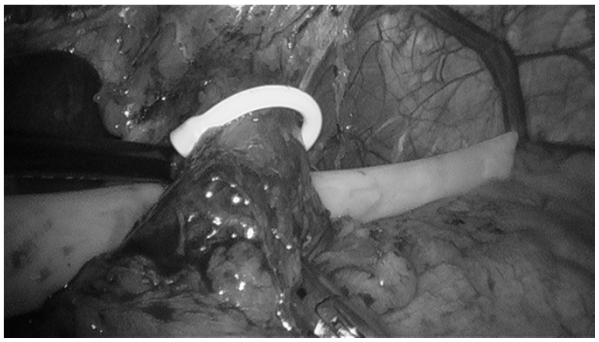

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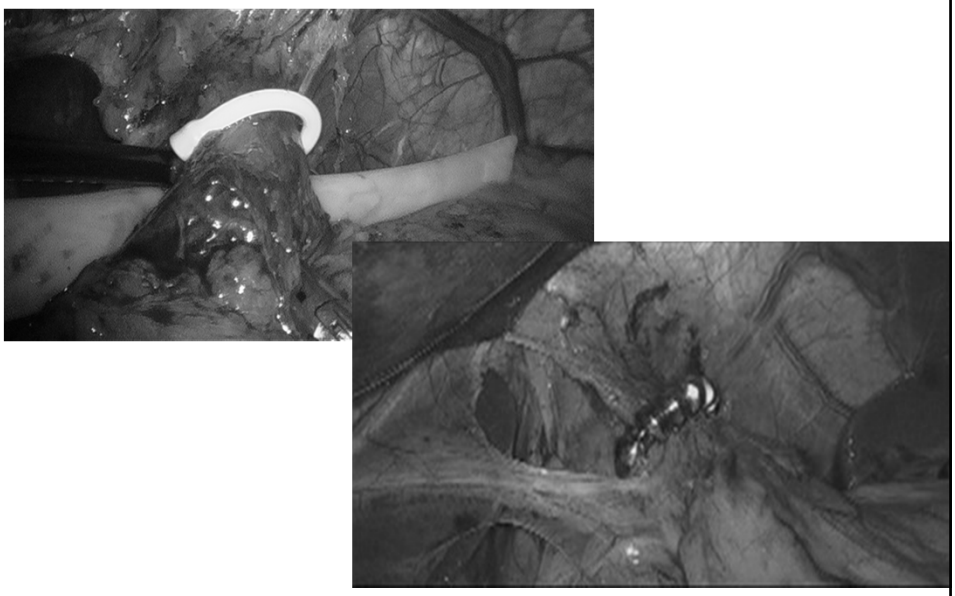
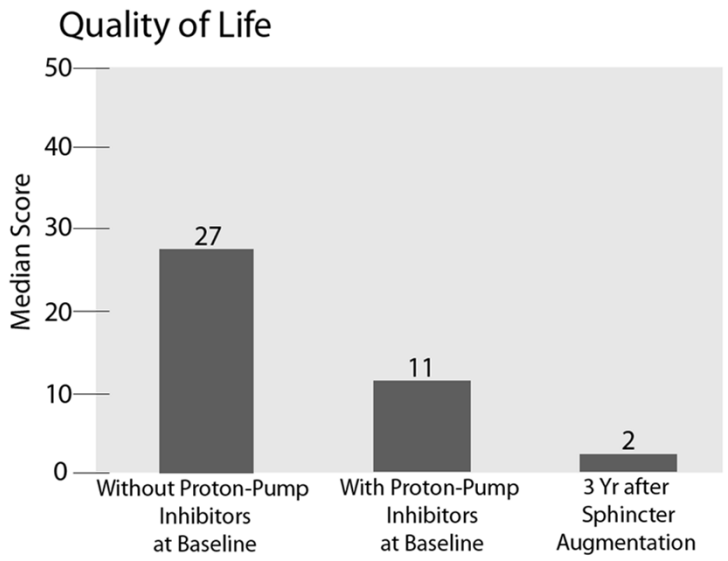


Linx: Results

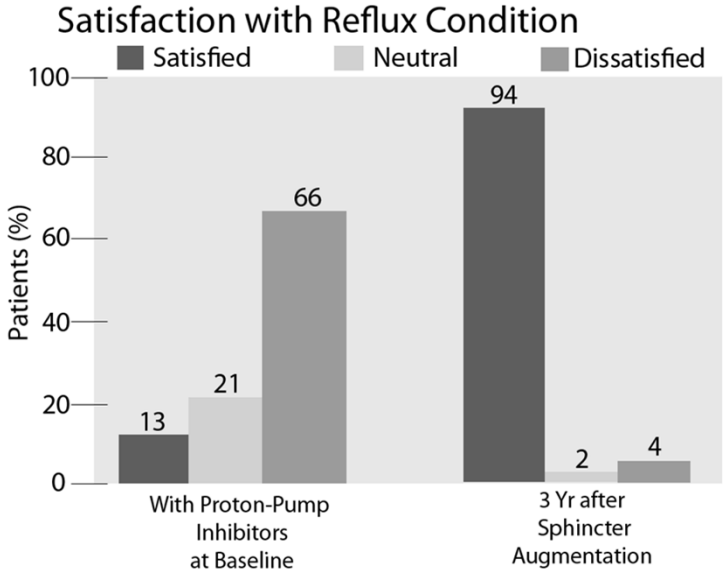
- 100 patients with 3 year follow up
- Primary endpoint - pH reduced by 50%
  - Achieved in 64%
  - pH normalized in 58%
- Secondary Endpoints
  - Symptom control
  - Quality of Life/Satisfaction
  - Complications

Linx: Results



Ganz et al. N Engl J Med 2013;368:719-727.

Linx: Results



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Linx: Complications/Side Effects

- Dysphagia in 68%
  - Moderate to severe in 21%
  - 3% required device removal
- Bloating – 14% (almost all mild)
- 6 devices removed
  - 3 for dysphagia
  - 1 each for pain, emesis, and persistent symptoms

Linx: Potential Advantages

- Easy to standardize procedure
- Potential for durable GERD relief

Linx: Questions

- Durability
  - Erosion?
- Cost-benefit analysis

GERD Treatment Strategy

- Symptoms well controlled with PPI
  - Medical acid suppression
  - May consider Stretta in select patients
- Breakthrough symptoms without HH
  - Consider stretta, TF, Linx, LNF
- Breakthrough symptoms with small HH
  - Consider Linx, LNF
- Large HH or Complicated GERD → LNF