“MOSCATI” Hospital, Avellino – ITALY

Abdominal & Thoracic Minimally Invasive Surgery Unit
Head: Francesco G. Biondo, MD

Gastro-Esophageal Reflux Disease
Surgical Treatment

web site: www.francescobiondo.it

Year 2012
GERD

It is defined as a chronic progressive and recurrent failure of the antireflux barrier allowing a long and frequent exposition of the esophageal mucosa to the gastric (40%) and/or duodenogastric secretions (60%)

(only alkaline reflux: 2% to 3%)
Evaluate carefully

- The economic costs of treatment
- The increasing surgical indication
- The results of medical and surgical treatment
- The opinion of patients

GERD has long been recognized as a significant public health concern.

1. for the rate of occurrence

- Western countries
  - 4% to 40% of adults

- GERD & esophageal cancer
  - strong association - low rate - still growing

2. for the quality of life

General health and Well-being Index

- Normal People
  - M: 103
  - F: 101

- Chronic cardiac failure: 93
- Cardiac pain: 92
- Duodenal ulcer: 85
- GERD: 84

$ 9.3 billions per year in the USA

- Medical management ~ $ 2.000 – 2.500 per year
- Laparoscopic surgery ~ $ 5.000 – 15.000 per year

CONCLUSION: Surgery seems to be more cost effective on average than medical management in many of the scenarios examined in this study. Surgery might not be cost effective if the treatment effect does not persist over the long term, if patients who return to medical management have poor health related quality of life, or if proton pump inhibitors were cheaper. Further follow-up of patients from the REFLUX trial may be valuable.
GERD
What’s new in the treatment

Medical treatment

Proton pump inhibitors

Surgical treatment

Laparoscopic floppy NISSEN

GABA-b
CCK-1
T LES Rs
GERD
Medical vs Surgical treatment (1)

88% SUCCESSFUL
71% RECURRENCE
6 months after end of therapy

No action on the failure of antireflux barrier (ARZ)

High doses & Long term PPIs therapy could allow:
dry mouth - nausea - vomiting - flatulence
atrophic gastritis - constipation - diarrhea
hepatitis - itchy rashes - polymyositis
rhabdomyolysis - arthritis - broken bones
gynaecomastia - visual defects
headache dizziness - sleep disorders, etc.

92% SUCCESSFUL
8% PROLONGED side effects


Mattioli S, 2003
Vakil NB, 2001
Caro JJ, 2001
Sontag SJ, 1997
Bardhan KD, 1995
**GERD**

Medical vs Surgical treatment (2)

*Surgical treatment is better than the antacids*

*Surgical treatment is better than the anti-H2*

*Surgical treatment is better than the PPI*
GERD
Medical vs Surgical treatment (3)

Clinical remission in 5 years of follow-up

- Surgery
- Omeprazol

% di remissione

months after therapy

Candidates for surgery

Assessment 1: clinical overlap of symptoms

GOAL

Relieving symptoms

Atypical

- dysphagia
- abdominal pain - chest pain - cardiac arrhythmias
- early satiety - postprandial fullness - gas bloat
- flatulence - diarrhea
- pharyngitis - sore throat
- hoarsness - laryngitis - cough - asthma

Typical

- Heartburn
- Regurgitation
- Belching

Complications

- Ulceration - Bleeding
- Stricture - Barrett’s
- Cancer - Pulmonary fibrosis

Very atypical

- lack of dentine - dental erosion
- odd taste in the mouth - bad breath
- mild tongue burns - ear-ache
- globus histicus
Response of atypical symptoms of GERD to laparoscopic antireflux surgery (before and 1 year after LARS)

Candidates for surgery

Assessment 2: endoscopic study

Three phenotypes

CRD: complicated reflux disease
ERD: erosive reflux disease
NERD: non erosive reflux disease

GERD

5 %
CRD

35 %
ERD

60 %
NERD

Functional heartburn (30% to 50%)
(physiological range of acid exposure)

EGD +

EGD -

GOAL

Improving p.o. quality of life of patients

Close attention to the preoperative psychological state of the patients

Influence of psychopathological changes on quality of life after laparoscopic fundoplication for the treatment of gastro-esophageal reflux

Does major depression in patients with gastro-esophageal reflux disease affect the outcome of laparoscopic antireflux surgery?

Conclusion

**Patients with pathological results in the preoperative GHQ-28 had poorer results in terms of postoperative quality of life despite having normal postoperative physiological studies.**

Conclusion

**Even if they are good surgical candidates from a physiologic point of view, GERD patients with concomitant major depression should be selected carefully. In these patients, LARS can normalize physiologic data, but some patients have demonstrated less symptomatic relief, suffered from postoperative dysphagia, and showed less quality-of-life improvement.**


Eseguire uno studio fisiopatologico completo

Studiare attentamente la personalità del paziente

Acquisire un consenso informato molto coinvolgente

Valutare obiettivamente le sequele dei due trattamenti

Candidates for surgery

Assessment 4: GERD not complicated

- pH impedenzometria delle 24 ore
- Manometria esofagea statica
- Test di vuotamento gastrico
- Rx del transito esofago-gastrico
- GERD HRQL - ReQuest

LARS 558 pts (1992 - 2009)

Patients in remission after LARS or on medical treatment

Lundell L et al.: Gut. 2008 Sep; 57(9): 1207-13
What are the indications for surgical antireflux treatment?

**C R D**: Barrett’s – Stricture – Grade 3 or 4 Esophagitis - Asthma *(30%)*

**E R D** with typical and extra-esophageal symptoms:

- Not compliant to medical therapy with drug side effects
- Failure of medical management *(dose (> 40mg) / time (> 1 year))*
- Frequent relapses after medical management
- Opt for surgery despite successful medical management *(due to life style considerations including age, time or expense of medications, etc.)*

**N E R D**: Abnormal acid exposure subgroup (50 – 70 %) *(Symptoms Index > 50%)*

- (persistent reflux-related symptoms despite medical therapy)
- with pulmonary & ORL complications (15%)

References:


Sages Guidelines: Revised in June 2001

Consensus conference of the European Association for Endoscopic Surgery: 1997
## GERD

Results of laparoscopic surgical treatment (1)

<table>
<thead>
<tr>
<th>Authors</th>
<th>N° patients</th>
<th>Follow-up months</th>
<th>Success Visick grade 1 e 2 (%)</th>
<th>Morbidity (%)</th>
<th>Mortality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zaninotto (2000)</td>
<td>319</td>
<td>6</td>
<td>91.5</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Dallemagne (1998)</td>
<td>127</td>
<td>16-44</td>
<td>92</td>
<td>2</td>
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<tr>
<td>Pessaux (2002)</td>
<td>1,470</td>
<td>36</td>
<td>94</td>
<td>3</td>
<td>0.07</td>
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<tr>
<td>Fernandez (2001)</td>
<td>265</td>
<td>4-92</td>
<td>93</td>
<td>7</td>
<td>0</td>
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<tr>
<td>Huttl (2002)</td>
<td>2,540</td>
<td>4-36</td>
<td>82</td>
<td>8</td>
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<tr>
<td>Granderath (2002)</td>
<td>169</td>
<td>60</td>
<td>98</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>DeMeester (1998)</td>
<td>100</td>
<td>21</td>
<td>96</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>
GERD
Results of laparoscopic surgical treatment (2)

### Complicanze peri-operatorie

19/544 pz (3.5%)

<table>
<thead>
<tr>
<th>Event</th>
<th>N° paz</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perforazione</td>
<td>3</td>
<td>0.56</td>
</tr>
<tr>
<td>Sanguinamento</td>
<td>2</td>
<td>0.37</td>
</tr>
<tr>
<td>Pneumotorace</td>
<td>3</td>
<td>0.56</td>
</tr>
<tr>
<td>Pneumopericardio</td>
<td>1</td>
<td>0.19</td>
</tr>
<tr>
<td>Polmonite</td>
<td>7</td>
<td>1.29</td>
</tr>
<tr>
<td>Fibrillazione atriale</td>
<td>1</td>
<td>0.19</td>
</tr>
<tr>
<td>Fibrillazione ventricolare</td>
<td>1</td>
<td>0.19</td>
</tr>
<tr>
<td>Arresto cardiaco</td>
<td>1</td>
<td>0.19</td>
</tr>
</tbody>
</table>

GERD
Results of laparoscopic surgical treatment (3)

<table>
<thead>
<tr>
<th>Author</th>
<th>N° of patients</th>
<th>Follow-up months</th>
</tr>
</thead>
</table>

**Complications / failure**

- Nissen - Toupet - Dor
- Recurrence: 7.5%
- Gas bloat: 5%
- Dysphagia: 4%
- Re-do: 7%
- Satisfaction Visick 1 and 2: 93%
- Dissatisfaction: 7%

GERD & Barrett
Results of laparoscopic surgical treatment (4)

54 pts with short Barrett’s
(< 3 cm)

Follow-up: 12 - 95 months post Lap Op

- Persistence of intestinal metaplasia 44%
- Regression of intestinal metaplasia
- Development of dysplasia 56%

147 pts with long Barrett’s
(> 3 cm)

Follow-up: 54 - 268 months post Lap Op

- Development of dysplasia 11%
- No progression or partial regression of metaplasia 85%
- Cancer development

Rebuild the antireflux barrier (ARZ) without altering the esophageal transit

GOAL

Surgical treatment

1. Esophago-gastric valve (EGV)
2. Lower esophageal “sphincter effect” (LESE)
### GERD

**Surgical treatment**

A look at the five most important principles of a quality surgical antireflux procedure:

<p>| | |</p>
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Spare the vagus nerve</strong> <em>(posterior, anterior and the hepatic branch)</em> <em>(it’s crucial)</em></td>
</tr>
<tr>
<td>2.</td>
<td><strong>Restore LES pressure</strong> <em>(LES must be exposed 1.5 - 2 cm to positive abdominal pressure - create a floppy esophagus &amp; a tension free fundoplication)</em></td>
</tr>
<tr>
<td>3.</td>
<td><strong>Mobilize the gastric fundus</strong> <em>(in order to enable neocardia relaxation)</em></td>
</tr>
<tr>
<td>4.</td>
<td><strong>Close the crural defect</strong> <em>(posterior hiatal closure without esophageal angulation)</em></td>
</tr>
</tbody>
</table>
| 5. | **Create a 360° floppy Nissen fundoplication** *(< 2 cm) that does not induce sphincter resistance superior to the esophagus peristaltic force*  
* (a 180/270° Toupet / Dor / Collis-Nissen / Belsey in same cases)  

✓
Sparing the vagus nerve
(posterior, anterior and the hepatic branch)

GERD
Surgical treatment (1)
Gas bloat syndrome (1% to 28%)

Mechanism:
- Often it pre-exist the treatment, sometimes it is a consequence of the vagus lesion

Tips & Tricks:
- Psychological evaluation – GERD HRQL - ReQuest*
- Barium esophago-gastrogram – 24-hour pH study
- Gastric emptying study
- Sparing the vagus nerve

ERD
- (N E M D - Parasympatic neuropathy -
- Neurovegetative distony -
- Psychological problems - Psychiatric problems
- “Upright” refluxers - Aerophagia -
- Delayed emptying gastric syndrome)

NERD
- (subgroup (S.I. > 50%)
- with pulmonary & ORL complications (15%))

Posterior / Anterior hemi-fundoplication (Toupet / Dor)

Better subjective outcome
- No gas bloat syndrome

Creating a floppy esophagus & a tension free fundoplication
Mechanism:

- Poor dissection of a shortened esophagus
- No fixation of the wrap to the stomach or esophagus (Rossetti’s stitch)

Failure: Partial shifting of the fundoplication toward the mediastinum

Mechanism:
✓ Poor dissection of a shortened esophagus
✓ Deficient crura approximation

Failure in relation to pathology:
- GERD not complicated: 97% (3% failure)
- Barrett's: 92% (8% failure)
- Esophagitis C L. A.: 90% (10% failure)
- Paraesophageal hernias: 80% (20% failure)

Reference:
Tips & Tricks:

- Create a floppy esophagus & a tension free fundoplication (endpoint)
- Leave the posterior vagus nerve outside the wrap
- Approximate crura without tension
- Rossetti’s stitches

Diaphragmatic hiatus

Failure: Total intrathoracic migration of the wrap (10%)

Mechanism:

- Deficient crura approximation
- Large peri-esophageal and mediastinal dissection
- Undiagnosed left pneumotorax

Short esophagus

**Tips & Tricks:**

- Barium esophago-gastrogram
- EGD  (GE junction)
- 24-hour pH study

  *in order to discover an unrecognized short esophagus*

  *(acquired short esophagus in 7% of cases)*

- Reestablish the GE junction without tension with a Collis-Nissen (Collis-Belsey) procedure

According to some Authors:

Gastric fundus mobilization and short gastric vessels division give no difference in postoperative outcome in terms of disphagia.

Some randomized trials have demonstrated that it is possible to achieve a tension free wrap without the division of the short gastric vessels.

Inadequate / Excessive gastric fundus mobilization

Inadequate gastric fundus mobilization can allow to a:

- **Misplaced or Disrupted wrap**
  (dysphagia – recurrent GERD)

  due to:

  ✓ excess of tension on the wrap
  ✓ excess of fat pad left on the GE junction

Excessive mobilization with fundal denervation (reduce belching and stimulus for transient LES relaxation)

can allow to a:

- Delayed emptying gastric syndrome
- Abdominal fullness
- Gas bloat syndrome
- Diarrhea

Inappropriately constructed wrap

Plication using the gastric body

Closing crura defect
(failures: > 10%)

GERD
Surgical treatment (4)

Only stitches

GERD  
Surgical treatment (4)

Closing crura defect  
(failures: 0 - 1%)

Prostheses

CruraSoft Patch

GERD
Surgical treatment (5)

Dysphagia after 3 months

Dysphagia after 12 months


Nissen 85%

Toupet

Nissen 34%
Toupet 16%

Nissen 6%
Toupet 7%
Persistent dysphagia > 3 months

Tips & Tricks:

- Tailored approach (i.o. pH study) ?
- 60-Fr Bougie ?

Mechanism:

- Fundoplication that is either too long or too tight
- Too tight closing of the crura defect

2 Failure: Persistent dysphagia ( > 3 mesi )

Mechanism:

- Pre achalasia / Unrecognized achalasia

Tips & Tricks:

- Pre operative esophageal manometry
- Barium swallow
**GERD Surgical treatment**

**Our experience 1999-2012**

*Follow-up 1 - 168 months*

<table>
<thead>
<tr>
<th>Morbidity</th>
<th>2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>0%</td>
</tr>
<tr>
<td>Shift to open</td>
<td>2%</td>
</tr>
<tr>
<td>Slippage / Twisted / Intrathoracic migration of the wrap</td>
<td>2%</td>
</tr>
<tr>
<td>Transient dysphagia (&lt; 3 months)</td>
<td>60%</td>
</tr>
<tr>
<td>Transient dysphagia (3 – 6 months)</td>
<td>10%</td>
</tr>
<tr>
<td>Persistent mild dysphagia (&gt; 6 months)</td>
<td>3%</td>
</tr>
<tr>
<td>Redo op / Dilatations for dysphagia</td>
<td>3%</td>
</tr>
<tr>
<td>Recurrence of reflux</td>
<td>2%</td>
</tr>
<tr>
<td>Re-do op for reflux</td>
<td>0%</td>
</tr>
<tr>
<td>Average post op days</td>
<td>3</td>
</tr>
</tbody>
</table>

**N° of patients**  150

| Male   | 65   |
| Female | 85   |
| M/F    | 0.76 |
| Average (years) | 48.3 (18-85) |

- **Satisfaction**  95%
- **Dissatisfaction**  5%

*Our experience 1999-2012*
1. Medical treatment is expensive and may be necessary throughout life span.

2. GERD is actually a composite disease and the indication for surgery must be individualized.

3. Complicated GERD is better treated by surgery.

4. In GERD patients with atypical symptoms and psychological 's flag must be very cautious.

5. In typical uncomplicated GERD, the patient must make his choice on the basis of a consensus very addictive.

6. Surgical therapy is effective and, if properly conducted, gets a hit in more than 90% of patients.

7. To date, the laparoscopic treatment is the gold standard.

8. The combination of laparoscopic and ablative endoscopic treatment is well promising for the treatment of patients with Barrett's esophagus with low grade dysplasia.
Thank you for your attention