If you are viewing this course as a recorded course after the live webinar, you can use the scroll bar at the bottom of the player window to pause and navigate the course.

This handout is for reference only. It may not include content identical to the powerpoint. Any links included in the handout are current at the time of the live webinar, but are subject to change and may not be current at a later date.

Reflux:

The Impact on our Patients and Evidence Based Treatments Part 2

Denise Dougherty, MA, CCC-SLP
doughertysppath@gmail.com

Learning Outcomes

After this course, participants will be able to:

- Identify the tests available to diagnose reflux
- Describe the impact of medications and diet for treating reflux.
- Identify the surgical and endoscopic treatments that have been found to have positive outcomes on reflux if pharmacology is not providing benefits for the patient.

8

Agenda

- Introduction
- Diagnosis, testing for reflux
- Medications and diet to manage reflux
- Surgical and endoscopic treatments for reflux and outcomes

9

Patient Interview

- Symptoms?
  - Frequency
  - Duration
- If pt. says he has asthma, particularly adult onset asthma, ask
  - more trouble getting air in or out?
- More trouble getting air in, no asthma –
  - symptoms likely reactive airway disease 2° to LPR
  - pH testing may identify NERD – abnormal acid exposure w/out visible lesions in distal esophagus (9)

- **Reflux Symptom Index (RSI)**
  - 9 item symptom severity scale completed by pt.
  - validated reflux outcomes instrument
  - 0=no problem/5=severe problem
- **Reflux Finding Score** – most reliable clinical dx
  - Grade laryngeal findings of LPR
  - mild, moderate, severe, obstructing – vocal fold edema, tiger stripe, postcricoid edema etc.
  - visual laryngoscopy

10

REFLUX

- Symptoms include:
  - Chest pain
  - **Hiccups**
  - Tongue pain
  - Halitosis
  - Odynophagia (painful swallow)
  - Hoarseness
  - Subglottic stenosis
  - Aspiration
  - Vocal fold granulomas
- Chronic cough/wheeze
- Absence of cough – ***airway numb to aspiration***
- Failure to thrive
- Sinusitis
- Apnea & cyanosis
- Colic irritability
- **Pneumonia – especially recurrent**

11

LPR Symptoms (9)

- Regurgitation
- Chest pain
- SOB
- Choking
- Hoarseness
- Vocal fatigue
- Chronic throat clearing
- Excessive throat mucus
- Postnasal drip
- Chronic cough
- Dysphagia
- Difficulty swallowing
- Difficulty breathing
- Lump in throat sensation
- Food sticking
- Airway obstruction
- Wheezing

12

Conditions w LPR (9)

- Dental erosions/cavities
- Esophageal spasms
- Esophageal stricture
- Esophageal cancer
- Reflux laryngitis
- Laryngeal cancer
- Endotracheal intubation injury
- Contact ulcers and granulomas
- Sudden infant death syndrome
- Sinusitis and allergic symptoms
- Sleep apnea
- Posterior glottis stenosis
- Arytenoid fixation
- Paroxysmal laryngospasm
- Globus pharyngeus
- Laryngomalacia
- Vocal cord dysfunction
- Paradoxical vocal fold movement
- Nodules and polyps
- Laryngospasm
- Asthma

13

LPR? (9)

- MOST accurate diagnostic reflux test
  - combination of pharyngeal/ues/esophageal manometry and ambulatory 24-hr dual pH probe (simultaneous pharyngeal and esophageal) monitoring.
- 2nd choice - Impedance monitoring
  - good supplement to pH testing
  - may identify injurious nonacid reflux

14

Why Test?

Is patient complaint ***REALLY*** due to reflux?

15

- Three main tests for Reflux
  - Esophageal pH monitoring
    - most definitive study for dx of GERD
    - measures acid reflux into lower esophagus.
  - Endoscopy
    - Aggressive/frequent use represents accepted status quo,
    - 80% w GERD will have normal EGD (1)
    - 20% of cases dx of GERD can be made on endoscopy.
  - Manometry

Diagnostic Tests

- Barium Swallow
  - **NOT a test for GERD**.
- Primus pH Probe
- Salivary Pepsin Test
- PPI Test
  - Prescribe PPI's based on pt. complaints
  - If complaints disappear, continue w PPI

16

Esophageal pH Monitoring

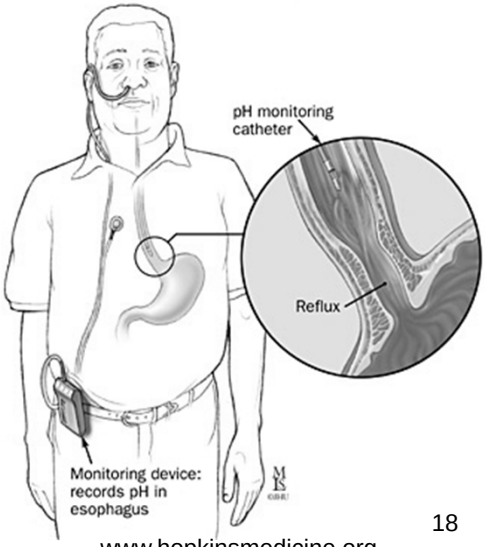
Three techniques:

- Single sensor pH monitoring w pH catheter
  - 24 hrs.
  - Measure distal esophageal pH, sensor placed 5 cm above upper border of LES
- Dual sensor pH monitoring w pH catheter
  - 24 hrs.
  - Measure proximal esophageal acid exposure, second sensor placed 1-5 below lower border of UES
- Wireless pH monitoring w Bravo pH capsule or OMOM pH monitoring capsule
  - 48 hours for Bravo capsule or more (96 hours) for OMOM capsule.
  - Attached to esophageal lining with clip.

17

Esophageal pH Monitoring

- Most pts never have this diagnostic test
  - even though they will likely take meds for life
- Long term PPIs have potential for significant side effects
- Research shows approx. **30%** taking PPIs **don't have GERD**, and are taking meds unnecessarily
- Test can definitively establish if GERD is/is not present (1)



18

www.hopkinsmedicine.org

Esophageal pH Monitoring

- Pt. must stop acid-suppressive medications prior to test.
- PPIs discontinued for 1 wk.
- Over the counter acid reducers (Zantac, Pepcid or Tagamet) or topical antacids (Tums or Mylanta) may be used

Disadvantage

- Nasal catheter often inhibits pts. usual diet and daily routine.
- If pt. has cardiac pacemaker, catheter method used (as opposed to telemetry capsule) (1)

19

Esophageal pH Monitoring

- Thin plastic catheter 1/16th inch diameter passed through nostril, into esophagus
- Sensor tip sensitive to acid
- Catheter protrudes from nose - connects to recorder (size of cell phone) to record each reflux event
- Probe plugged into monitor on belt or over shoulder
- 24 hrs. test
- Less data than capsule method
- Sensor placed in upper esophagus or pharynx to record LPR
- Touch button on monitor to record
  - Symptoms
  - Times you eat, lie down
- Data downloaded for analysis

20

Bravo and OMOM pH capsule

- Placed either transnasally, or following endoscopy
- Transnasal placement
  - 5 cm above upper border of LES
- Endoscopic placement
  - 6 cm above gastroesophageal junction.
- Pt. sedated for EGD
- Can be placed without sedation
  - Allows immediate return to work
- Capsule contains acid sensing probe, battery, and transmitter.
- Probe monitors acid in esophagus and transmits info to recorder worn by pt. on belt.
- Transmits for two or three days, then battery dies.
- Five - seven days later, capsule falls off esophageal lining and passed in stool.

21

Bravo and OMOM pH capsule

Advantages

- Absence of catheter connecting probe to recorder.
- Greater comfort without catheter in back of throat,
- More likely to go to work and do normal activities without feeling self-conscious

Disadvantages

- Cannot be used in pharynx or stomach

www.slgdocs.com

22

Esophageal pH Monitoring

- Determines why PPI tx not working.
  - Medication not adequate?
  - Symptoms not due to reflux
- If done while pt. on reflux meds and shows abnormal amts. of reflux
  - Treatment inadequate and needs to be changed.
- Reflux within normal range
  - Symptoms not caused by reflux
  - Consider other problems
- Record primary symptoms
  - Press buttons on monitor to record
  - Record times you are eating, drinking anything except water, or lying down

23

24 hr. pH Monitoring Study Results

(8)

- Pulmonary aspiration occurred w all patterns of reflux
  - Upright
  - Supine
  - Combined
- Dysphagia occurred w all patterns of reflux

24

24 hr. pH Monitoring Study Results

(8)

- Supine and combined refluxers
  - Supine episodes of long duration
  - Inability to clear acid from distal esophagus during sleep when little swallowing occurs
  - Prolonged clearance time
  - Lower esophageal mucous membrane –
    - Prolonged contact w hydrochloric acid and activated pepsin
- Upright and combined refluxers
  - Episodes of long duration
  - Inability to clear acid from esophagus after upright reflux episode
  - Occurred during activities which caused changes in intra-abdominal pressure
  - Esophagus more rapidly cleared by swallowing than supine reflux episodes

25

24 hr. pH Monitoring Study Results

(8)

- Supine refluxers
  - Inability to clear esophagus of acid
  - Predisposed to esophagitis
  - More esophagitis than upright refluxers
  - More episodes per hr. during day in upright position but cleared rapidly
- Both upright and supine refluxers
  - Severe esophagitis
  - Risk of developing strictures.

26

24 hr. pH Monitoring Study Results

(8)

- Combined refluxers
  - More esophagitis than supine refluxers
  - Meat impaction 2° an esophageal stricture (only in combined refluxers)
  - 31% w some esophageal motor abnormality
- Upright refluxers
  - Grade I esophagitis only seen w upright
  - During activities that change intra-abdominal pressure
  - Cleared more rapidly w swallowing
  - Excessive aerophagia
  - Occur in 2 hr. period after meals
  - Difficulty emptying stomach after meals
  - Emptying plateaus within 1st 40 min. after meal for another 40 min. then rapidly empties

27

24 hr. pH Monitoring Study Results

(8)

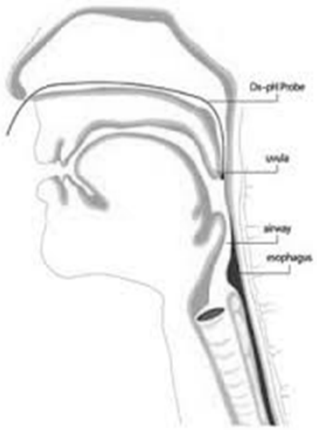
Anti-reflux procedures

- Stop reflux by correcting specific DES abnormalities associated w incompetency.
- Should occur earlier in treatment
- Skip prolonged medical management.

28

- LPR takes gaseous form
  - difficult to measure
- Micro sensor at end of catheter.
- Probe placed posterior to uvula in oropharynx.
- Swallowing/speaking not impeded.
- Minimally invasive placement allow pts to carry on everyday activities
- Measurements sent to recorder
- 24 hr. study

Primus pH Probe (18)

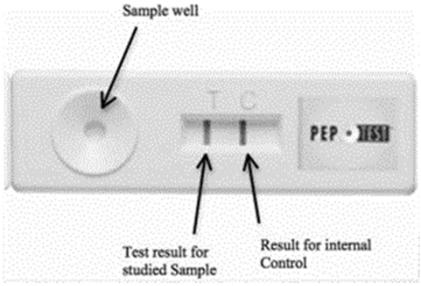


Cfpulmonary.com

29

Salivary Pepsin Test (18)

- Noninvasive rapid pepsin lateral flow device (LFD) detects presence of pepsin in saliva
- Primary premise - salivary pepsin only present if pt. has reflux
- May confirm LPR



www.researchgate.net

30

Endoscopy

- Flexible tube w light/video camera
- Tube passed through throat into esophagus
- Examine for esophagitis, strictures, Barrett's esophagus
- NOT usually done w mild symptoms
- Done if
  - Symptoms severe
  - Prolonged
  - Unresponsive to treatments, lifestyle changes, meds

www.parkside-hospital.co.uk

- Perform pH study at same time w little risk
  - rarely utilized (2)

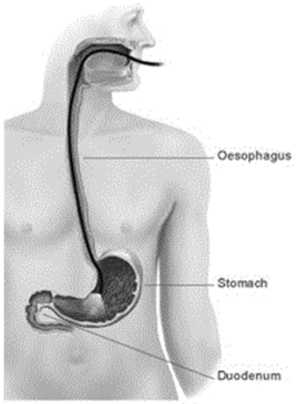


Figure 1
Upper GI endoscopy

31

Esophageal Manometry(3)

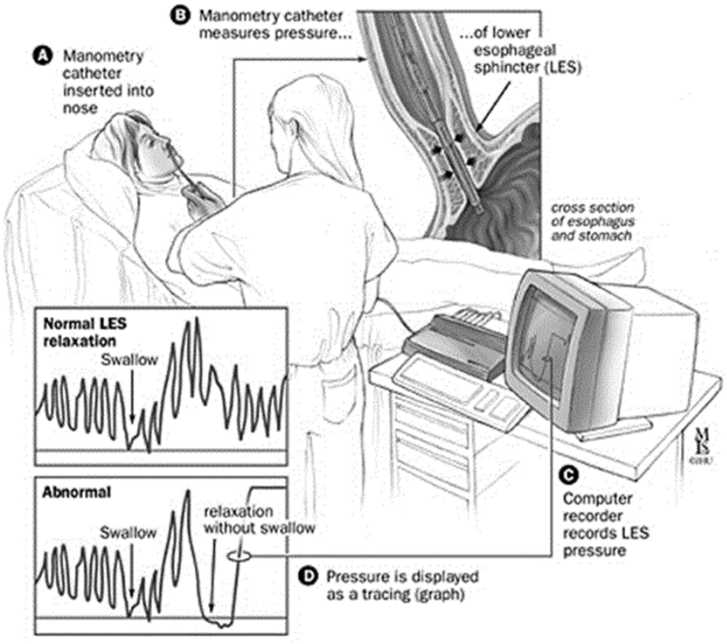
- Evaluate esophagus and LES function
- Not specific test for GERD
- May see changes consistent w GERD
- Discover specific esophageal contraction disorders that mimic GERD.
- Approx. 5% thought to have GERD have esophageal disorder uncovered w manometry.
- Many dx w GERD by previous pH testing have normal or close to normal manometry studies

32

Esophageal Manometry(3)

- Esophagus must contract in sequential manner
- Top end contracts first, then middle, then bottom
- LES relaxes to allow food into stomach
- Peristalsis measured during manometry in terms of pressure
- Esophagus squeezes
  - generates pressure
- LES opens
  - pressure lowers from its resting state
- Pressure measurements also measure length of LES
  - can detect hiatus hernia

33



www.hopkinsmedicine.org

34

Esophageal Manometry(3)

- 20 minutes test
- Tube w 36 separate pressure sensors passed through nose into stomach.
- 10 Wet Swallows W 20-30 Sec Interval Between (6)
- Pressure measurements processed and displayed

Profile LES

- Slow Withdrawal Of Catheter Through LES w .5 cm Increments
- Remain In Position For 3-5 Respiratory Cycles

Study Of Esophagus

- Response To Water Swallow
- Measures Esophageal Contractions
  - Amplitude
  - Duration
  - Velocity
  - Smooth And Striated Muscles
- Critical Measurements At 3 And 8 cm Above LES
- Most Motility Abnormalities Occur In Distal Esophagus And Smooth Muscles

35

Barium Swallow (4)

- Upper GI series, or UGI
- Should use w endoscopy to define anatomy of stomach and esophagus.
- Eval large hiatus hernias, strictures, or esophageal narrowing
- Provides info on peristalsis and timely stomach emptying
- May suggest GERD, but should not be used to diagnose
- 20 minutes to complete

www.kaahe.org

36

Barium Swallow
double contrast followed by low density

Double Contrast

Upright Portion Of BS

Swallow Effervescent Crystals & Rapidly Gulp High Density Barium

- Upright Left Posterior Oblique Position
- Esophagus Normally Smooth In Appearance

Recumbent Right Side Down For View Gastric Cardia And Fundus

Low Density

Prone Right Anterior Oblique

- Swallow low density barium
- Assess esophageal motility
- Dysmotility if abnormal peristalsis detected on 2+ of 5 Swallows
- Rapidly gulp optimally distends esophagus to rule out rings/strictures
- Right lateral position - Assess For Spontaneous GER (5)

37

Barium Swallow

Do BS If Pt. C/O Solids Sticking?

- Liquids – **Not** Solids – Tested
- Study May Look Normal!

Some doctors recommend barium swallow w solid bolus
follow bolus through esophagus

Barium swallows should be reserved for pts suspected of structural esophageal abnormalities

38

PPI Test (7)

- PPI test to dx GERD
- Potentially dangerous
- Safe and simple diagnostic tests available!
- Multiple studies W pH testing to validate GERD found 30% of PPI users are not refluxing
- Meds unnecessary

39

Lifestyle/dietary Treatment (9)

- Lifestyle/dietary treatment more important than anti-reflux meds
- Must use acid suppressive meds as well as diet, lifestyle modifications in combination if pt. presents w severe reflux
  - particularly those w reactive airways diseases - chronic cough, laryngospasm and asthma
- Obesity and reflux go together
  - pt. overeats, consumes a lot of fried and fatty foods, chocolate and carbonated beverages and eats late at night
  - high risk behaviors for reflux disease

40

(3)

- Healthy foods (bananas, pears, oatmeal) can trigger reflux in some people
- Pts w severe LPR
  - 2 wk. induction (detox) reflux diet
  - nothing consumed is pH less than 5
- No eating permitted within 4 hrs. of bed
- Consumption of alkaline pH less than 8 – water is encouraged
- Gets pts. better fast

General lifestyle recommendations

- Quit smoking
- Don't wear clothing too tight (trousers, corsets, bras, belts)
- Avoid exercising after eating – wt. lifting, jogging, yoga
- Don't lie down right after eating
- Don't eat anything within 3 hrs. of bedtime
- Elevate head of bed if nighttime refluxer
  - hoarseness, sore throat, cough in morning

41

Best for reflux food/beverage (3)

- Bananas
- Melons – best fruit for refluxers
- Aloe vera – great thickener and good for digestion
- Salad and vegetables (exclude onions, tomatoes, garlic, peppers)
- Rice/whole grains – brown rice, bulgur wheat, healthy bread
- Oatmeal – one of best breakfast foods
- Ginger – good for reflux
- Poultry – baked or grilled, skinless preferred
- Tofu
- Fish – all seafood is good for reflux

42

Pharmacological Treatment

43

Therapeutic trial w antireflux meds

(9)

- Medical treatment failure rates w PPI's are increasing
- Effective reflux management depends on dietary **and** lifestyle variables
- Acid suppressive meds alone no longer constitute appropriate therapeutic trial
  - Not reliable or cost effective

44

Over the Counter Meds (10)

Acid buffers – neutralize stomach acid, relieves heartburn

- Don't heal inflammation
- Liquid forms work faster
  - Maalox, Tums, Rolaids, Gaviscon, etc.
- Antacids w magnesium cause diarrhea
  - Milk of magnesia, Maalox liquid, Equate, Rolaids, Mylanta, Droxygel, Gelusil, Quick-Eze
- Antacids w aluminum cause constipation
  - Maalox, Mylanta, Equate, Droxygel, Maalox (liquid and tablet)

45

Over the Counter Meds (11)

H2 blockers

- Cause stomach to make less acid
  - Pepcid AC
  - Tagamet
  - Zantac
  - Axid
- Pts. w nocturnal reflux given PPI and H2 antagonist at bedtime
  - works better during sleep than PPI

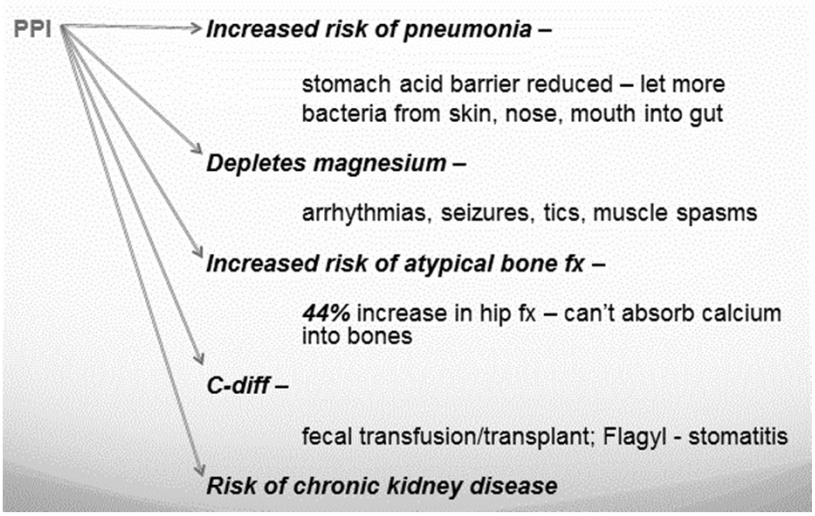
Proton Pump Inhibitor

- Block production of acid
  - Prevacid - omeprazole
  - Prilosec - esomeprazole
  - Nexium – esomeprazole

Ineffective in controlling regurgitation

46

Pharmacology



47

PPI's (12)

- Among most widely prescribed and overprescribed meds
- Studies suggest 25% - 70% of scripts written for PPI's in U.S. don't have appropriate medical indications
- Most commonly used anti-reflux drugs followed by H2 antagonists
  - $15 billion in annual sales in US alone
  - best acid suppression of any anti-reflux medication (9)

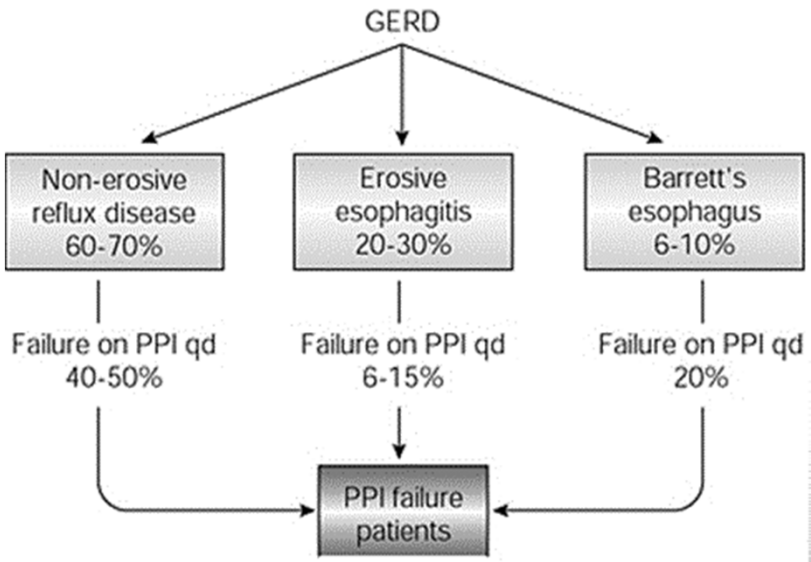
48

PPI's

- Controversial in recent years –
  - concerns about rebound hyperacidity following drug cessation – hypersecretion of acid (9)
- Pts w mild GERD symptoms using PPIs 60% more likely to develop Barrett's Esophagus, than those w more severe GERD symptoms
- Another study concluded PPI usage may reduce or eliminate symptoms
  - does not stop disease progression (12)

49

(16)



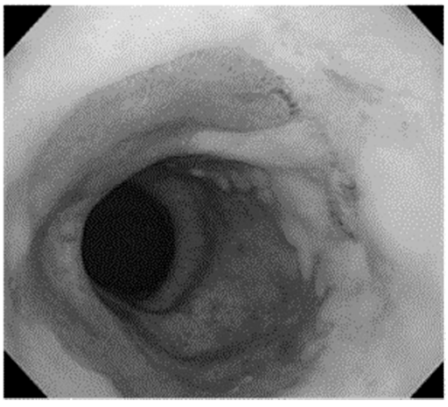
50

Common Disorders Associated With Reflux

51

Barrett's Esophagus (21)

- Premalignant Lesion For CA (Esophagus, Esophagogastric Junction)
- Chronic GER
- 96% w Hiatal Hernia 2cm Or Greater (13)
- Decreased LES Pressure
- Increased Frequency & Duration Of Acid Exposure, Hiatal Hernia.
- Ineffective Peristalsis = Poor Clearance Of Refluxed Gastric Contents (4)



52

Barrett's Esophagus (36)

Meds

- Proton Pump Inhibitors
- Aspirin and NSAIDS may protect against cancer
- Controls Heartburn But Regurgitation May Be Problem
- Escalate Dose To Control Symptoms
- **25%** Pts, BID **Did Not** Reduce Acid Exposure To Normal (4)

Surgical

- Esophagectomy:
  - High Grade Dysplasia And/Or Adenocarcinoma
  - Surgical Removal Of Esophagus (3)
  - Only tx that removes all damaged epithelium
  - Highest rates of short term mortality

53

Barrett's Esophagus Therapy - Endoscopic

Thermal Ablation

Remove thin layer of diseased tissue

- Multipolar Electrocoagulation – MPEC
- Argon Plasma Coagulation – APC
- Laser Ablation

Contraindicated:

- Prior radiation tx to esophagus
- Esophageal varicies
- Heller myotomy

Complications

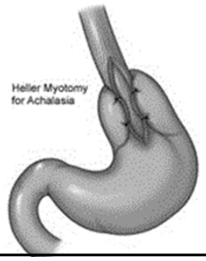
Mucosal laceration

Perforation of esophagus requiring surgery

Bleeding

Infection

Stricture formation requiring dilation



54

Categorized by Dysplasia Abnormal Cell Growth (36)

Low Grade Dysplasia

- Some Atypical Changes
- Does Not Involve Most Of The Cells
- Growth Pattern Still Normal
- Appears to progress to high grade dysplasia which progresses to cancer
- PPI's reduce incidence of dysplasia

High Grade Dysplasia

- Esophagectomy only therapy that removes all affected epithelium
- Highest rates of short term mortality
- Average hospital stay approx. 2 wks.
- 30-50% develop at least one serious complication
- Frequently causes long term morbidities – dysphagia, wt. loss, reflux, dumping syndrome
- Severe Precancerous Tissue Changes
- Growth Pattern Very Irregular

55

Endoscopic mucosal resection

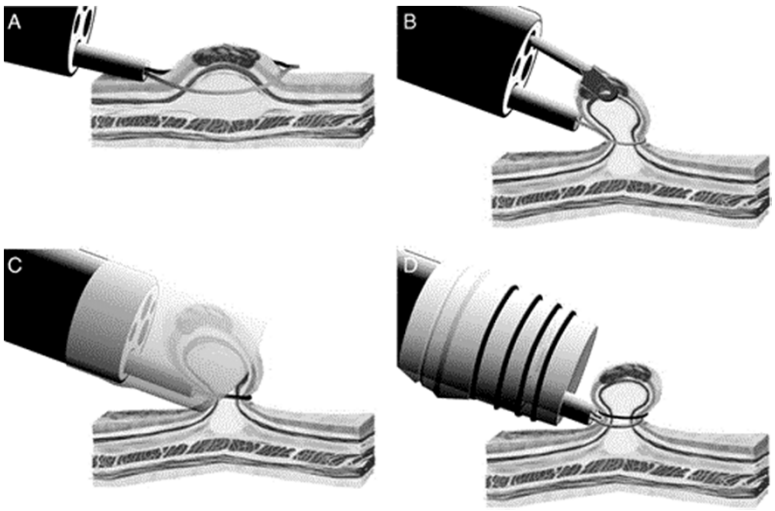
(22)

- endoscope to resect mucosal lesions.
- lesions lifted using saline solution or suction and excised w a cap and/or snare
- performed to accurately diagnose depth of lesion and as potential curative procedure for high-grade dysplasia

56

Endoscopic Mucosal Resection

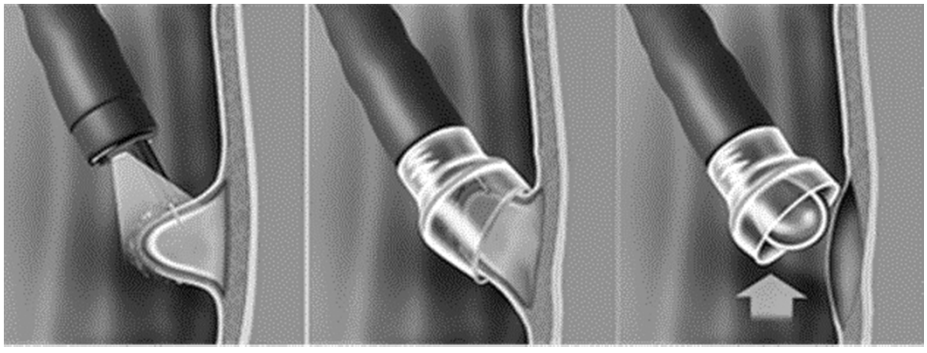
jco.ascopubs.org



57

Endoscopic Mucosal Resection

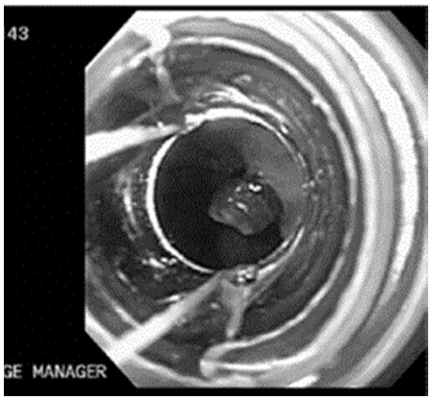
www.michaelbickford.com.au



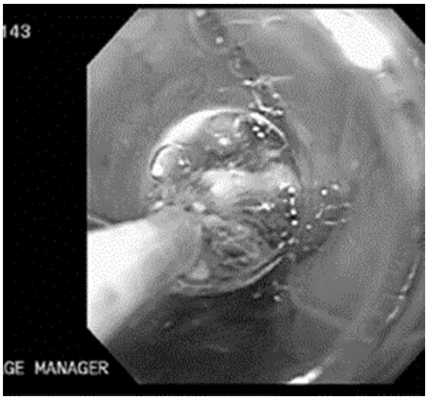
58

Removal of early adenocarcinoma

(27) Banding/snare technique



Specimen retrieval w/net basket

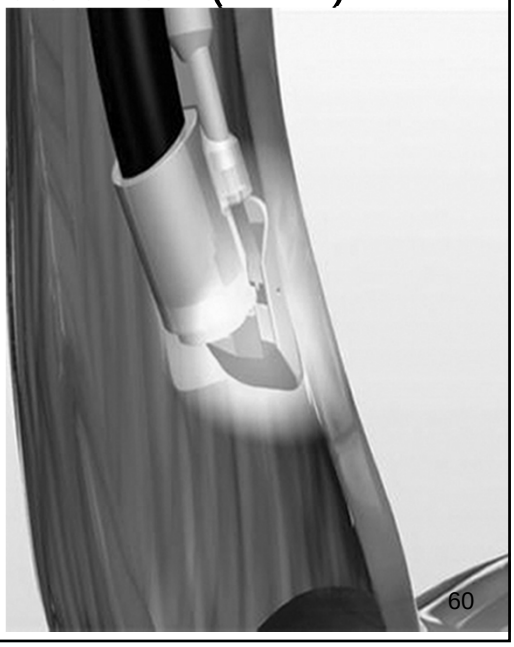


59

Radiofrequency ablation (RFA)

(22)

- direct thermal energy applied to esophageal lining
- probes fixed to endoscope tip for radiofrequency ablation.
- strong evidence supports RFA for eradication of flat, residual Barrett's esophagus (following EMR) in pts w high-grade dysplasia and pts w no or low-grade dysplasia w additional risk factors.



www.wikirefua.org

60

Photodynamic therapy (PDT)

(22)

- Porfimer sodium accumulates in dysplastic tissue
  - Tissues light sensitive and destroyed when activated by endoscopic light source.
- Significantly more effective than PPI in eliminating high-grade dysplasia
- While PDT and argon plasma coagulation (APC) therapies were equally effective in eradicating Barrett's mucosa, PDT more effective in eradicating dysplasia .
- used w pts w esophageal cancer and local failure after chemo/radiotherapy, and pts w early stage esophageal tumors who refused/not candidates for esophagectomy.

61

Photodynamic therapy (PDT)

(22)

Pro

- Significantly more effective than PPI in eliminating high-grade dysplasia
- While PDT and argon plasma coagulation (APC) therapies were equally effective in eradicating Barrett's mucosa, PDT more effective in eradicating dysplasia

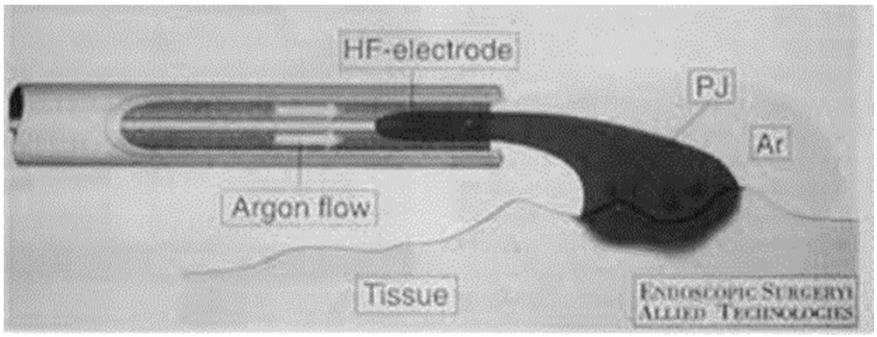
Con

- Porfimer sodium accumulates in tissue
  - remains in body up to 2 months
  - extremely photosensitive, and must avoid any exposure to sunlight.
- Main adverse effect is formation of strictures
  - high as 30%

62

Argon plasma coagulation (APC) high-frequency current conducted to tissue by ionized argon gas (22)

www.lireriauniverso.it



63

Argon plasma coagulation (APC)(22)

Pro

- In 70% of pts.
  - 95% Barrett's tissue replaced w healthy mucosa
  - 40% complete regression of Barrett's tissue
- 25% surveillance pts
  - 95%+ regression of Barrett's tissue.
- easy to use for small lesions (<4 cm), and
- reasonable safety profile

Con

- Strictures in 5% to 10% pts.
- Heightened risk of buried glands
  - More common w APC vs. other ablative techniques
- Major complications
  - Pain
  - Dysphagia

64

Multipolar electrocoagulation (MPEC)

(22)

- Thermal energy through probe via endoscope to deliver current between two or more electrodes.
- 139 pts w Barrett's/no dysplasia followed over 10 yrs.
  - Recurrence in less than 5%
  - No adenocarcinoma or high-grade dysplasia in pt.
- MPEC and APC reported equal efficacy to completely eradicate Barrett's esophagus.

Major complications

- Painful swallowing
- Chest pain
- Fever
- Gastrointestinal bleeding
- Stricture

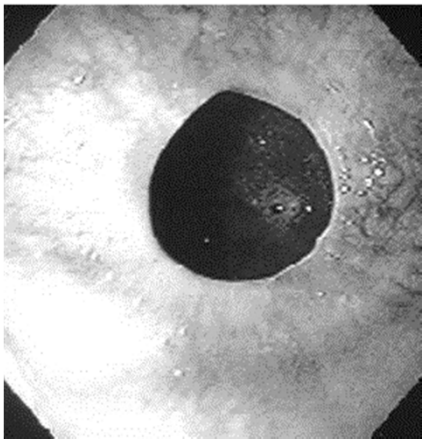
Disadvantages

- Multiple procedures required
- Only small area treated at one time (<4 cm).

65

- Seen w Chronic Inflammation and Fibrosis, strictures
- Diameter less than 13mm creates symptoms of dysphagia
- May Have Reflux, **Hiatal Hernia**, Reflux Esophagitis
- Recurrence Common
- **65% Have Abnormal Esophageal Acid Exposure**
- **Studies suggest acid suppression may prevent recurrence of rings after dilation** (42)

Schatzki's Ring (24)



66

Eosinophilic Esophagitis

- Diagnose by biopsy
  - 6 to 9 biopsies
- GERD + dietary or airborne allergens = EE
- Chronic inflammation, fibrosis, then rings & scarring
- PPI 2x/day normalizes eosinophil levels
- Heal esophagitis before EE resolves
  - esophagitis allows eosinophil buildup

Guidelines:

- PPI
- Steroids
- Dilatations
- Food removal

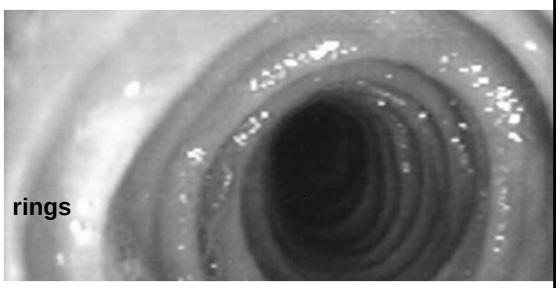
- Deep mucosa tears occur frequently
- Guide wire dilation under fluoroscopy
- Oral corticosteroids
- Removal of foods (17)

67

American Partnership for Eosinophilic Disorders

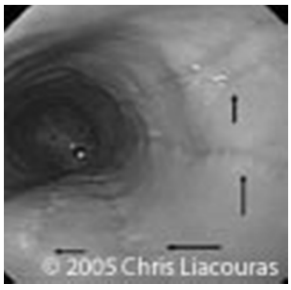
www.apfed.org

white plaques

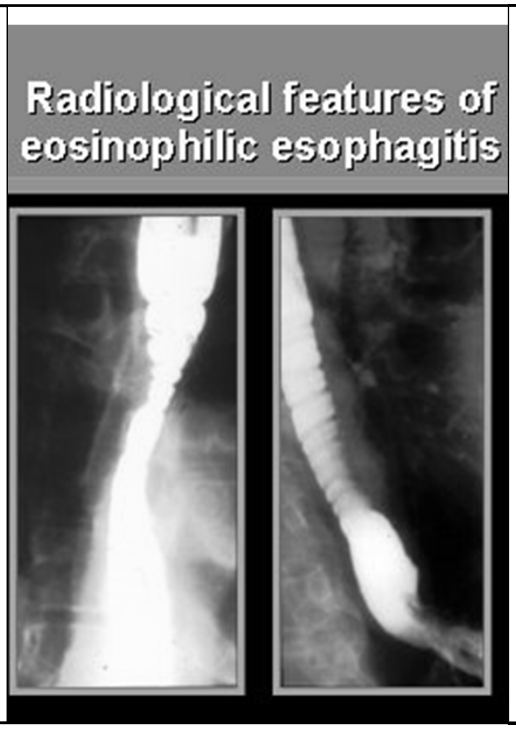


rings

furrows

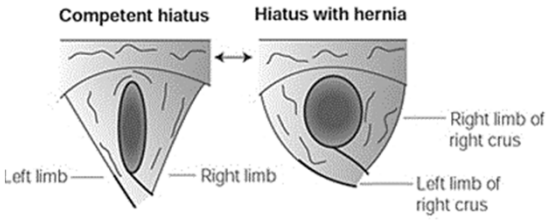


68



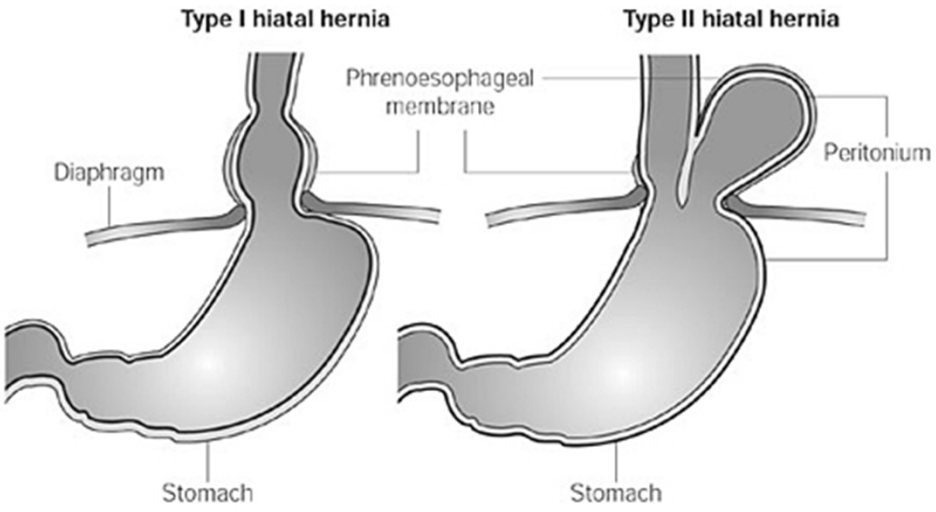
- Elliptically Shaped Slit Through Diaphragm
- **Type 1 "Sliding"** –Slit Turns Into Rounded Opening
  - Most Frequent Hernia – 50-94% Have GERD
  - Acquired Condition In 5th Decade Of Life
  - Possible Cause – Pregnancy, Obesity, Reflux – impaired acid clearance
- Re-reflux From Hernia w swallow
  - Occurs During Inspiration From Loss Of Normal One Way Valve Function
  - Can't Prevent Backflow (13)

Hiatal Hernia (25)



70

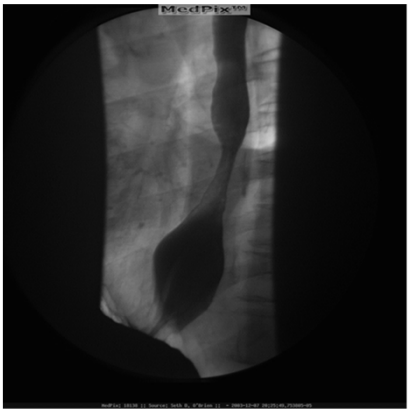
Type I vs. Type II (25)



71

Strictures/Reflux Stricture/Peptic Stricture

- 60-70% GERD Related
- Fibrotic Narrowing From acid
- 30-40% From Corrosive Injury, Radiation, Sclerotherapy Or Photodynamic Therapy
- Careful Hx Diagnoses 80% Of Cases
- Dysphagia W Solids
  - From Degree Of Esophagitis + Stricture Diameter (23)



72

Conditions associated with strictures (26)

- Barrett's esophagus
- Scleroderma
- Schatzki's rings
- Post achalasia treatment
- Prolonged nasogastric tube intubations
  - Impaired les function
  - Prolonged acid exposure
- Hiatal hernia – 85% w strictures
- Medications – aspirin and NSAIDS – 75% of pts consume these drugs
  - 50% w benign esophageal structures had taken NSAID within 12 months preceding dx
- GERD
- Esophageal cancer
- Radiation therapy
- Esophageal surgery
- Eosinophilic esophagitis
- Sclerotherapy
- Causting injury
- PDT - photodynamic therapy

73

Strictures

- **Dilation**
  - **Initial Dilator** Approximates Estimated Diameter Of Stricture
  - Two Additional Dilators Of Increasing Size
  - **Rule Of Three Is Standard**
  - Some Dilated Over More Than One Session
  - 95% Relief Of Dysphagia
  - Pts w peptic stricture should be treated w PPI
  - PPI decreases stricture recurrence and need for repeat
- **Fundoplication**
  - Effective For Dysphagia In GERD Pts W Peptic Stricture
  - Reduces Requirement For Repeat Dilation
- **Steroids**
  - Reduce Inflammation
  - Only Anecdotal Reports (19)

74

Gastroparesis

- Delayed Gastric Emptying
- Vagus Nerve damage
- Diagnosed By Endoscopy, Ultrasound, Barium Swallow
- Food Retention Creates
  - Bacterial Overgrowth
  - Solid Food Hardens/Blocks Passage Of Food
  - Difficulty Controlling Blood Glucose Levels (17)

Causes

- **GERD**
- Amyloidosis
- Scleroderma
- Parkinson's
- Hypothyroidism

Symptoms

- Heartburn
- GERD

75

Treatment - Gastroparesis

- **Gastric Electrical Stimulation**
  - Battery Operated Device Releases Electrical Pulses
  - **Botox**
  - Need Further Research
- **Medication**
  - Reglan********
  - Erythromycin
  - Domperidon – not FDA approved in US BUT may be obtained in certain circumstances
  - druginfo@fda.hhs.govcircumstances
- **Dietary Changes**
  - 6 Small Meals
  - Liquid/Puree Diet
  - Avoid High Fat (Slows Digestion) / High Fiber Foods (Hard To Digest)
  - Avoid Oranges/Broccoli – Contains Material That Can't Be Digested
- **Feeding Tube** – J Tube Bypasses Stomach
  - Last Resort
- **Parenteral Nutrition**
  - Nutrients Directly Into Blood Stream (13)

76

Presbyesophagus or Presbyphagia (24)

- Failure Of Peristalsis In **Older** Esophagus
- LES Changes Little
- Some Damage Reflux Based
- Pts With Ineffective Motility Often Have LES Hypotension
- No Treatment To Restore Muscle Contractility
- Little/No Dysphagia
- W dysphagia, Look For Complicating Disorder – Reflux Esophagitis Or Peptic Stricture (14)

77

Ineffective Esophageal Motility Disorders

Found With

- Mixed Connective Tissue Disease
- Rheumatoid Arthritis
- Lupus
- DM
- Amyloidosis
- Alcoholism
- Multiple Sclerosis (17)

78

Surgical and Endoscopic Approaches

79

Endoscopic Approaches for Reflux

(15)

Medications only control symptoms

does not address underlying cause of reflux – damaged LES

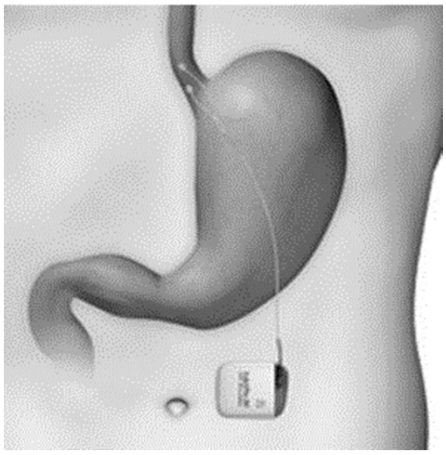
Procedures to repair LES:

- Nissen fundoplication
- Partial fundoplication
- Transoral Incisionless fundoplication
- Stretta
- LINX

80

- Temporary LES electrical stimulation increases pressure without interference w relaxation
- LES – EST safe and effective for GERD
- Significant and sustained improvement in symptoms, reduced acid exposure w elimination of daily PPI use, and no adverse effects
- Chronic stim of LES w improved GERD may be sustained after EST stopped
- Limited to investigational use in US

EndoStim (19)



www.medicalexpo.com

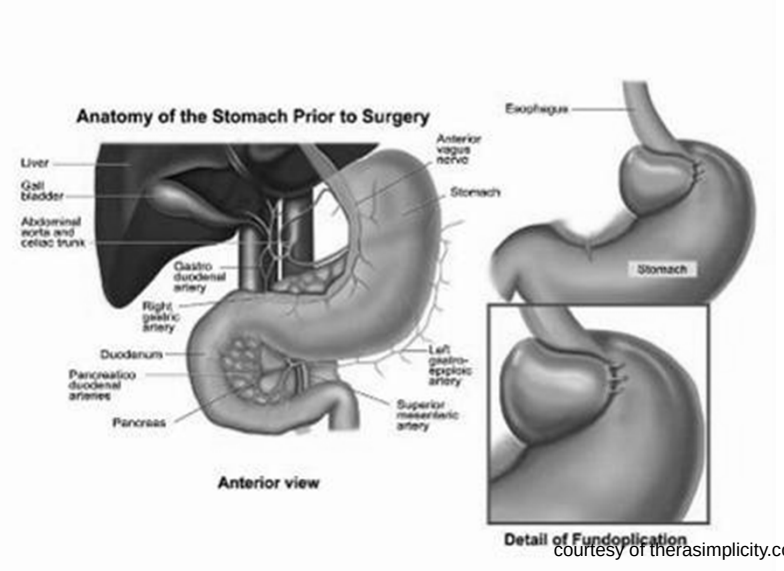
81

Nissen Fundoplication (9)

- Primary effective surgical option for treatment
- Wrap dome of stomach around esophagus
- Sew to produce tight angle where esophagus enters stomach
- Single most effective treatment for GER and LPR
- Recommended for pts. w lung disease related to reflux and pts. who can't tolerate/fail medical treatment

82

Nissen Fundoplication



courtesy of therasimplicity.com

83

Nissen Fundoplication (15)

Pros

- Safe and effective
- High success rate
- Proven long term success
- Eliminates or reduces need for meds

Cons

- Long term
  - Dysphagia
  - Diarrhea
  - Bloating
  - 1/3 unable to belch/vomit

Complications w surgery

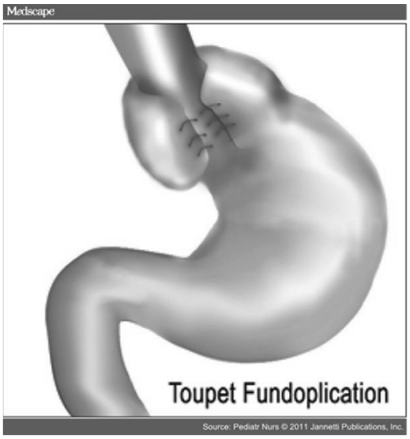
- Bleeding
- Injury to abdominal organs

84

Partial Fundoplication or Toupet

(15)

- Stomach wrapped only partway around lower esophagus
- Used when esophageal function damaged by long term reflux



www.medscape.com

85

Partial Fundoplication or Toupet

(15)

Pros

- Safe and effective
- High success rate
- Proven long term success
- Eliminates/reduces meds
- Fewer side effects than Nissen

Cons

- Possibly less durable than Nissen
- Effectiveness decreases over time

86

Stretta: www.reflux1.com For Video

Radiofrequency Energy To Gastroesophageal Junction

Catheter W 4 Electrodes Creates Rings In Esophagus

Tightens LES

- Reduced/Eliminated meds
- Improvement In Heartburn

87

Stretta (15)

Pros

- Treated sphincter becomes stronger
- Less invasive than laparoscopic surgery
- More than 5 yrs. of clinical studies show significant improvement in QOL

Cons

- May not totally eliminate meds

Side Affects (1st 1000 Cases)

- Aspiration
- Pleural Effusion
- Atrial Fibrillation
- Death

88

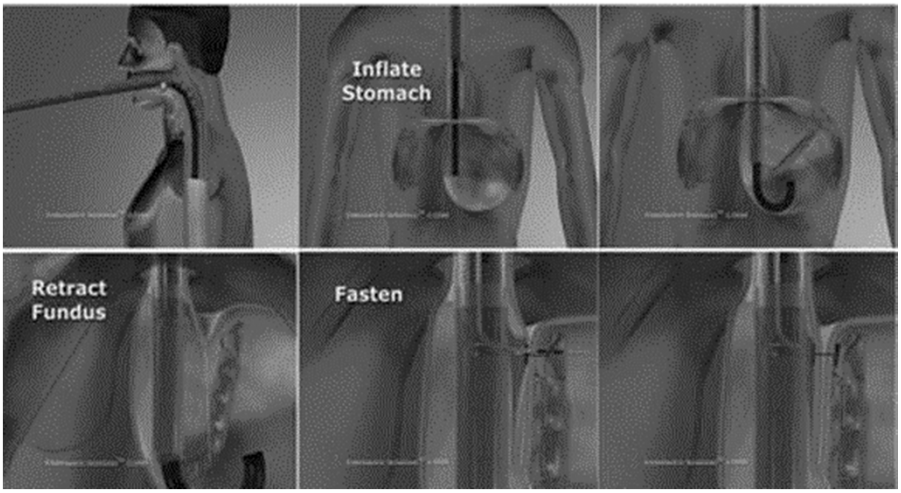
Transoral incisionless fundoplication

- 40% of PPI-dependent pts. have troublesome GERD symptoms, despite PPI tx
- Can be repeated and reversed
- TF was effective treatment for pts. w GERD symptoms, particularly those w persistent regurgitation despite PPI tx, based on evaluation 6 months after procedure (20)

89

Esophyx Transoral incisionless fundoplication

www.healthtap.com



90

Transoral incisionless fundoplication (15)

Pros

- Minimal pain
- No scars
- Fast recovery time
- Very few side effects
- Reduce/dc meds

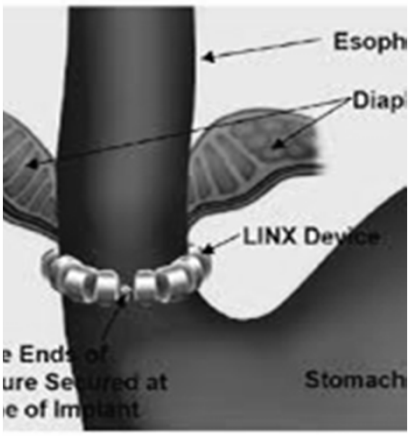
Cons

- Does not reliably stop reflux
- Hiatus hernia – if present – cannot be repaired
- Durability is unclear

91

LINX (15)

- Small flexible band of beads w magnets
- Placed around outside of esophagus
- Magnetic attraction between beads helps sphincter stay closed to prevent reflux
- Swallowing food allows beads to separate



92

LINX (15)

Pros

- High success rate in stopping reflux and eliminating PPI use
- Minimal side effects
- Safer than long term use of PPI's
- Reversible and can be replaced

Cons

- New procedure
- Long term results yet to be confirmed
- Not all GERD pts are candidates
- Side effect is difficulty swallowing – subsides over time

93

What to Remember?

Your Role!

Understand information you learn w diagnostic tests

Reflux and associated disorders

Available treatments

- lifestyle/diet changes
- pharmacological
- surgical
- endoscopic treatments

94

Bibliography

1) www.refluxmd.com/learn/resources/2012-09-19/369/what-expect-ambulatory-ph-testing#sthash.wKc7p5C2.dpuf

2) www.refluxmd.com/learnresources/2012-09-19/369/what-expect-endoscopy-testing#sthash.wKc7p5C2.dpuf

3) http://www.refluxmd.com/learn/resources/2012-09-17/349/what-esophageal-manometry#sthash.mb1DSj0i.dpuf

4) http://www.refluxmd.com/learn/resources/2012-09-14/314/what-expect-barium-swallow#sthash.BtfYcM0s.dpuf

5) Levine, M., Rubesin, S.(2004). Radiology Of The Pharynx And Esophagus. In J. E. Donald O Castell, *The Esophagus, 4th Edition* (Pp. 340-350). Philadelphia, PA: Lippincott, Williams & Wilkins

6) Freeman, J., Hila, A., Castell, D. (2004). Esophageal Manometry. In J. E. Donald O Castell, *The Esophagus, 4th Edition* (Pp. 340-350). Philadelphia, PA: Lippincott, Williams & Wilkins.

7) http://www.refluxmd.com/learn/resources/2013-08-20/4838/diagnosing-gerd-first-step-towards-treatment#sthash.MYZDNG5x.dpuf

8) DeMeester, T. R., Johnson, L. F., Joseph, G. J., Toscano, M. S., Hall, A. W., & Skinner, D. B. (1976). Patterns of gastroesophageal reflux in health and disease. *Annals of surgery*, *184*(4), 459.

95

9) Koufman, J. A., & Wright Jr, S. C. (2014). Laryngopharyngeal reflux and voice disorders. *Diagnosis and Treatment of Voice Disorders,*, 419-430.

10) Antacids – www.wikipedia

11) Heartburn OTC drugs; www.webmd, heartburn/GERD Health Center

12) Lazarus, B, et al "*Proton pump inhibitor use and the risk of chronic kidney disease*" JAMA Intern Med 2016; DOI: 10.1001.jamainternmed.2015.7193

13) Gastroparesis. (2007, July). Retrieved September 3, 2011, From National Digestive Diseases Information Clearinghouse (NDDIC): Http://Digestive.Niddk.Nih.Gov/Diseases/Pubs/Gastroparesis

14) Heading, R., Castell, Donald. (2004). Clinical Spectrum And Diagnosis Of Gastroesophageal Reflux Disease. *The Esophagus, 4th Edition* (Pp. 340-350). Philadelphia, PA: Lippincott, Williams & Wilkins.

15) Gastroesophageal Reflux Disease (GERD) Treatment: Procedures At-A-Glance. Dr, Dengler, RefluxMD Medical Director. www.refluxmd.com

16) Fass, R., Dickman, R. **Nonerosive reflux disease.** *GI Motility online* (2006) doi:10.1038/gimo42

17) Spechler, S.J. (2004). Nonachalasia Esophageal Motility Abnormalities. In J. E. Donald O. Castell, *The Esophagus, 4th Edition* (Pp. 262-272). Philadelphia, Pa: Lippincott, Williams & Wilkins.

96

18) Vaezi, M. F. (2013). New Tests for the Evaluation of Laryngopharyngeal Reflux.Gastroenterology & Hepatology, 9(2), 115–117.

19) Rodriguez, L., Rodriguez, P., Gómez, B., Ayala, J. C., Oksenberg, D., Perez-Castilla, A., ... & Crowell, M. D. (2013). Long-term results of electrical stimulation of the lower esophageal sphincter for the treatment of gastroesophageal reflux disease. Endoscopy, 45(8), 595-604.

20) Hunter, J. G., Kahrilas, P. J., Bell, R. C., Wilson, E. B., Trad, K. S., Dolan, J. P., ... & Burch, M. A. (2015). Efficacy of transoral fundoplication vs. omeprazole for treatment of regurgitation in a randomized controlled trial.Gastroenterology, 148(2), 324-333.

21) Spechler, S.J., Barrett's esophagus. GI Motility online (2006)doi:10.1038/gimo44

22) Alberta Provincial Gastrointestinal Tumour Team. Management of patients with early esophageal cancer, dysplastic and non-dysplastic Barrett's esophagus. Edmonton (Alberta): CancerControl Alberta; 2014 Mar. 19 p. (Clinical practice guideline; no. GI-011).

23) Johnston, M.H.,(2004). Esophageal Strictures. In J. E. Donald O. Castell, The Esophagus, 4th Edition (Pp. 507-515). (Philadelphia, PA: Lippincott, Williams & Wilkins.

24) www.medpix.com

25) Kahrilas, P.J., Pandolfino, J.E. Hiatus hernia.. GI Motility online (2006)doi:10.1038/gimo48

26) Lundell, L.G., Reflux esophagitis and peptic strictures. GI Motility online. (2006) doi:10.1038/gimo43.16. May 2006.

27) Wani, S. Sharma, P. Barrett's adenocarcinoma. GI Motility online (2006) doi:10.1038/gimo45

97