

A Review of Laryngopharyngeal Reflux

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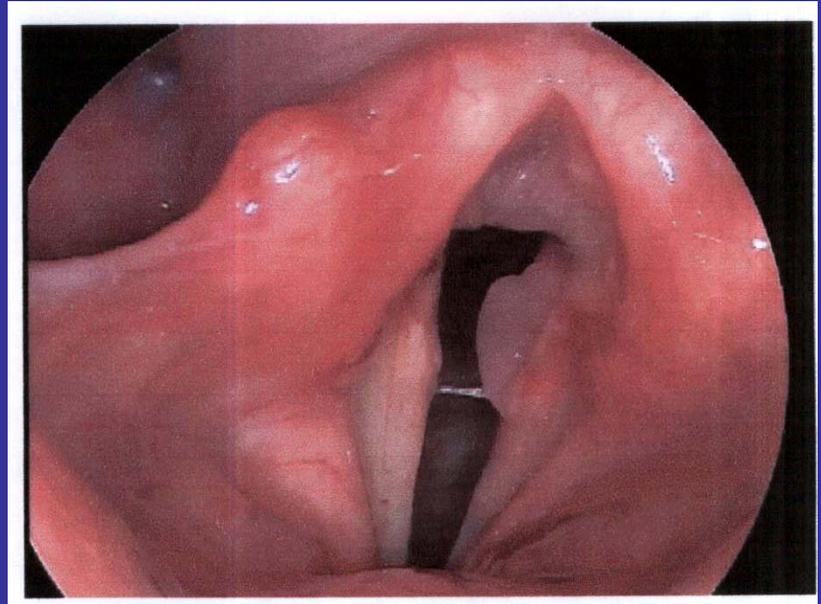


Objectives

- To present and discuss a case involving laryngopharyngeal reflux (LPR)
- To review the prevalence and presentation of LPR
- To differentiate between LPR and GERD
- To discuss the diagnosis and management of LPR
- General open discussion

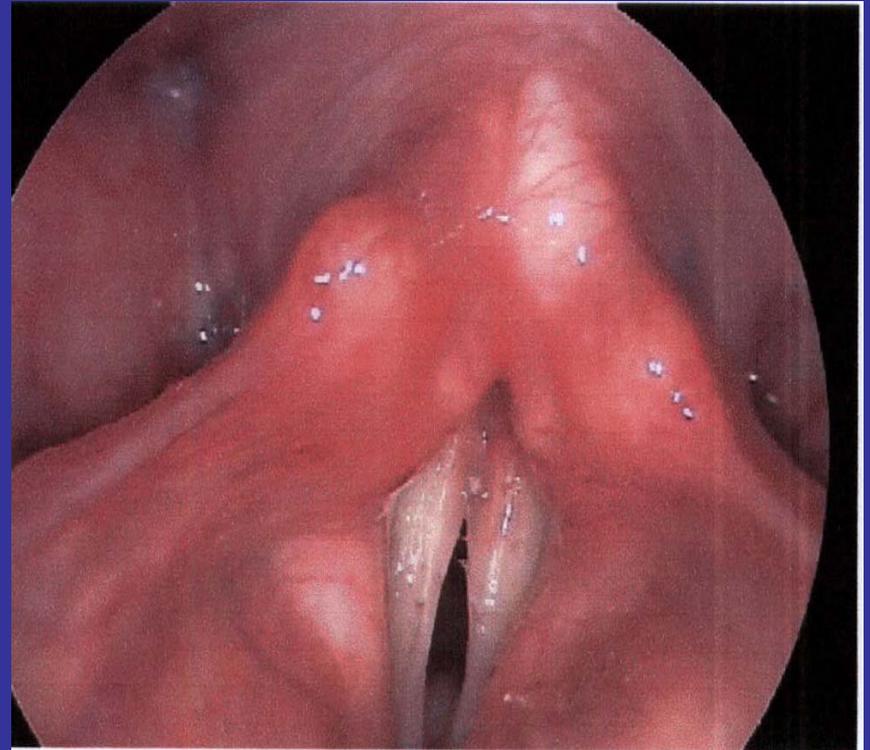
Case Presentation

- 52 yo male with 2 month history of globus sensation worse with coughing or swallowing
- Has periodic heartburn
- No dysphonia
- Smokes cigars occasionally



Case

- Flexible laryngoscopy showed normal cord mobility but hyperfunctioning on videostroboscopy and incomplete closure.



Treatment

- Started on Pantoprazole 40mg po od
- Discussed lifestyle modification
- Lesion persisted so booked for OR
- Microlaryngoscopy and excisional biopsy of lesion done.

Outcome

- Ultimately had excised, base of lesion removed with CO2 laser and then injected with Kenalog.
- Referred for speech therapy
- Placed on Pantoprazole 40mg po bid but poor compliance.
- Now on Nexium od maintenance therapy after a 3 month course of Nexium bid.

Case 2

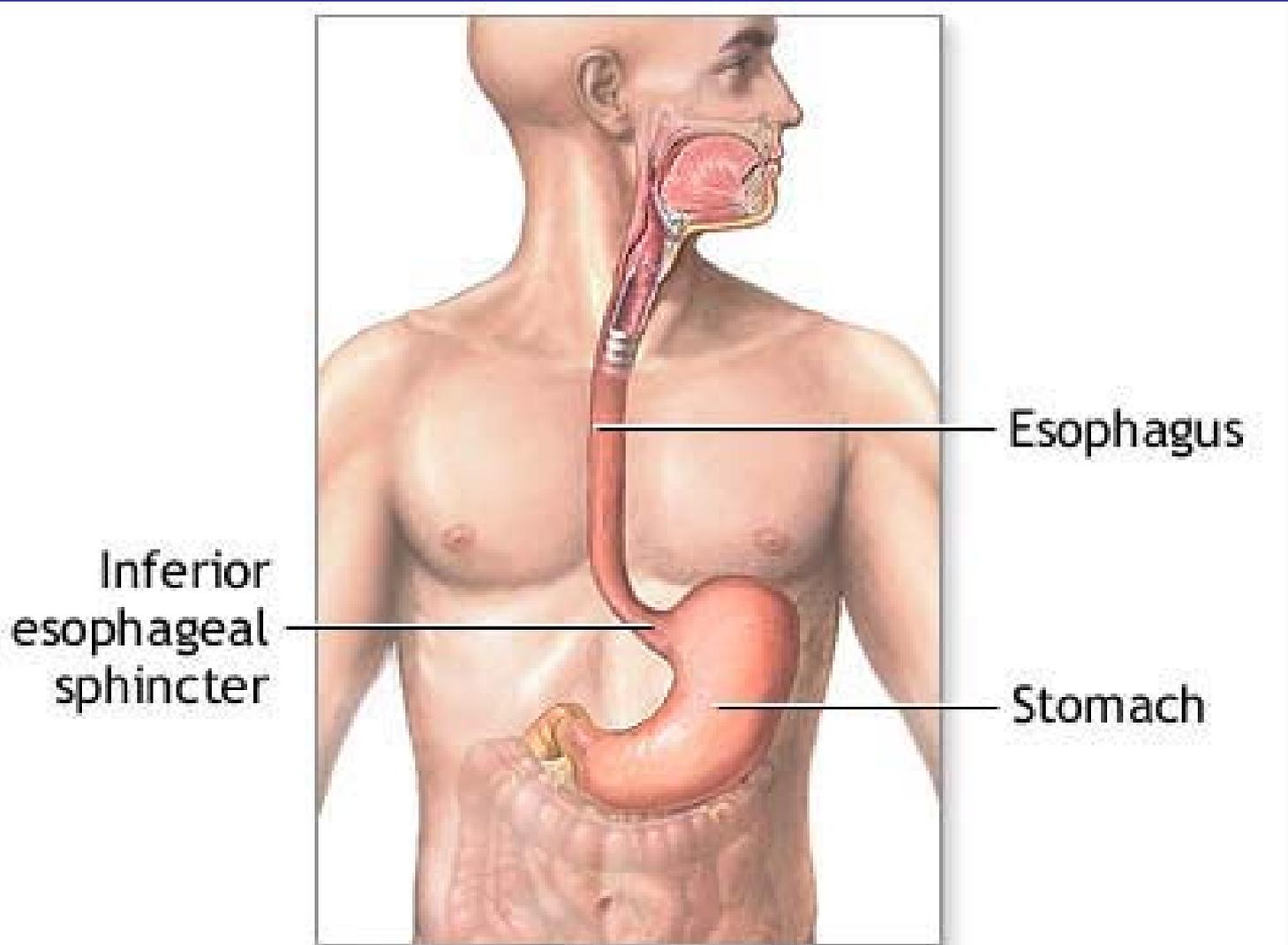
- 50 yo female presents to the ER with sternal chest pain, persistent cough
- Neck soft Tissue finds free air in the cervical esophagus.
- Pt was kept NPO, started on Clindamycin IV, and subsequently started on Nexium bid.

- Review of past history reveals a long history of a persistent cough for many years despite quitting smoking 2 years previously.
- Patient admits to chronic throat clearing, globus sensation and heartburn, with raspy voice.

- Flexible nasopharyngoscopy found extensive pachyderma, arytenoid erythema, normal mobility of vocal cords.
- After treatment with IV antibiotics and advanced to normal diet, the patient was started on Nexium bid long term with no further symptoms for over a year.

LPR: What is it?

Gastric acid washing up onto the laryngeal and pharyngeal mucosa



Prevalence

- Koufman et al
 - 113 consecutive patients with laryngeal and voice disorders
 - 78/113 (69%) had symptoms and signs of LPR
 - 57/78 (73%) had an abnormal pH study
 - Conclusion: LPR occurs in at least 50% of patients with laryngeal and voice disorders

Presentation

- Hoarseness/dysphonia 71%
- Chronic cough 51%
- Globus pharyngeus 47%
- Chronic throat clearing 42%
- Dysphagia 27%
- Heartburn present in 6%-43%

Current Perspectives on LPR

- **Book et al**
 - Discern current practices of otolaryngologists
 - Symptoms most related to reflux
 - Throat clearing (98.3%)
 - Persistent cough (96.6%)
 - Globus sensation (94.9%)
 - Dysphonia (94.9%)
 - Most common diagnostic test
 - Fiberoptic laryngoscopy (75.7%)
 - Most common adjunctive test
 - Double pH probe test (37.2%)

LPR vs GERD

- As few as 3 episodes of reflux per week can cause damage
- pH of up to 5 considered damaging to the laryngopharynx
- 100 times more sensitive to acid exposure
- No protection from acid exposure.
- Up to 50 episodes of GER/24 hrs considered normal.
- Prolonged exposure of acid, pepsin at pH <4 required for damage
- Bicarbonate, peristalsis, mucosal barrier protect esophagus.

LPR: Common associations

- Asthma
 - 70% of asthmatics exhibit reflux symptoms and abnormal results on pH monitoring
- Subglottic stenosis
- Globus Pharyngeus
- Laryngospasm
- Laryngeal Cancer
- Sinusitis
- Acute otitis media

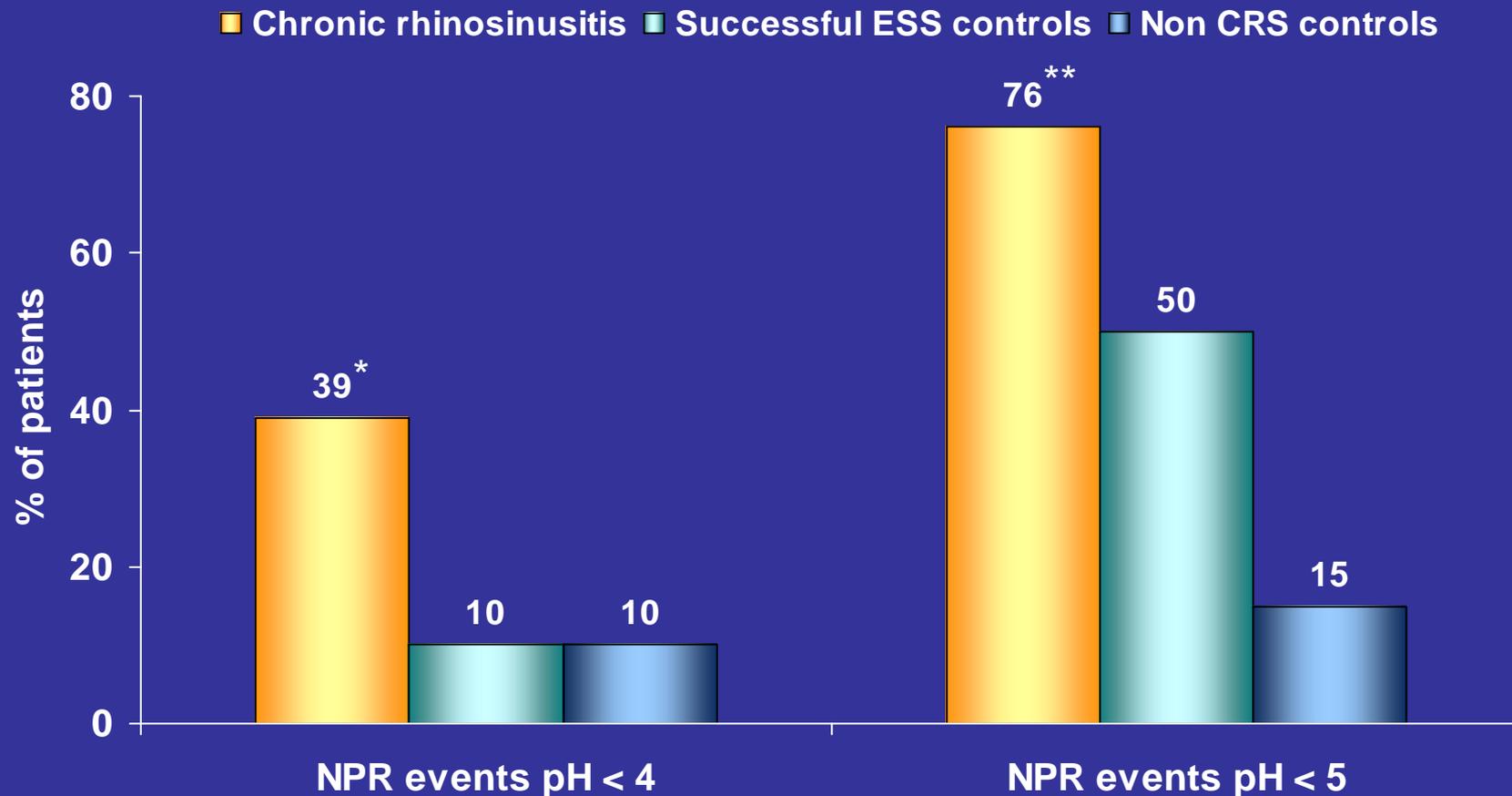




Prevalence of Reflux in Patients with Chronic Rhinosinusitis

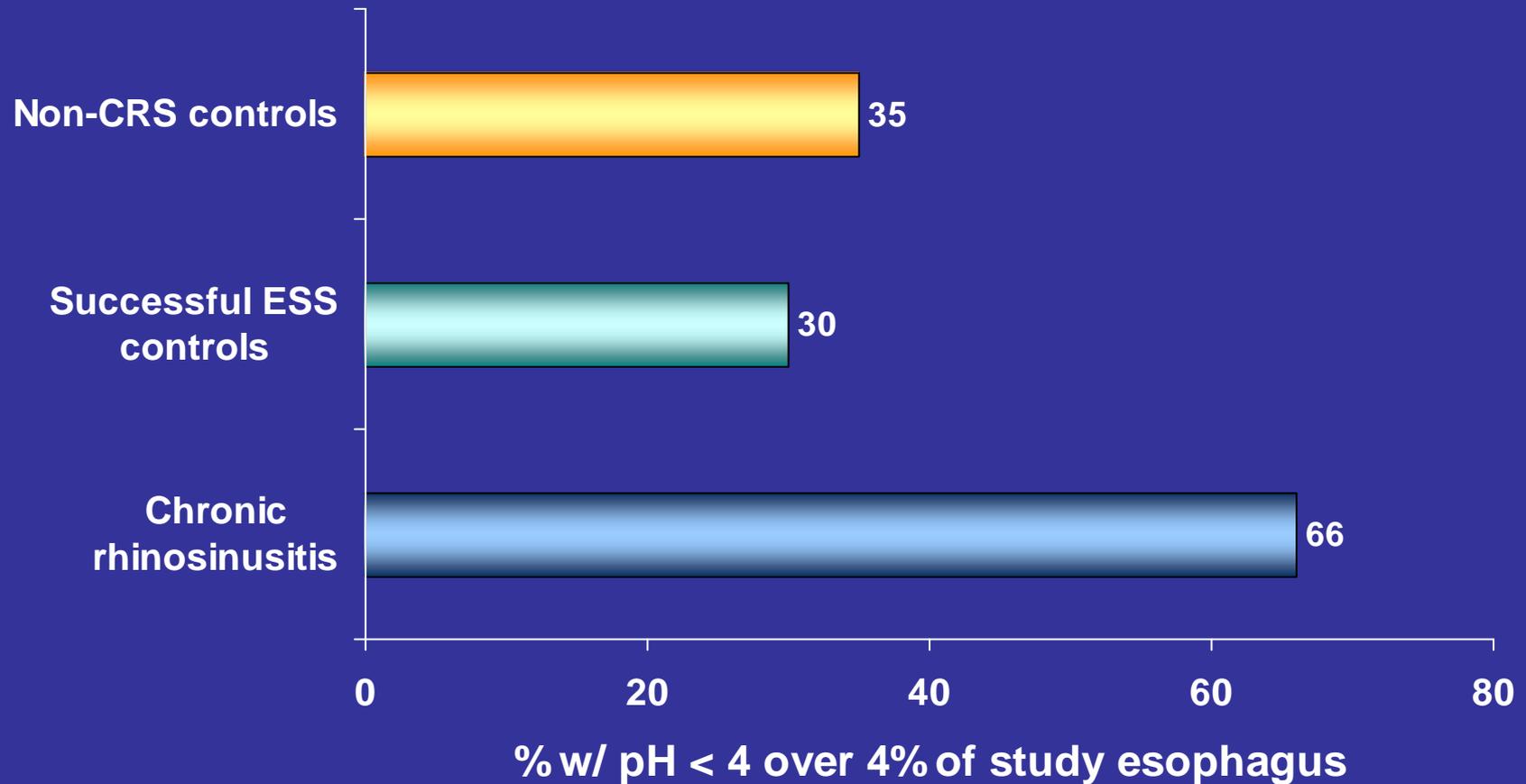
- **Objective:** To determine whether there is a difference in the prevalence of reflux in patients with refractory chronic rhinosinusitis (CRS) compared to controls
- **Patients:**
 - Study group: 38 patients w/ history of ≥ 1 endoscopic sinus surgery with continued CRS symptoms & mucosal inflammation
 - Control group 1: 10 patients w/ ≥ 1 ESS procedure & no symptoms of CRS or mucosal inflammation
 - Control group 2: 20 subjects w/ no history of CRS or sinus surgery
- **Assessments:** Reflux symptom scales, 20-item sinonasal outcome test, sinusitis symptom scale, nasal endoscopy, 24 hour pH study

Nasopharyngeal Reflux Events in Chronic Rhinosinusitis



* $p = 0.004$ vs. controls; ** $p = 0.00003$ vs. controls
DelGaudio JM: *Laryngoscope* 2005; 115(6):946-57.

Pathologic Reflux in the Esophagus





Reflux in Patients with Chronic Rhinosinusitis: Conclusions

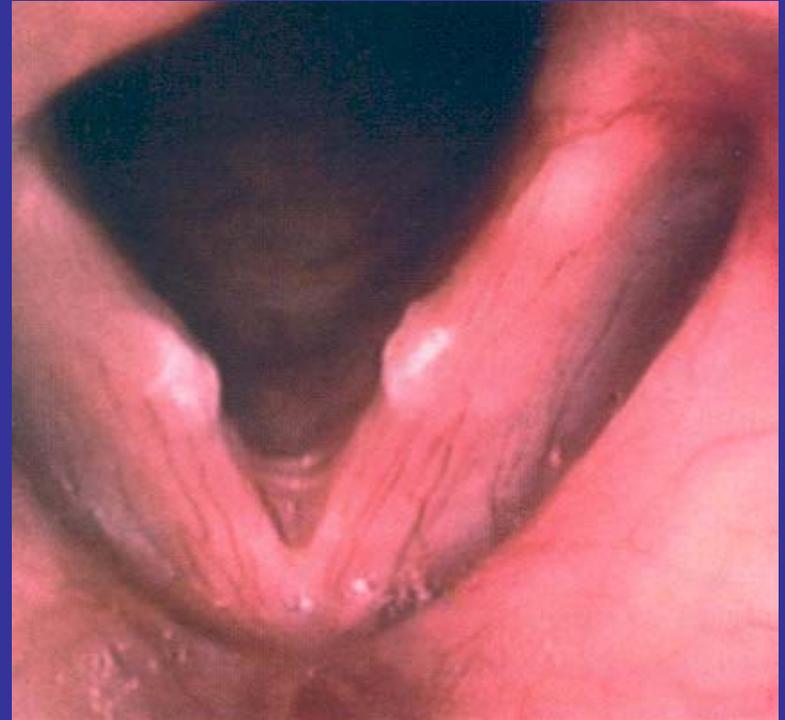
- Compared to controls, patients with persistent CRS after ESS have more reflux at:
 - The nasopharynx
 - The upper esophageal sphincter
 - The distal esophagus
- Greatest difference is in nasopharyngeal reflux, especially pH less than 5
- Nasopharyngeal reflux is likely an important causative factor of refractory CRS

LPR: Testing

- Laryngoscopy
- 24 hr ambulatory pH probe monitoring
- Esophagoscopy
- Esophageal manometry
- Esophagoscopy
- Intraluminal impedance manometry
- Empiric therapy
- Barium Swallow?

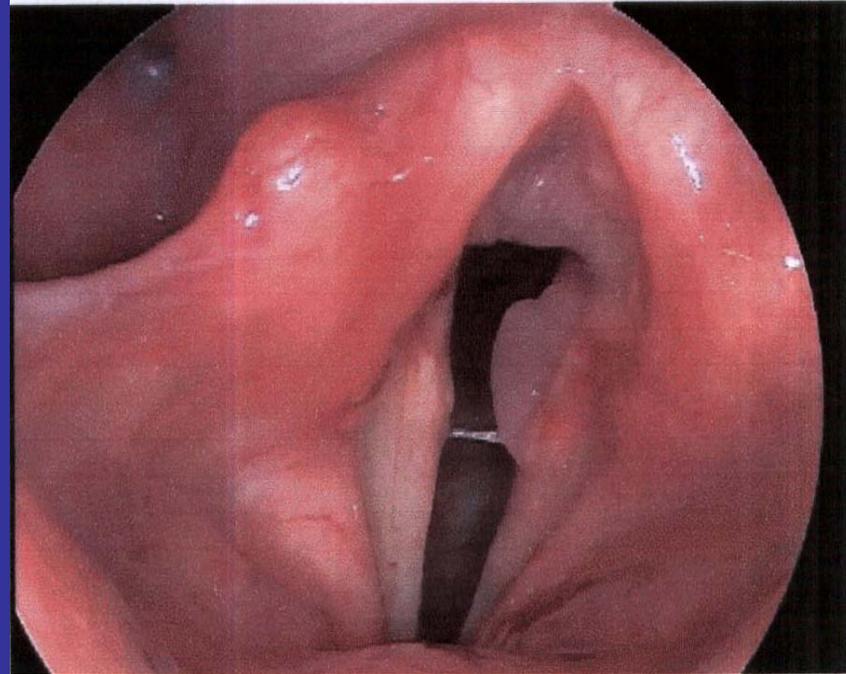
Clinical findings on Laryngoscopy

- Erythema/hyperemia
- Vocal fold edema
- Diffuse laryngeal edema
- Posterior commissure hypertrophy
- Ventricular Obliteration
- Granuloma
- Thick endolaryngeal mucus
- Pseudosulcus

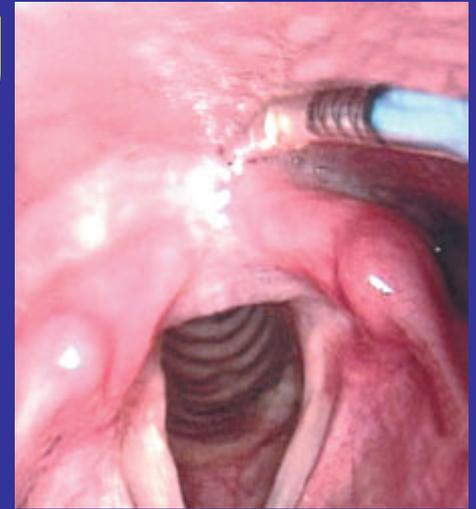


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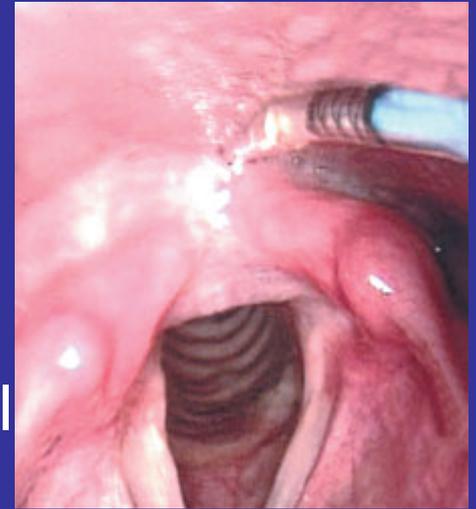
pH probe testing



- Placed by esophageal Manometry or direct visualization.
- 5cm above LES and just above cervical esophagus
- Difficult to place probe in ideal position in the hypopharynx and esophagus
- Debate over correct placement of upper probe
- pH of 5 felt to be damaging to the larynx vs pH 4 for esophagus
- Very brief window of time studied with 24 hour test
- Can be useful to guide therapy

Diagnostic Criteria

- A decrease in the pH to less than 4.0
- Decrease in the pharyngeal pH level immediately following distal esophageal acid exposure
- No decrease in the pH with eating or swallowing
- A rapid and sharp decrease in the proximal pH rather than a gradual change
- Not useful to predict severity of symptoms
 - » Laryngoscope 2002; 112(12)



LPR: Treatment

- Different than GERD
- Laryngeal mucosa is more susceptible to acid injury than esophageal mucosa
- Acid needs to be suppressed for 24 hours
- Bile and Pepsin also need to be considered

LPR: Management

- Lifestyle Modification
 - Smoking cessation
 - Alcohol cessation
 - Reduction in Caffeine
 - Avoidance of late night meals and liquids
 - Wt loss
- Medications
- Surgical: Nissen Fundoplication

Elevating the head while sleeping?



Role of H2 Blockers

- Only effective in 50% of cases
- Useful for tapering pt's off PPI therapy
- Not ideal for initial treatment of LPR

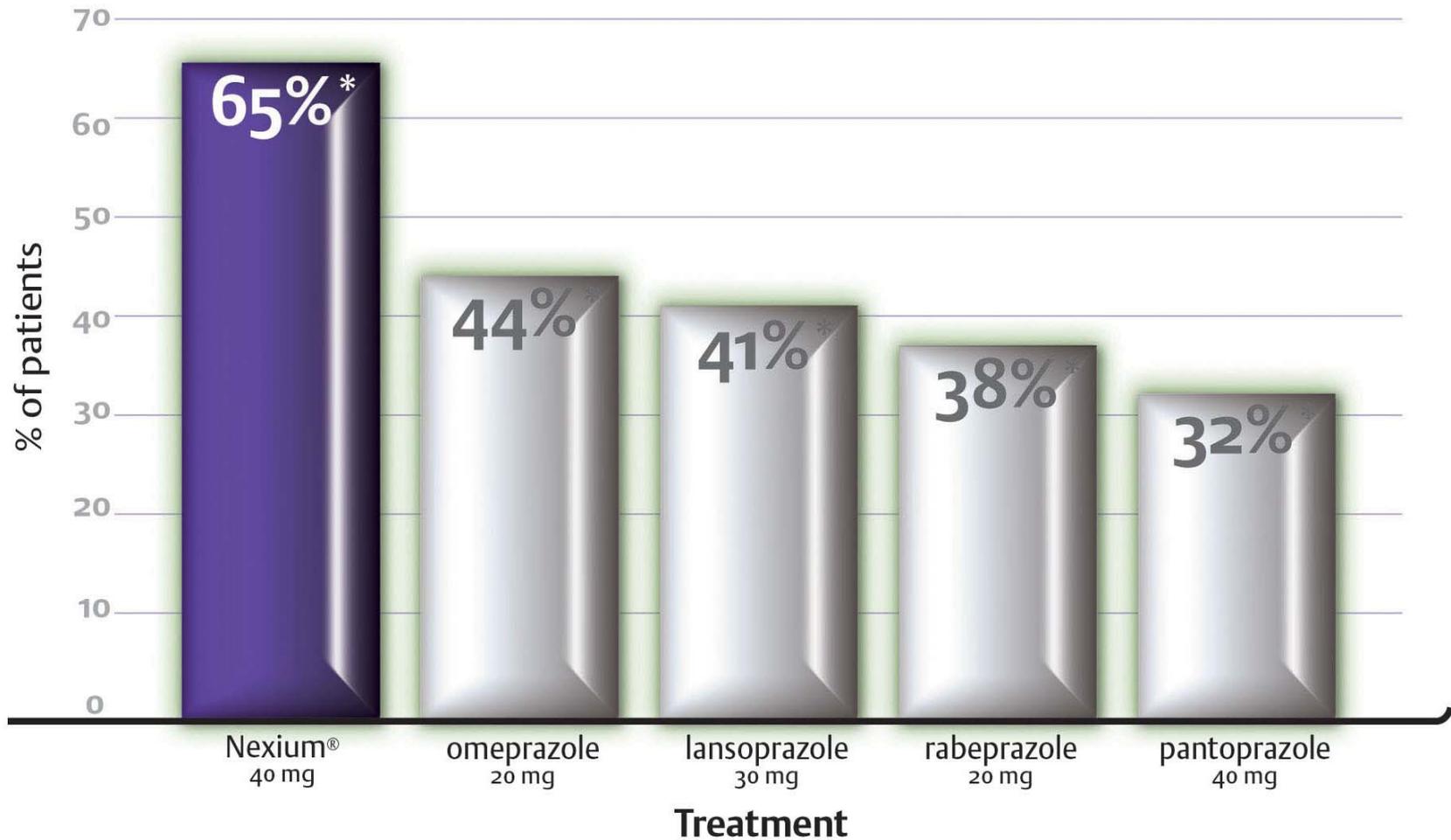
Medical Therapy: PPI's

- Still 10% failure rate reported
- Directly target H⁺-K⁺ ATPase, key enzyme for final acid pdn pathway in parietal cell.
- Reduce exposure of damaged tissues to acidic environment
- Reduces activity of Pepsin
- Also result in reduced gastric volume further reducing reflux.

LPR: Duration of Treatment

- Symptoms found to be improved at 2 months of therapy
- Laryngoscopic changes persistent until 4 months
- Recent studies suggest 6 months of therapy with PPI's and then tapering off medication.
- Lifetime treatment for some.

% of patients with intragastric pH>4 for >12 hours



* Nexium vs. other PPIs ($p < 0.05$), $n = 34$

† 5-way crossover study of once daily-dosing for 5 days

Adapted from Miner *et al.*[†]

Medical Therapy: Role of Nexium

- **DelGaudio et al**
 - 30 patients treated with 40 mg od x 8 weeks
 - At 4 weeks
 - 8 patients had significant improvement in symptoms
 - At 8 weeks
 - 19 patients had significant improvement in symptoms
 - 4/10 nonresponders improved after increasing their dosage to bid

Surgical Management

- A consideration in patients younger than 40 who require long term therapy
- Surgical experience with laparoscopic technique essential
- 0.05% mortality rate
- Proportion of patients end up back on PPI's after about 5 years.

Conclusions

- LPR is a clinical diagnosis
- Barium Swallow test is not diagnostic
- Treatment can be protracted
- Maximal treatment benefit is achieved with lifestyle modification and with PPI's
- Nexium has been shown to have superior acid suppression to other PPI's.

Case

- 5 year old female presents with otorrhea from left ear to my office.
- Patient otherwise well, no systemic complaints.
- Tubes placed 3 months ago for chronic otitis media.
- Seen recently at a walk in clinic and prescribed Amoxil.
- No improvement noted.

Ideal treatment ?

- This patient should have been started on topical antibiotic drops.
- Ciprodex or Cipro HC with no oral antibiotics in this case.
- The Journal of Otolaryngology, Volume 34, Supplement 2, August 2005

Use of Otological vs Systemic Antibiotics

- Otological antibiotics
 - All cases of uncomplicated AOMT
- Systemic antibiotics
 - Systemic illness
 - Complicated otitis media (ie mastoiditis)
 - Associated strep pharyngitis
 - Diabetic and immunocompromised patients
 - Failure of topical therapy

Ototoxicity

- No reported ototoxicity in animal or human studies with fluoroquinilones
- All other ototopical agents may be ototoxic in humans.
- Peter s. Roland Et al Consensus Panel on Role of potentially ototoxic antibiotics for topical middle ear use. Otolaryngology-Head and Neck Surgery. 2004; 130:S51-S55

Case

Pathology

- Some atypical dyskeratotic squamous cells present and inflammatory cells
- Referred for opinion from another pathologist in Hamilton; diagnosed with squamous cell carcinoma in-situ.
- Re-biopsied with same results but clinically consistent with Granuloma

Barium Swallow for LPR?

- Useful if patient complains of dysphagia
- Symptoms of regurgitation
- Suspected stricture
- Esophagitis
- Zenker's diverticulum
- Normal study does not rule out LPR

LPR: Different from GERD

Table. Summary of typical differences between GERD and LPR*

	GERD	LPR
Symptoms		
Heartburn and/or regurgitation	++++	+
Hoarseness, cough, dysphagia, globus	+	++++
Findings		
Esophagitis	++++	+
Laryngeal inflammation	+	++++
Test results		
Erosive or Barrett's esophagitis	+++	+
Abnormal esophageal pH monitoring	++++	++
Abnormal pharyngeal pH monitoring	+	++++
Esophageal dysmotility	+++	+
Abnormal esophageal acid clearance	++++	+
Pattern of reflux		
Supine (nocturnal) reflux	++++	+
Upright (daytime) reflux	+	++++
Both	+	++
Response to treatment		
Effectiveness of dietary and lifestyle modifications	++	+
Successful treatment with a single-dose PPI [†]	+++	+
Successful treatment with a twice-daily PPI	++++	+++

Clinical manifestations reported to be related to LPR

- **Laryngeal**

- Reflux laryngitis
- Subglottic and tracheal stenosis
- Carcinoma of the Larynx
- Endotracheal intubation injury
- Contact ulcers and granulomas
- Arytenoid fixation
- Paroxysmal laryngospasm
- Vocal fold Nodules
- Polypoid degeneration
- Laryngomalacia
- Recurrent respiratory papillomas
- Pachydermia laryngis
- Recurrent leukoplakia

- **Pharyngeal**

- Globus pharyngeus
- Chronic Sore throat
- Dysphagia
- Zenker's Diverticulum



- **Pulmonary**

- Chronic cough
- Exacerbation of asthma/COPD
- Bronchiectasis
- Aspiration pneumonia

- **Miscellaneous**

- Sudden infant death syndrome
- Sinusitis
- AOM
- Dental erosions
- OSAS

Dietary Modification

- Behavioral dietary modifications shown to be most effective
 - Avoidance of food and liquid before sleep
 - Elevation of head of bed (only for about 20% is this helpful)
 - Type of foods had little effect on reflux

Compliance

- Giacchi RJ et al did a prospective survey on 30 patients with symptoms and findings consistent with LPR
- Followed for 4 months
- Looked at survey and medication renewal from pharmacies
- 80% improved but only 50% took medications as prescribed
- Degree of symptomatic improvement significantly correlated with medication and behavioral compliance.

Medical Therapy: Placebo Effect

- Noordzij et al
 - 53 patients with >1 LPR symptom were recruited and underwent pH study
 - 30 patients with >4 episodes LPR events enrolled
 - 15 patients received 40 mg Losec bid, 15 received placebo for 2 months
 - Symptoms of hoarseness/throat pain/globus/clearing/cough/dysphagia and odynophagia were monitored
 - Both groups improved in most symptoms with hoarseness and throat clearing improving more in the treatment group

LPR: Treatment Regimen

- Start with twice daily dosing
 - AM dose before breakfast
 - PM dose before evening meal
- Reevaluate at 2-3 months
- Repeat laryngoscopy at 4-6 months
 - If failing arrange for pH monitoring
- Minimum length of therapy is at 6 months
- At 6 months replace with H2 blocker first at night and then in the morning alternatively may reduce PPI dosing to once daily

Treatment

Reduce acid exposure for 24 hours

pH > 5 ideal for LPR

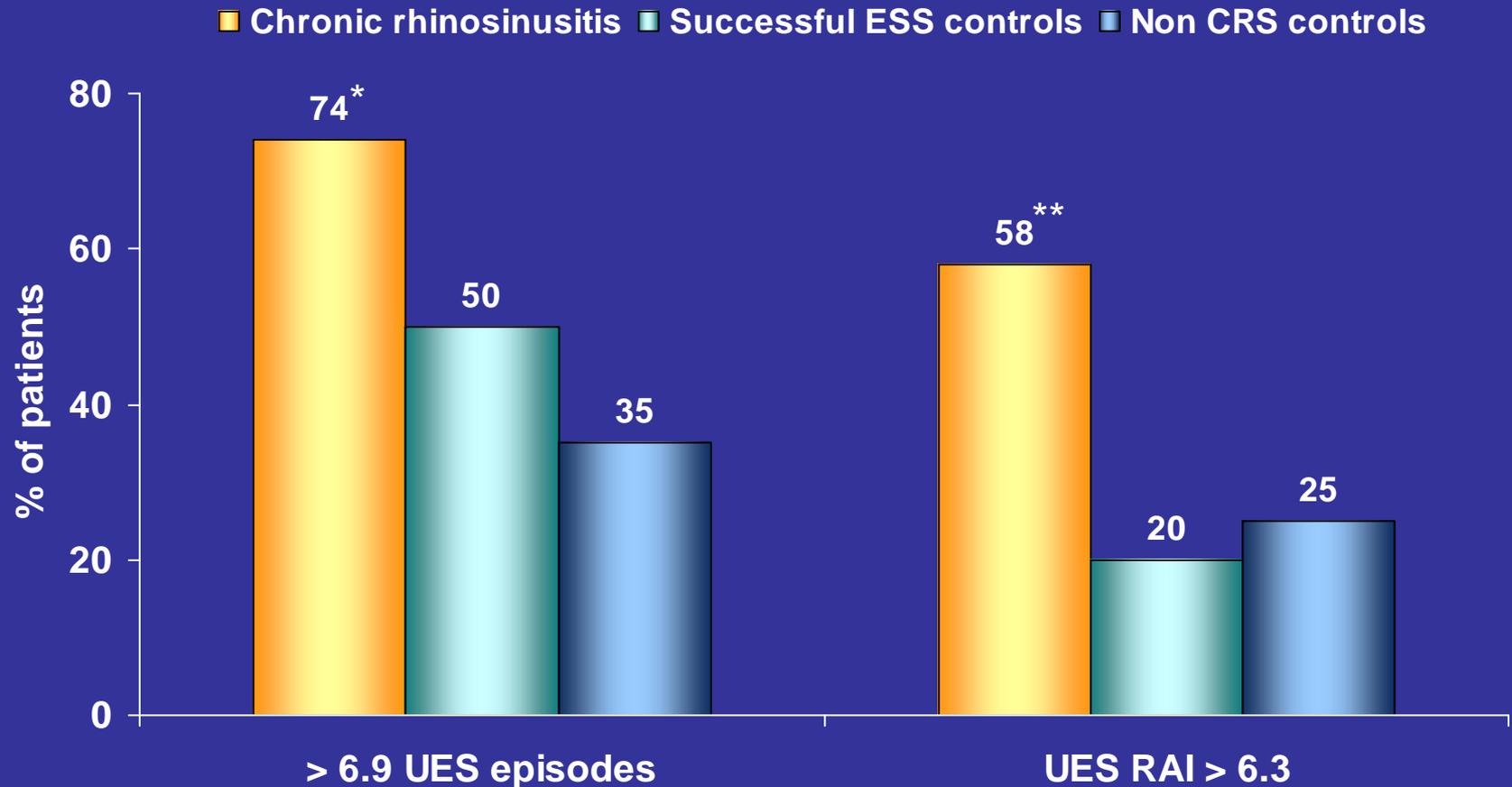
Reduce reflux of stomach contents

Bile

Pepsin

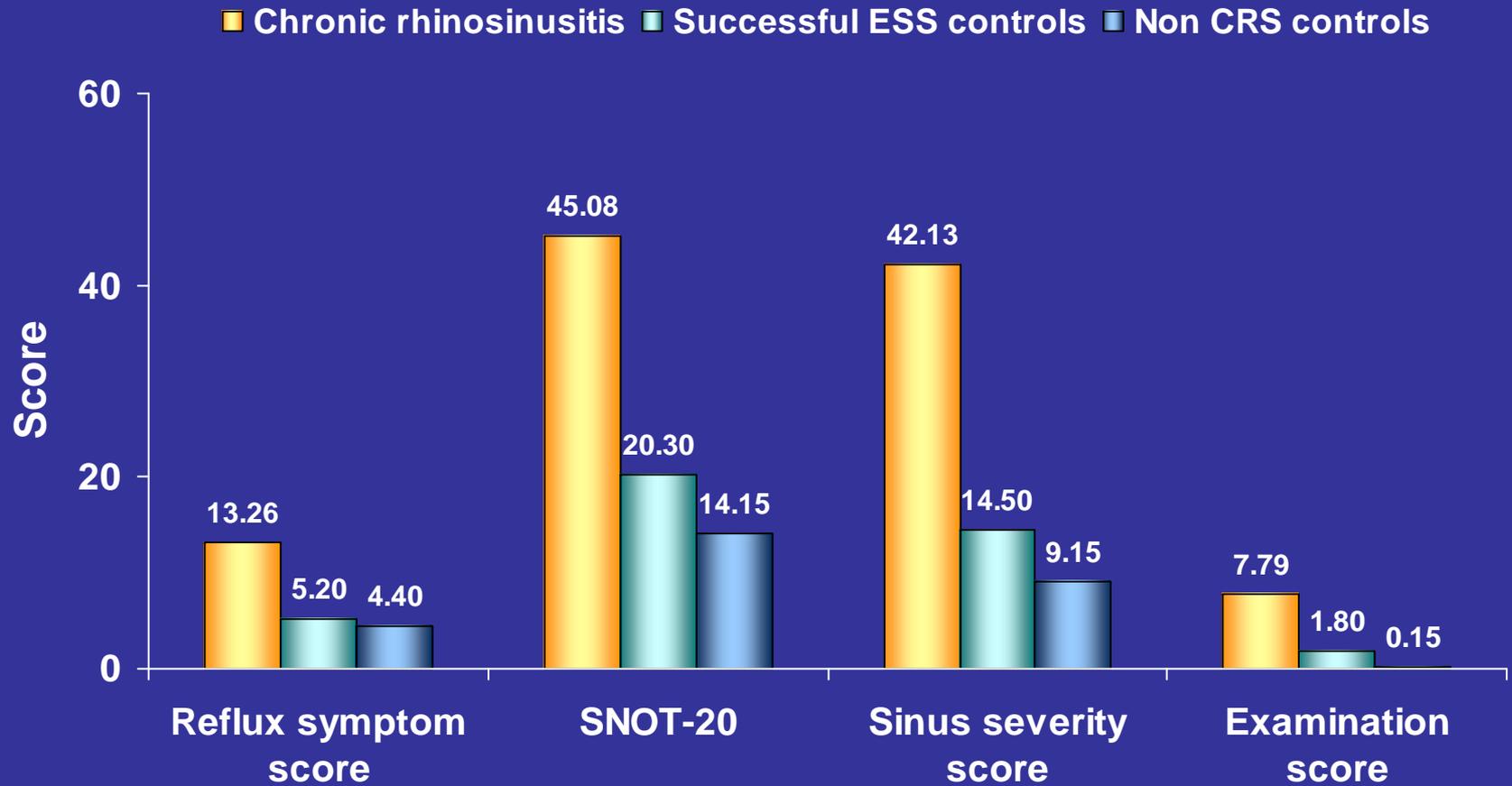
Acid

Pathologic Reflux at the Upper Esophageal Sphincter



* $p = 0.006$ vs. controls; ** $p = 0.007$ vs. controls
DelGaudio JM: *Laryngoscope* 2005; 115(6):946-57.

Symptom and Examination Scores in CRS vs. Controls



$p < 0.01$ for all comparisons

DelGaudio JM: *Laryngoscope* 2005; 115(6):946-57.