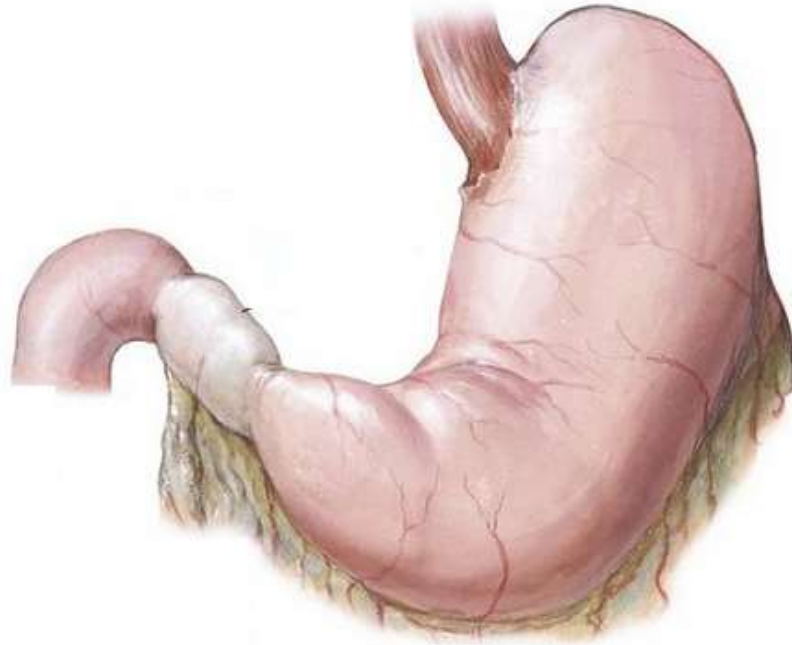


# Infantile Hypertrophic Pyloric Stenosis



**Samuel Negash, M.D.**

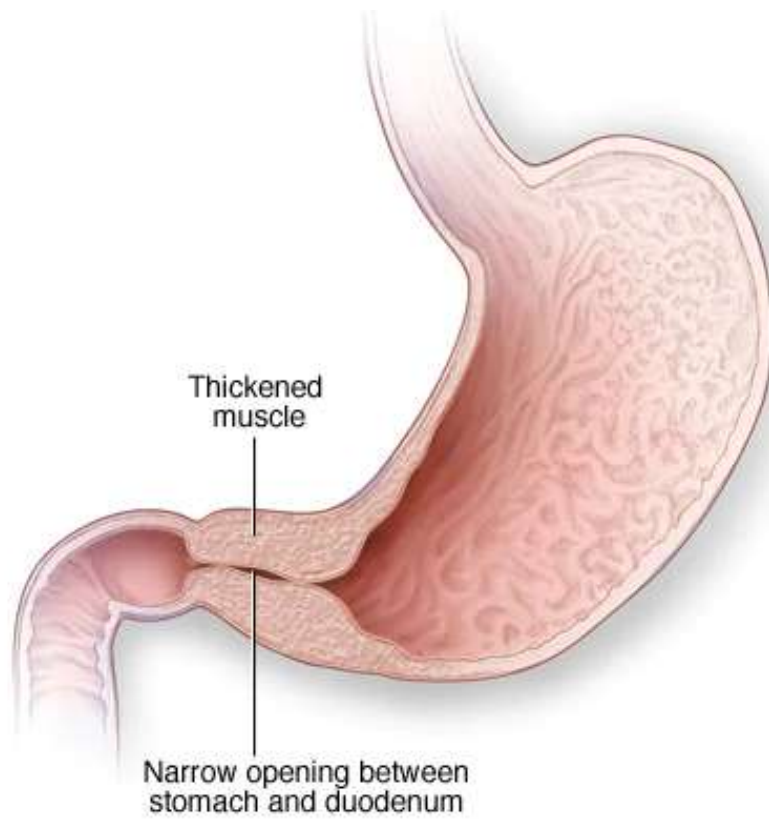
Pediatric Surgery Resident

Addis Ababa University

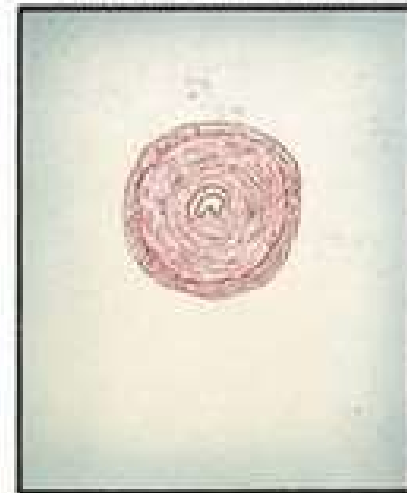


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# Pathology



Occlusion of pyloric lumen in cross section



# Epidemiology



4x More common in males



Preterm infants



30% in First born

- 
- **1 in 600 infants.** More common in whites

# Risk factors

Maternal smoking



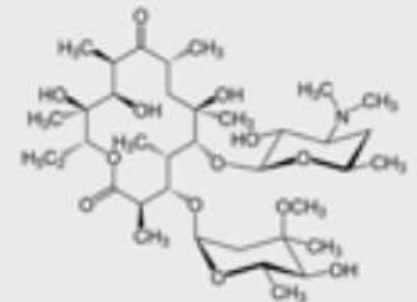
Bottle feeding



Genetic component



Use of erythromycin/  
azithromycin

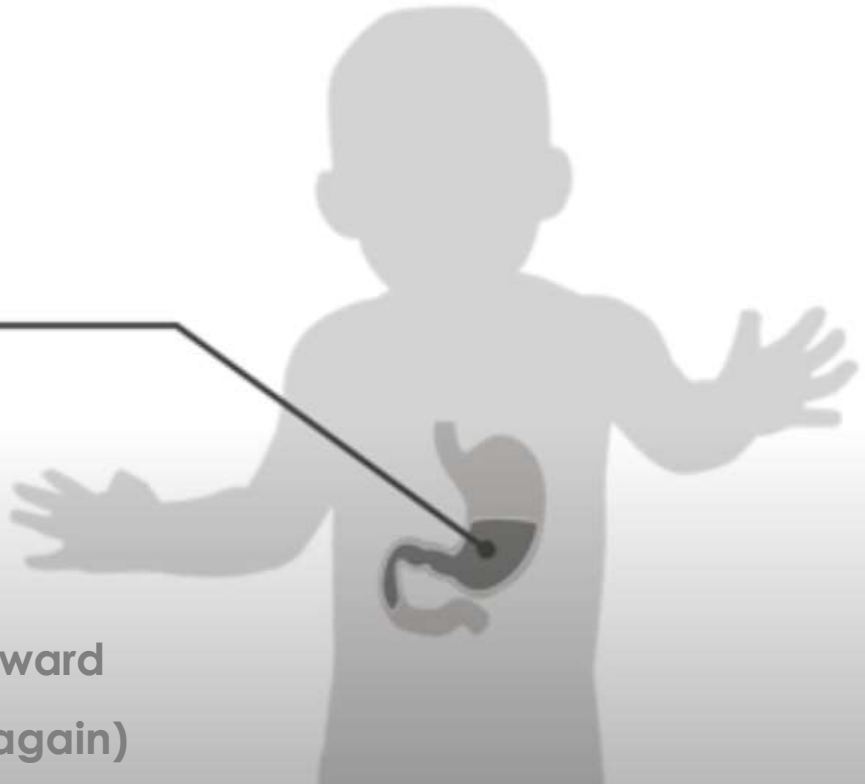


- **Etiology is unclear. Association found** with environmental factors. Genetic predisposition inferred from race and sex predilection.

# Presentation

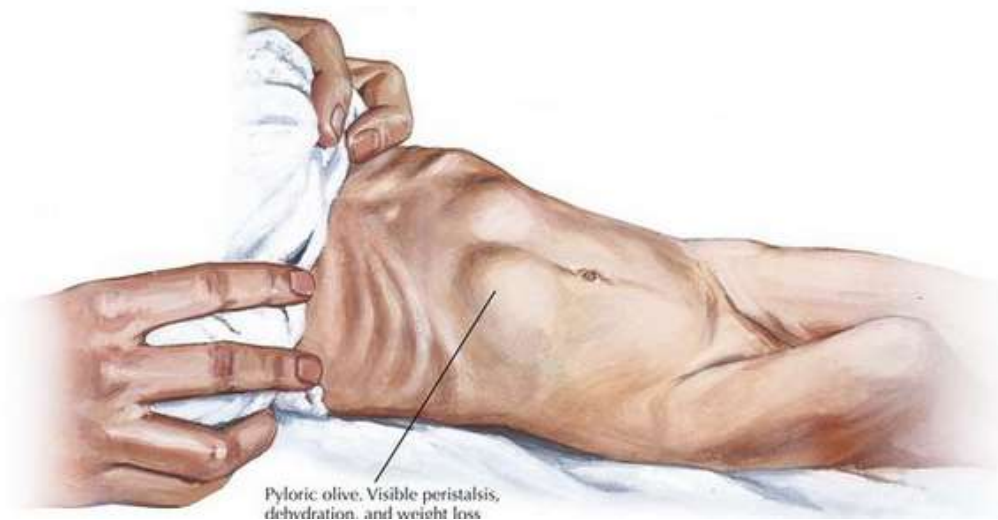
## Vomiting

- Postprandial
- Non-bilious
- “Projectile”
- Hungry afterward  
(wants to feed again)



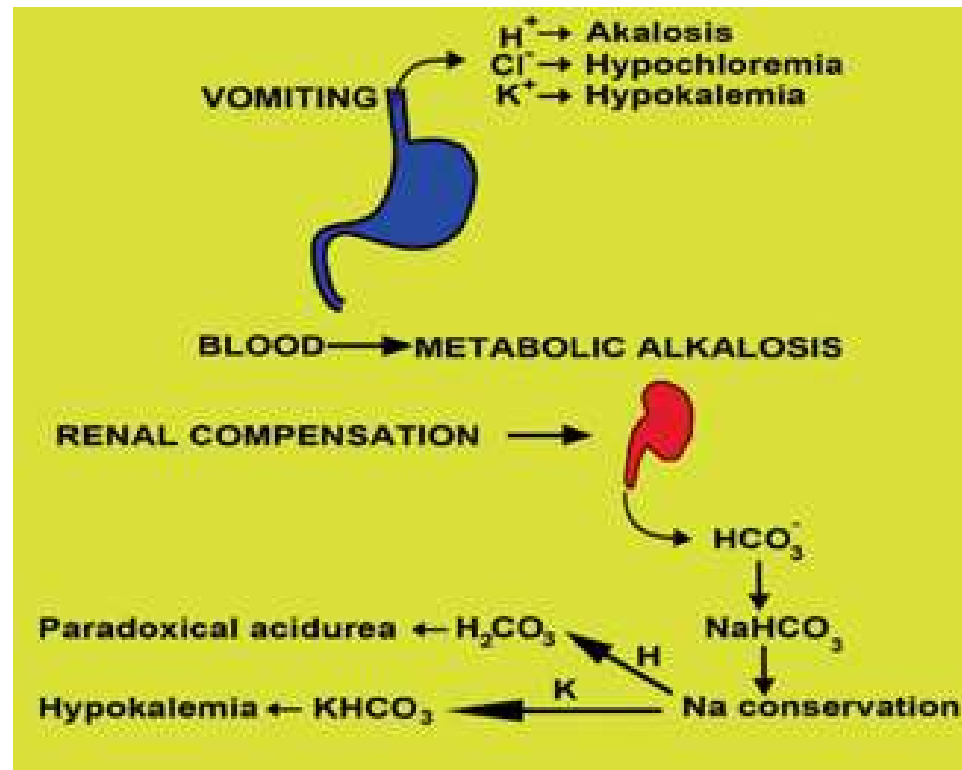
- **Symptoms start in 2-8 wks of life.** May not be projectile and difficult to d/t from GERD. Bilious vomiting doesn't rule out IHPS .

# Physical



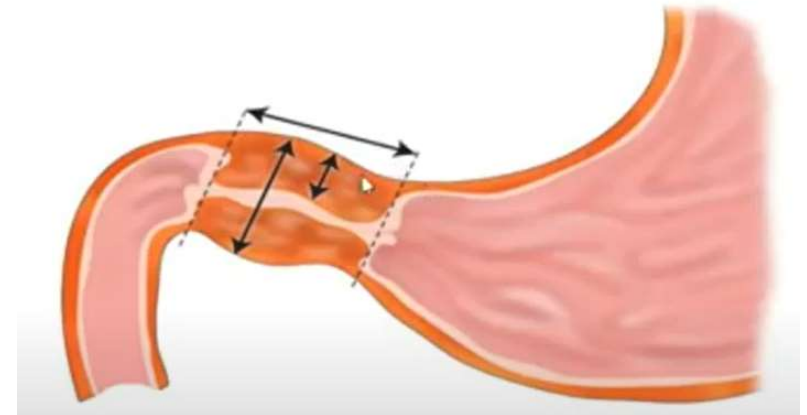
- **Olive mass** in upper abdomen can be palpated in upto 90%, Signs of malnutrition. signs of dehydration (sunken fontanells, lethargy). Unconjugated Jaundice (icteropyloric syndrome) can be found in upto 14% and resolve soon after surgery.

# Labs



- **Low** – chlorine, potassium
- **High** –  $HCO_3$  (serum), H (urine)

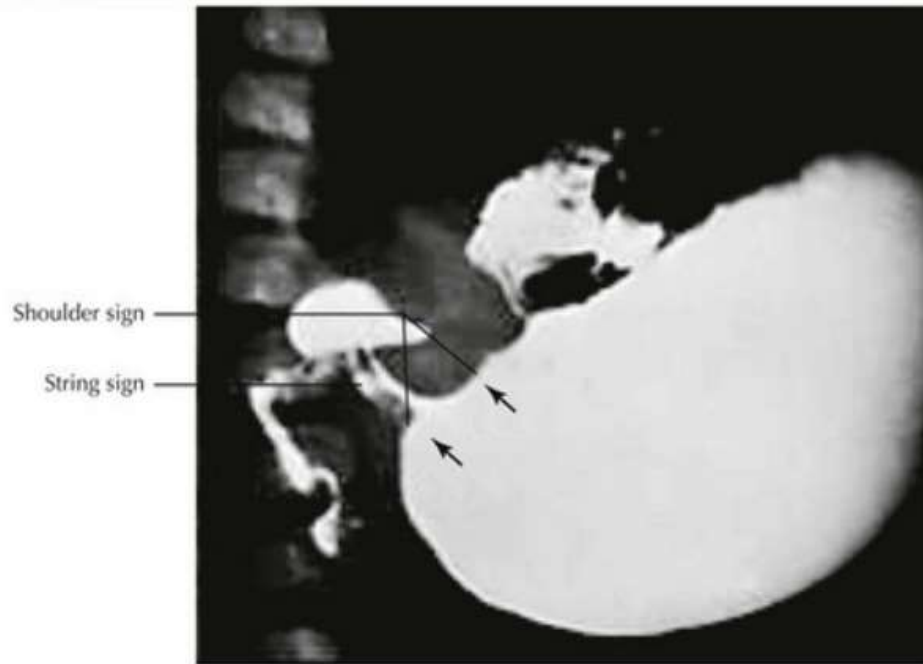
# Ultrasound



## Target sign

- Length  $>15\text{mm}$
- Single muscle thickness  $>3\text{mm}$
- Transverse diameter/width  $>13\text{ mm}$

# Barium meal



- **If ultrasound is equivocal**, upper GI series can be helpful to confirm diagnosis. Narrow pyloric canal (string sign, double track, shouldering). Indentation of hypertrophied muscle on lesser curvature

# Resuscitation

## **Alkalosis leads to dec resp drive (prolonged intubation & apnea)**

- Stop feeding, NG tube aspiration
- Correct dehydration (10-20ml/kg bolus NS)
- Correct electrolyte (1.5-2x MF)

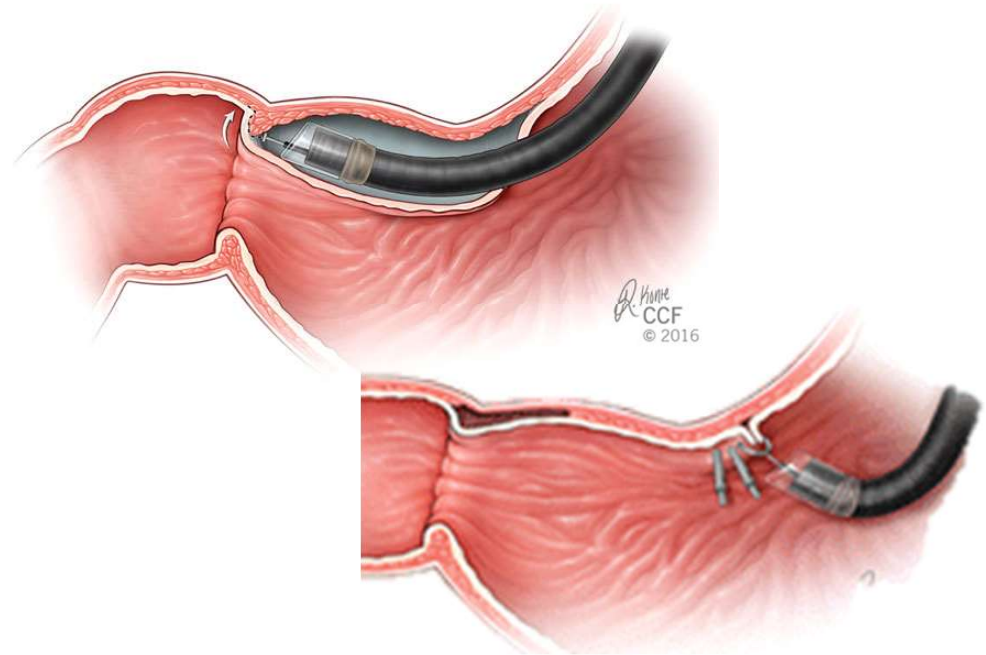
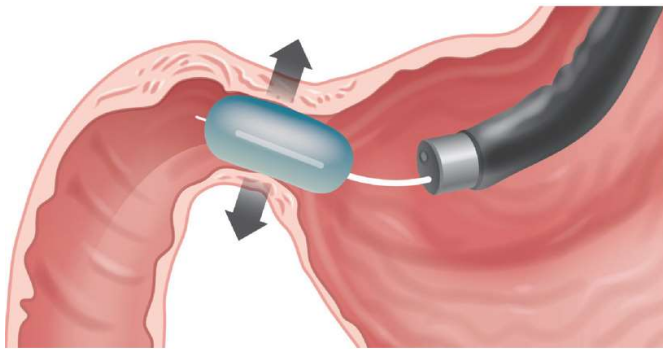
Most surgeons use the serum carbon dioxide (<30 mmol/L), chloride (>100 mmol/L), and potassium as marker of adequate resuscitation

# Conservative management



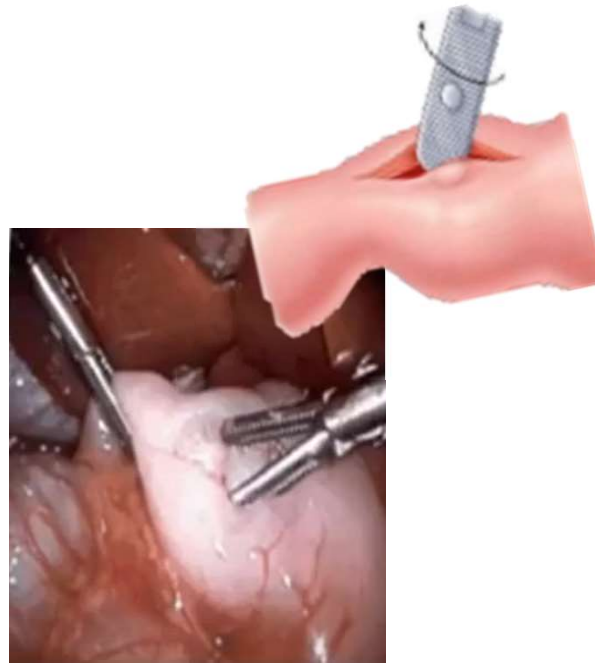
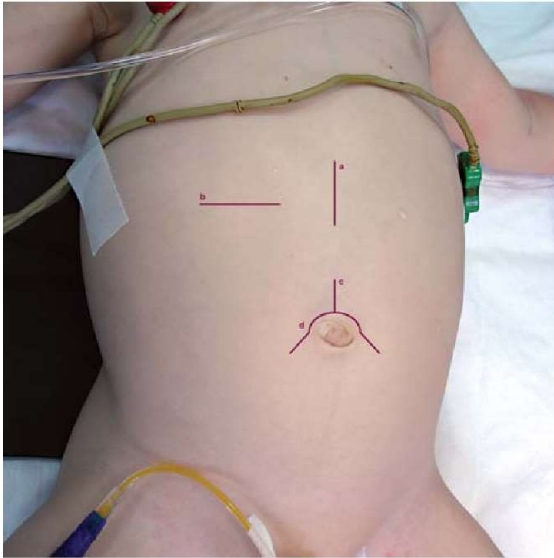
- **Anticholinergic (IV or PO atropine sulfate) is currently not recommended** since surgery is safe and effective. Typically trial involves nasoduodenal feedings for several months until the obstructive process resolves. ~75% effective

# Endoscopic management



- **Balloon dilatation is reserved for patients who cannot tolerate anesthesia.** Not preferred because not reliably disrupt the seromuscular ring of the pylorus.
- **Endoscopic pyloromyotomy is a new endeavor in children that needs further studies.** submucosal tunnel is created and hypertrophied muscle incised using an electrocautery knife.

# Surgery



- **Ramstedt pyloromyotomy:** RUQ incision (scar enlarge) or circumumbilical incision with vertical incision on fascia (cosmetic). Deliver pylorus. Incise serosa longitudinally from gastric end (5mm proximal to thickened pylorus) to duodenal end (2 mm proximal to prepyloric vein). Split muscle with blunt dissection until mucosa bulge. Check completeness by moving each side of divided muscle separately. Leak can be checked by instilling air in NGT. Bleeding is generally self limited (venous)

# Postop care



## Postpyloromyotomy Feeding Schedule\*

Pedialyte, 30 mL orally every 3 hr × 1

Full-strength formula, 30 mL orally every 3 hr × 1

Full-strength formula, 45 mL orally every 3 hr × 2

Full-strength formula, 60 mL orally every 3 hr × 1

Full-strength formula, 75 mL orally every 3 hr × 1

Full-strength formula as desired

- **Feeding** can be resumed 4hr after surgery. Intolerance is common the first few times (pyloric edema, spasm, gastric atony, GER) but can feed through it. Most are discharged in 24-36 hrs. infants offered **ad lib feedings** tolerated full feedings sooner and had a shorter hospital stay compared to infants offered **incremental feeding schedule**, despite having more emesis episodes. *Patients who required more complicated resuscitation tend to take longer to reach full feeds.*

# Complications

**Overall complication 1-2%. Mortality is rare**

1. Mucosal perforation
2. Prolonged postop Vomiting
3. Wound infection
4. Incisional hernia
5. Continued postop bleeding

# 1. Mucosal perforation

- 1-2%
- Usually identified intraoperatively
- Most common site is duodenum
- **Prevention**- leave few pyloric muscles intact at duodenal end

**Management:** *laparoscopy may require conversion to open*

- Small perf at duodenal end – close defect. Bolster with omentum
- Big perforation or at middle – close myotomy and new myotomy at d/t site (90–180° from the original incision)
- NGT decompression and prolonged NPO (24 hr)

## 2. Persistent vomiting

- Modest regurgitation is common (80%) but vigorous vomiting is rare

Persistent vomiting (after 5 days) in 2-26%

- ✓ Commonly due to **GERD** (25%)
- ✓ can be due to **incomplete myotomy** (more in laparoscopic ~1%)
- ✓ Other – aggressive feeding, enteric viral infections

Challenges

- ✓ Upper GI series interpretation is difficult (swelling).
  - ✓ Ultrasound not useful (pyloric resolution takes 8mo-1yr)
  - ✓ Emesis in GER may persist with acid suppression (meds only dec pain)
- **Consider secondary pyloromyotomy if persist at 2 week**  
<https://dx.doi.org/10.1136/adc.54.11.886>

### 3. Wound infection

- similar to other clean operation (2%)
- Higher risk in
  - ✓ transumbilical approach (7%)
  - ✓ if perforation occurred
- Prophylactic antibiotic recommended for transumbilical approach

# Report from Ethiopia



*ISSN 2073-9990 East Cent. Afr. J. surg*



**Infantile Hypertrophic pyloric stenosis: A retrospective study from a Tertiary Hospital in Ethiopia**

**A. Tadesse<sup>1</sup>, A. Gadisa<sup>2</sup>,**

## **55 patients / 2 yr**

- M:F – 7:1
- Bottle feeding = 7%
- First born 56%
- 20% onset in first week
- Mean onset = 16d
- Mean duration = 27 d
- Palpable mass = 26%
- Dehydration = 50%
- Electrolyte abn = half

## **Outcome**

- 11% perforation
- 11% wound infection
- 4% pneumonia
- 2 deaths (4%)
  - 1 ? Aspiration
  - 1 unexplained

The End



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