

## PERSISTENT VOMITING IN THE NEONATE AND CHILD

- vomiting in the child is **NOT** normal
- bilious vomiting is **ALWAYS** significant until otherwise proven

### GASTRO-OESOPHAGEAL REFLUX

- more common in infancy than generally recognized
- majority (>90%) resolve spontaneously within the first year of life
- small percentage develop complications

Figure 1. Pathophysiology of Reflux

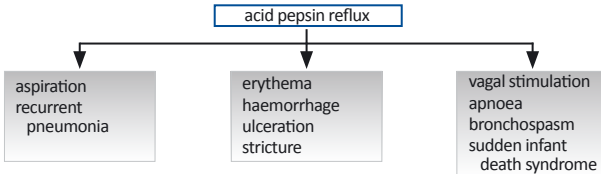


Table 1. Mechanisms of Reflux

#### Mechanisms preventing Reflux

##### Anatomical

- length and pressure of the lower and intra-abdominal oesophagus
- angle of His
- hiatal pinch of cock effect

##### Physiological

- coordinate effective peristaltic clearance
- normal gastric emptying

#### Factors causing Reflux

- immature lower oesophageal sphincter
- increased intra-gastric pressure, e.g.: pyloric stenosis
- associated anomalies, e.g.: hiatal hernia
- neurologically impaired children

Table 2. Clinical features

#### Infants

- vomiting
- failure to thrive
- repeated otitis media
- oesophagitis- crying, irritability, anemia
- stricture - dysphagia
- aspiration - recurrent infections, asthma
- apnoeic spells, sudden infant death syndrome (SIDS)

#### Children

- vomiting
- heartburn
- regurgitation
- haematemesis
- dysphagia
- aspiration
- Sandifer's Syndrome

### Investigations

- high index of suspicion
- barium swallow and meal
- 24-hour pH monitoring
- endoscopy and biopsy

### Treatment

#### Medical

- small frequent feeds
- thickened feeds: cornstarch, cereal, carobel
- position > 30° prop-up for 24 hours a day
- H<sub>2</sub> antagonists/ proton pump blockers

### *Surgical*

- fundoplication
- correction of associated anomalies

### **Complications of fundoplication**

- recurrence
- gas bloat
- inability to vomit
- dysphagia

### **PYLORIC STENOSIS**

- cause- unknown
- usually first born baby boy usually presenting at the 2nd to 8th week of life
- strong familial pattern

### **Clinical Features**

- vomiting - frequent, forceful, non-bilious with/without haematemesis. The child is keen to feed but unable to keep the feed down
- failure to thrive
- dehydration
- constipation
- seizures

### **Physical Examination**

- dehydrated
- a test feed can be given with the child in the mother's left arm and visible gastric peristalsis (left to right) observed for. The doctor's left hand then palpates beneath the liver feeling for a palpable olive sized pyloric tumour against the vertebra.

### **Investigation**

- investigation to confirm diagnosis usually unnecessary
  - abdominal ultrasound
  - barium meal
- pre-operative assessment is very important
  - metabolic alkalosis is the first abnormality
  - hypochloraemia < 100 mmol/l
  - hyponatraemia < 130 mmol/l
  - hypokalaemia < 3.5 mmol/l
  - hypocalcaemia < 2.0 mmol/l
  - jaundice
  - hypoglycemia
  - paradoxical aciduria - a late sign

### **Therapy**

- rehydration
  - low (rapid will cause cerebral oedema) except if perfusion is poor

- fluid
  - ½ saline + 10%D/W (+ 5-10 mmol KCL/kg/day) at 150 ml/kg/day + % dehydration
  - replace nasogastric losses with normal saline
  - *Do Not* give Hartmann's solution (the lactate will be converted to bicarbonate)
- insert a nasogastric tube – 4 hourly aspiration with free flow
- pyloromyotomy after the electrolytes have been corrected

## MALROTATION

A term which embraces a number of different types of abnormal rotation. Important because of the propensity for volvulus of the midgut around the superior mesenteric artery causing vascular compromise of most of the small bowel and colon.

### Types of Clinical Presentation

- *Acute Volvulus*
  - sudden onset of bilious/ non-bilious vomiting
  - abdominal distention with/without a mass
  - bleeding per rectum is a late sign
  - ill baby with distended tender abdomen
- *Chronic Volvulus*
  - caused by intermittent or partial volvulus and results in lymphatic and venous obstruction and enlargement of mesenteric lymph nodes
  - recurrent abdominal pain and vomiting that is usually bilious
  - malabsorption
- Internal Herniation
  - due to lack of fixation of the colon.
  - cause entrapment of bowel by the mesentery of caecum and colon
  - recurrent intermittent intestinal obstruction

### Investigations

- plain Abdominal X-ray
  - all the small bowel is to the right side
  - dilated stomach +/- duodenum with rest of abdomen being gasless
- Barium meal and follow through
  - duodeno-jejunal junction to the right of the spine
  - duodenal obstruction, often with spiral or corkscrew appearance of barium flow
  - presence of small bowel mainly on the right side

### Treatment

#### *Pre-operative Management*

- rapid rehydration with correction of electrolytes
- orogastric or nasogastric tube with 4 hourly aspiration and free flow
- antibiotics (+ inotropes) if septic

#### *Operative*

- reduction of volvulus +/- resection (aim to preserve maximum bowel) (consider 2nd look operation) with division of Ladd's bands

## BILIOUS VOMITING IN A BABY OR CHILD – PLEASE REFER EARLY

Causes of persistent vomiting: numerous: see Table 3

Table 3. Causes of persistent vomiting in children	
<p><b>Neonates</b></p> <p><i>General</i></p> <ul style="list-style-type: none"> <li>• sepsis</li> <li>- meningitis</li> <li>- hydrocephalus/ neurological disorder</li> <li>- urinary tract infection</li> <li>• motility disorder</li> <li>• poor feeding techniques</li> </ul> <p><i>Swallowing disorder - incoordinate</i></p> <p><i>Oesophageal</i></p> <ul style="list-style-type: none"> <li>• atresia</li> <li>• webs</li> </ul> <p><i>Stomach</i></p> <ul style="list-style-type: none"> <li>• gastro-oesophageal reflux</li> <li>• duodenal atresia/ stenosis</li> </ul> <p><i>Small intestines</i></p> <ul style="list-style-type: none"> <li>• malrotation</li> <li>• stenosis/ atresia</li> <li>• adhesions</li> <li>• meconium peritonitis/ ileus</li> <li>• enterocolitis</li> </ul> <p><i>Large intestine and rectum</i></p> <ul style="list-style-type: none"> <li>• stenosis/ atresia</li> <li>• Hirschprung's disease</li> <li>• anorectal malformation</li> </ul> <p><b>Older children</b></p> <p><i>General</i></p> <ul style="list-style-type: none"> <li>• sepsis</li> <li>• neurological disorder</li> <li>• tumours</li> <li>• metabolic disease</li> </ul> <p><i>Oesophageal stricture</i></p> <p><i>Stomach</i></p> <ul style="list-style-type: none"> <li>• gastro-oesophageal stricture/ reflux</li> <li>• peptic ulcer disease</li> <li>• pyloric stenosis</li> <li>• gastric volvulus</li> </ul>	<p><b>Infants</b></p> <p><i>General</i></p> <ul style="list-style-type: none"> <li>• sepsis</li> <li>- meningitis</li> <li>- hydrocephalus/ neurological disorder</li> <li>- urinary tract infection</li> <li>• tumours</li> <li>• metabolic disease</li> </ul> <p><i>Oesophageal stricture</i></p> <p><i>Stomach</i></p> <ul style="list-style-type: none"> <li>• gastro-oesophageal reflux</li> <li>• pyloric stenosis</li> </ul> <p><i>Small intestines</i></p> <ul style="list-style-type: none"> <li>• malrotation/ volvulus</li> <li>• adhesions</li> <li>• Meckel's diverticulum</li> </ul> <p><i>Appendix- rare</i></p> <p><i>Large intestines</i></p> <ul style="list-style-type: none"> <li>• intussusception</li> <li>• Hirschprung's disease</li> <li>• enterocolitis/gastroenteritis</li> </ul> <p><i>Small intestines</i></p> <ul style="list-style-type: none"> <li>• malrotation/ volvulus</li> <li>• adhesions</li> <li>• Meckel's diverticulum</li> <li>• foreign body</li> </ul> <p><i>Appendicitis/ peritonitis</i></p> <p><i>Large intestines</i></p> <ul style="list-style-type: none"> <li>• intussusception</li> <li>• worm infestation</li> <li>• constipation: habitual</li> </ul>