Neonatal Intestinal Obstruction

Prof. R.A. Brown
Exomphalos Major + chromosomal defect
‘Red Flags’

• Respiratory distress – rapid, laboured, cyanosis
• Excessive salivation
• Vomiting – green, persistent
• Abdominal distension / mass
• Failure to pass meconium in 1st 24hrs
• Convulsions / lethargy
• Jaundice with pale stools
Special Problems / Ethical dilemmas

• Multiple congenital anomalies
• Prematurity – at risk
• Delayed diagnosis & delayed surgery
• Jaundice
• Coagulation disorders – give vitamin K
• Metabolic – hypoglycaemia / hypocalcaemia
• Infection prone – reduced immunity ++HIV
• Hypothermia
• IV fluids – beware too much
• GIT decompression – NGT prox, bowel washout
• Nutrients
PLEASE DON'T LET MY BABY DIE

A FATHER yesterday begged the law to give his desperately-ill baby the chance to live.

Medical experts believe 11-months-old Charlotte Wyatt, pictured, should be allowed to die because she is in constant pain.

By Paul Harris and Charlotte Gil

for nearly an hour, the tiny girl had wrapped her hand tightly around his fingers.

It was the sign, he said, that his stricken daughter was capable of forming bond. Mr Wyatt, 32, told court it happened as the baby lay in hospital in a
VACTERL
vertebral, anorectal, cardiac, trachea-esophageal, renal, limb
Oesophageal Atresia and Tracheo-oesophageal fistula

Presentation and recognition

- Prevents normal swallowing
- Polyhydramnios in 33% with a distal fistula
  100% without fistula
- Often premature, IUGR
- Drooling and excessive oral secretions
- When suckling the baby appears to choke
  and may have difficulty maintaining airway
- Significant respiratory distress may result
- May have the seal-bark cough that indicates tracheomalacia
- Unable to insert tube more than 10-11 cm
  from the lips
Oesophageal atresia

Diagram showing different stages of oesophageal atresia:
- Stage a
- Stage b
- Stage c
- Stage d
- Stage e
- Stage f

Image of a baby with oesophageal atresia.

X-ray image of a baby showing a feeding tube.

Illustration of a baby with oesophageal atresia.
Tracheoscopy – type c (proximal atresia and distal TOF)
Oesophageal Atresia and Tracheo-oesophageal fistula

Basic concepts of surgery
- Thoracotomy
- Primary anastomosis
- Ventilate for 5 days if tension
- ICD to assess for leak

- If gap too long: gastrostomy, replogle on suction, ‘grow’ the child
- Then: Anastomosis or graft interposition

- Post op: Omeprazole, No feeds for 1 week, check contrast swallow day 7 to 10, slowly introduce feeds
Ramsted’s pyloromyotomy
Pyloric stenosis – visible peristalsis, forceful (projectile) milk vomits
Contrast meal

Stomach peanut shaped

Delayed emptying

‘tit’ sign

Beak

String sign

Umbrella/mushroom
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↑,↓ = outside ref. range

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Neonatal bowel obstruction
green vomit, abdominal distension & failure to pass meconium
Duodenal Atresia and Stenosis

Pathology

- Duodenal atresia - complete obliteration of the lumen
- Duodenal stenosis is incomplete obstruction of the duodenal lumen and may present at various ages - clinical findings depend on the degree of stenosis (pinhole to mild narrowing)
- Annular pancreas occurs when pancreatic tissue surrounds the 2nd portion of the duodenum, it may be associated with complete or incomplete duodenal obstruction
Duodenal Atresia

Presentation and Recognition

- Incidence is 1:3400 live births
- Incidence equal in males and female
- Growth retardation and polyhydramnios (in 40%)
- 50% are born prematurely
- Bile-stained vomit in neonates aged 24 hours or younger is typical. Minimal duodenal obstruction in mild stenosis or membrane may have few symptoms
- In a few cases, the atresia is proximal to the ampulla of Vater and the vomit is free of bile
Duodenal Atresia

Associated conditions

- Most commonly associated with trisomy 21 in 30%
- 50% of patients have some form of anomaly: cardiac, anorectal, genitourinary
- Oesophageal atresia and the VATER syndrome have been associated
- All neonates with duodenal atresia should be assessed for concomitant malformations
Duodenal Atresia

Radiology

- Double-bubble appearance with no distal gas
- Distal bowel gas indicates stenosis, incomplete membrane, or a hepatopancreatic ductal anomaly
- No oral contrast materials are necessary
- Use air if more definition required
Duodenal Atresia

Outcome

- Duodenoduodenostomy is performed when child is stable
- Average time to full feeds is 10 days
- Most do well and need no further procedures
Classification of types of intestinal atresia
Intestinal atresia – operative findings

Type 1

Type 3b or apple peel

Type 3a with antenatal volvulus
X-ray and contrast enema
jejunal atresia
Jejunal and Ileal Atresia

Outcome

- Most do well post op (90%)
- Short bowel syndrome occurs if there has been multiple atresias and the residual bowel length is 75cm or less
- Anastomotic strictures or breakdown is rare
- Exclude cystic fibrosis
Midgut volvulus

- **Acute Midgut Volvulus**
  - Clockwise twisting
  - Most under 1 month
  - Bilious vomiting
  - Colicky abdominal pain
  - PR bleeding
  - Hypovolemia
  - Shock
  - Tenderness & peritonitis

- **Chronic Midgut Volvulus**
  - Older age (2+)
  - Chronic vomiting
  - Intermittent pain
  - Diarrhoea
  - Hematemesis
  - Chyle ascitis
  - Malabsorption

Asymptomatic
Corrective surgery is indicated at any age
Midgut volvulus

3 yr. old with sudden onset of abdominal pain and vomiting. Past history of recurrent abdominal cramps.
Hirschsprung’s Disease

Functional obstruction of the intestine resulting from the congenital absence of parasympathetic ganglion cells in the myenteric plexus of the distal bowel.
Incidence 1:5000
M:F 4:1
2% premature (37 weeks)

Genetic and Microenvironmental factors

Familial predisposition (2.4%-9%)

Genes Implicated RET (10)
EDNRB (13)
Endothelin 3 (20)
Associated abnormalities

21% (11-30)

12% Chromosomal (Downs 6%, Waardenburg)
8% Git
6% CNS
6% UGS
6% CVS
Site of aganglionosis

70% rectosigmoid

10% total colonic
(familial 50%)

Internal Sphincter involved- abn relaxation
Diagnosis

History:
Delay of passage of mec  24h
Abd distension/bile stained vomiting
Hirschsprungs associated enterocolitis
Chronic constipation in older children
Radiology

**AXR**- Air fluid levels in dilated colon
Dilated small intestine

**Ba enema**- Dilated proximal colon
Funnel shaped narrowing
Narrow distal colon
Hirschsprung’s Disease

2 day old male with abdominal distension, green vomit & failure to pass meconium. Normal anus.

Contrast enema showing a patent colon but narrower rectum than sigmoid.

At operation a transition is clearly visible between the contracted aganglionic distal bowel & obstructed proximal sigmoid colon.
Histology

- Absence of ganglion cells in Auerbachs and Meissners plexus.
- Enlarged peripheral nerve trunks
- Increased acetyl cholinesterase on staining
Management

Relieve obstruction with definitive surgery

Initial
- Defunctioning colostomy in ganglionated bowel
- Temporary decompression with saline washouts

Final
- Resection of aganglionic segment
- Pullthrough of ganglionated bowel and anastomosis to anorectal canal
Complications

Early  -  Anastomotic problems
       -  Sepsis
       -  Stenosis

Late   -  Constipation (9%)
       -  Obstructive symptoms
       -  Enterocolitis
       -  Stricture
       -  Incontinence
Anorectal Malformations

Types, frequency, concept of level

• Clinical classification: the level of the rectum in relation to the puborectalis muscle
• High lesions don't pass through this muscle complex, more likely to elicit long-term continence problems. A rectourethral fistula usually present
Anorectal Malformations

- Low lesions traverse this muscle complex, have a better prognosis and are more likely to have perineal or posterior fourchette fistulas.
- Associated maldevelopment of the sacrum impairs innervation of both anal and urethral musculature leading to bladder and bowel dysfunction.
In patients after perineal fistulas and vestibular fistulas, it is probable the third most common defect is rectovaginal fistula, which is present following pelvic fracture. Rectovaginal fistulas are usually nonexceeding 1% of cases. Typically, most were repaired by direct eversion of the rectum and the fistula. Most fistulas were repaired with a posterior perineorrhaphy and the rectum was left in place. The rationale for this procedure is that most of the rectum and the fistula are resected, and the rectum is frequently called “rectovaginal fistula.” Rectovaginal fistulas in male patients are the usual real and direct supratelevator muscle malformation. Fortunately,

A
Anorectal Malformations - male

1. ‘high’ malformation – anorectal agenesis with recto-vesical fistula, sacral agenesis and poor pelvic floor muscles

2. ‘high’ or ‘intermediate’ anorectal agenesis with recto-urethral fistula

3. ‘low’ anomaly - covered anus with a ‘bucket handle’
Anorectal Malformations

Presentation and recognition

- Failure to pass meconium
- Patients with low lesions may be able to defecate via a vestibular anus or large fistula to perineum, but over time constipation and abdominal distension supervene
- Patients with anterior ectopic anus may present as children or adults with constipation
- Newborns with high lesions may have meconium at the urethral meatus or noted in the urine
Anorectal Malformations

- Diagnosis is confirmed by examination of the perineum
- Flat perineum, short sacrum suggests a high anomaly
- In males, meconium at the urethral meatus or in urine, or pneumaturia suggests a rectourethral or rectovesical fistula. In females, a fistula may open at the posterior vestibule
- A perineal fistula may be small and difficult to detect. Waiting 24 hours allows gas or meconium to appear at the perineum
- A single perineal opening in a female patient implies a cloaca.
Anorectal Malformations

Associated conditions and syndromes

- Occur in 50-60%, especially high anomalies – may be VACTERL
- Cardiovascular malformations occur in 12-22%
- Tracheoesophageal abnormalities exist in 10%
- Vertebral anomalies: Lumbosacral anomalies in approximately 1:3. The frequency of spinal dysraphism (the most common is tethered cord) increases with the severity of the lesion
- Urologic abnormalities: vesicoureteric reflux in 50% of patients, renal agenesis and dysplasia, Cryptorchidism occurs in up to 20% of males. Vaginal and uterine abnormalities are common
- Limb abnormalities – radial dysplasia

Lumbar agenesis  Reflux  Renal dysplasia  Tethered cord
Anorectal Malformations

Basic concepts of surgery

- A divided colostomy is performed for patients with high lesions until later definitive repair.
- Posterior sagittal correction (PSARP) has been performed as the gold standard at 3 to 6 months. Incision in the midline posterior sagittal plane identifies the muscle complex and terminal rectum. The fistula to the genitourinary tract is corrected. Electrical stimulation of the sphincters and levator muscle complex shows correct anal position.
- Cloacal anomalies involve advancing the urethra, vagina and rectum to the perineum. They may require a combined abdominal and perineal approach.
- Low lesions can undergo a limited posterior sagittal approach to transpose the anus to the sphincters.
- The latest approach is a laparoscopic assisted anorectal pullthrough.
Meconium Disease in infancy

- Meconium ileus without C.F.
- Meconium obstruction and the prem infant
- Meconium plug syndrome
- Hirschsprung’s Disease
- Small Left Colon Syndrome
- Meconium peritonitis
Meconium ileus in newborn

Inc. C.F. in USA 1:3000
15% mec ileus equals 180 pts/ year
Rare in non Caucasians
CF gene Chromosome 7 (1985)
Pathogenesis

Abnormalities of exocrine mucous secretion

- Obstruction of pancreatic duct/intestinal glands
- Low water content (65% vs. 75%) in mucus
- Low enzyme levels sucrase/lactase/pancreatic enz.

Sticky meconium, which obstructs lumen
Antenatal Perforation

• Aet: volvulus/ distension
• Inc: 50%
• Results in: bowel atresia, meconium peritonitis, meconium pseudocyst
Diagnosis

- Not antenatally
- Intestinal obstruction in the newborn
- Doughy abdominal mass
- Complications: erythema/oedema of anterior abdominal wall
Treatment

a) Non Surgical
 Hydrostatic enema decompression
 Aim to reflux into terminal ileum
 Repeated enema may be necessary
 60-75% success

b) Surgical
Uncomplicated
 Enterotomy
 Saline
Relieve obstruction
 Acetylcysteine

Complicated
 Resection
 Anastomosis covered by colostomy
 Drainage and bowel rest, delayed anast 3 weeks post op
- AXR inconsistent (diff loop size, meconium mottling, paucity rectal gas)
- Contrast enema (water soluble) small unused colon/terminal ileum
- Biochem Sweat test
- Genetic testing
INGUINAL HERNIA
AETIOLOGY

Persistence of processus vaginalis

(peritoneal tongue accompanying descending testis or round ligament)

M:F 8:1
Figure 2. Processus obliterated: normal situation after birth.
Figure 3. True hernia.
OPERATE FOR COMPLICATIONS

Irreducibility
Obstruction
Strangulation

60% < 6 months
80% < 1 year

Operate at diagnosis
GO TO SLEEP
Your in good hands