

Acute intestinal obstruction

Surgical management

Dr Dinesh Veerapaneni

- The initial management of any patient with an intestinal obstruction is correction of the fluid and electrolyte deficit by intravenous fluids, combined, if possible, with deflation of the bowel
- A nasogastric tube is passed and the contents of the distended stomach are aspirated
- Initial fluid and electrolyte resuscitation prior to surgery is important. General anesthesia must be combined with protection of the airway from inhalation of vomit

Indicators for early surgical intervention

- Obstructed/strangulated external hernias
- Internal intestinal strangulation
- Acute obstruction

Indicators for early surgical intervention

- Prompt operative intervention is mandatory in patients who develop sign and symptoms suggestive of strangulation obstruction
- These parameters include
 - Fever
 - Tachycardia
 - Leukocytosis
 - Localized tenderness
 - Continuous abdominal pain
 - peritonitis

Indicators for early surgical intervention

- Patients who develop free air , signs of a closed-loop obstruction on abdominal radiograph, or gross peritonitis require emergent operative exploration
- If CT demonstrates evidence of ischemia, such as pneumatosis intestinalis, bowel wall thickening, portal venous gas, generalized ascitis, or non enhancement of bowel wall, operative intervention should be considered strongly

Indicators for early surgical intervention

- Operative intervention may also be considered in patients who doesn't improve within 48 hours of conservative treatment
- The non operative management always carries a calculated risk of overlooking an underlying strangulation obstruction

Surgery

- If the site of obstruction is not known, adequate exposure is best achieved by a midline incision
- In case of previous scar incision taken on the scar
- In pediatric surgeries a generous transverse muscle cutting incision taken just above umbilicus. The falciform ligament, containing the umbilical vein, must be securely ligated, as vessel is still patent

Principles of surgical intervention for obstruction

- The management of
 - Segment at the site of obstruction
 - The distended proximal bowel
 - The underlying cause of obstruction

- Identification & assessment of caecum is the best initial manoeuvre
 - If it is collapsed, lesion is in the small bowel and identified by retrograde assessment
 - If dilated, it indicates large bowel obstruction
- To display the cause of obstruction, distended loops of small bowel should be displaced with care & covered with warm moist abdominal packs

- Operative decompression may be required
 - If dilatation of bowel loops prevents exposure
 - The viability of bowel wall compromised
 - Subsequent closure will be compromised
- It is performed
 - using Savages decompressor within a seromuscular purse-string suture

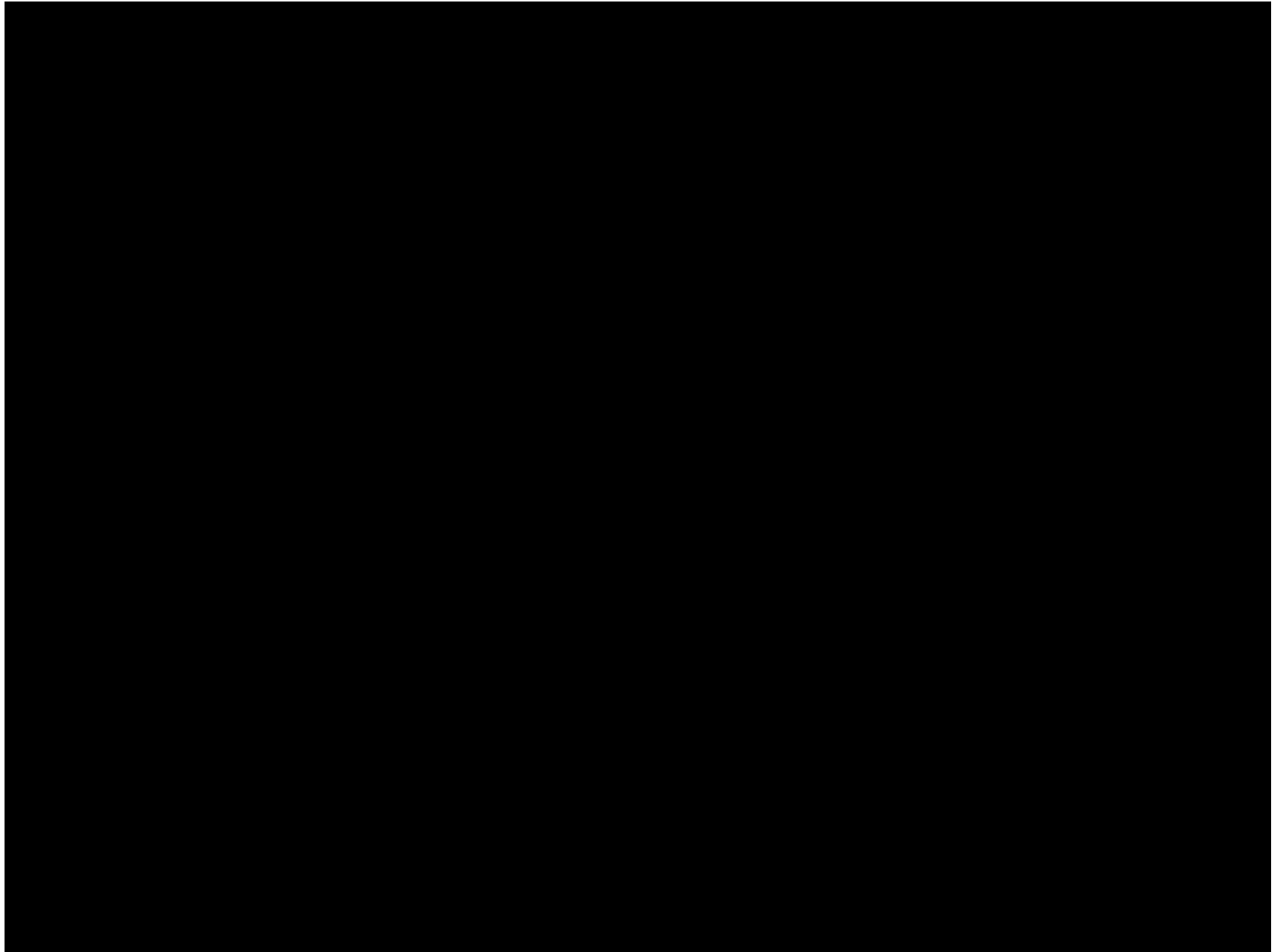
or

 - large naso-gastric tube in place, the small bowel contents may be gently milked in a retrograde manner to the stomach for aspiration

- The type of surgical procedure required will depend upon cause of obstruction
 - If adhesion – Adhesiolysis
 - Excision
 - Bypass
 - Proximal decompression

Adhesiolysis

- Although multiple adhesions may be found only one may be causative
- This should be divided and the remaining adhesions left in-situ unless severe angulation is present as division of these adhesions will only cause further adhesion formation
- When obstruction is caused by an area of multiple adhesions, the adhesions should be freed by sharp dissection



Adhesiolysis

- To prevent recurrence, the bare area should be covered with omental grafts
- After the release of band obstruction, the constriction site that have suffered direct compression should be carefully assessed for viability

Adhesiolysis

- Indication of non-viability
 1. absent peristalsis
 2. loss of normal shine
 3. loss of pulsation in mesentery
 4. green or black color of bowel
- If doubtful viability they should be infolded by use of a seromuscular suture and covered with omentum
- The non viable part is then resected and anastomosis done

Adhesiolysis

- In doubtful cases, following resection, both ends of the bowel should be raised as stomas
- This allows the regular assessment of the bowel
- When no resection has been undertaken or there are multiple ischemic areas(mesenteric vascular obstruction), a second look laprotomy at 24-48 hours may be required

Anastomosis

- Anastomosis may be
 - i. End-to-end
 - ii. End-to-side
 - iii. Side-to-end
 - iv. Side-to-side
- The choice of anastomosis depends upon the operative anatomy and surgeon preference

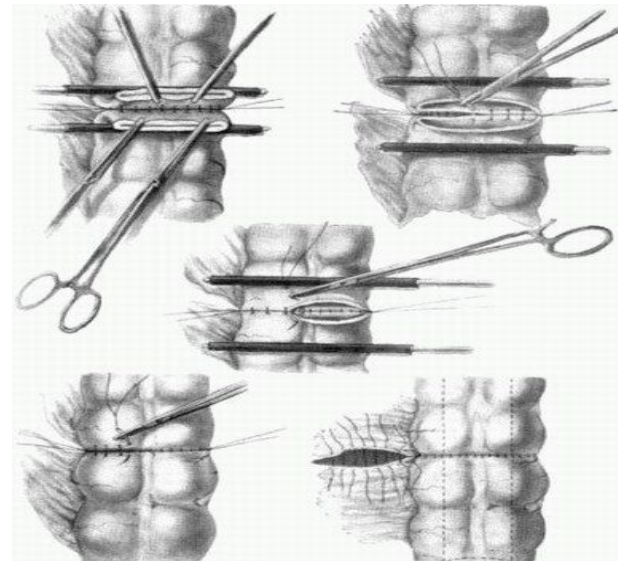
Anastomosis

- Accurate approximation of two well-vascularized healthy limbs of bowel without tension in a normotensive, well nourished patient may almost always result in good outcome
- Risk factors for leak/stricture are
 - Those that are in the distal rectal or anal canal
 - Involve irradiated/diseased intestine
 - Performed in malnourished, ill patient

Anastomosis

End-to-end

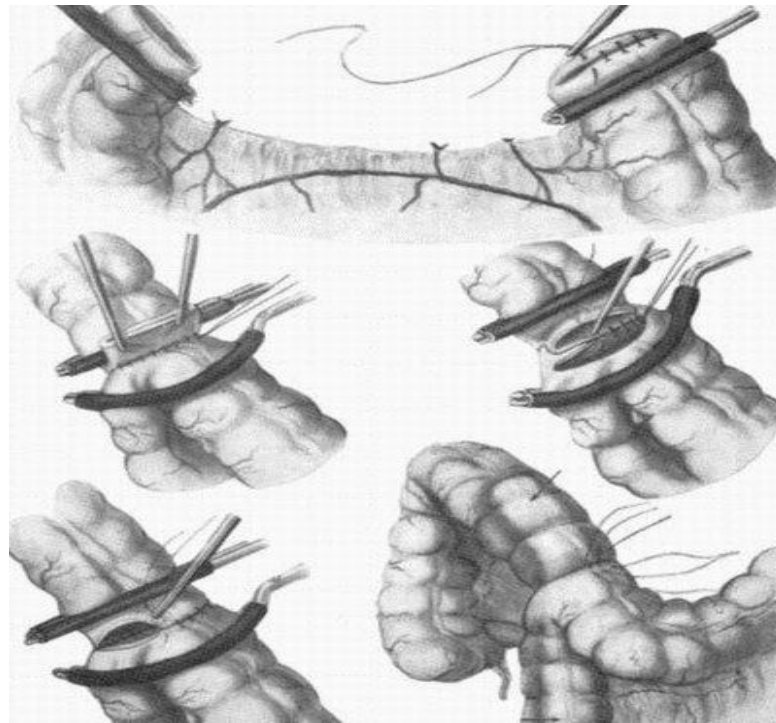
- It can be performed when two segments of bowel are roughly the same caliber
- Ex- rectal resections, colocolostomy, small bowel anastomosis



- End-to-side

It is used when one limb of bowel is larger than the other

This most commonly occurs in the setting of chronic obstruction



Anastomosis

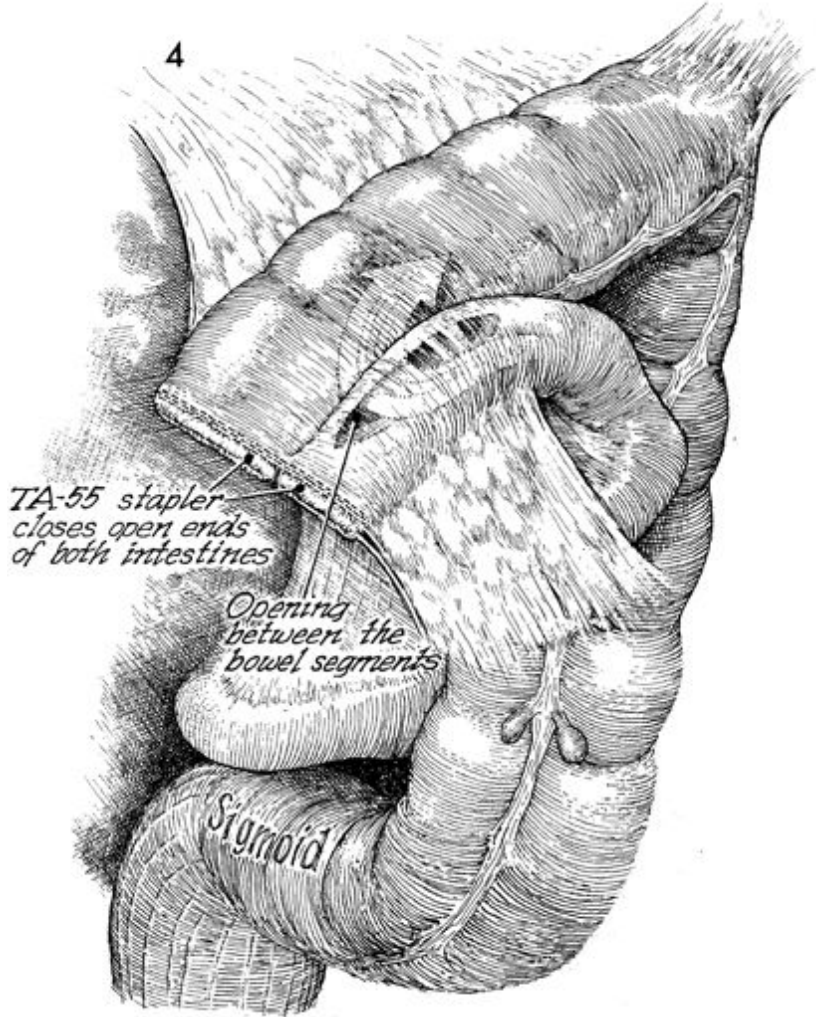
Side-to-end

- It is used when the proximal bowel is of smaller caliber than the distal bowel
- Ex- ileo-rectal anastomoses
- This may have less tenuous blood supply than an end-to-end anastomoses

Side-to-side

- It allows a large, well vascularised connection to be created on the antimesenteric side of two segments of intestine
- Ex- ileocolic & small bowel obstruction

Side-to-side



Anastomosis

Anastomotic technique-

1. Hand sutured technique-

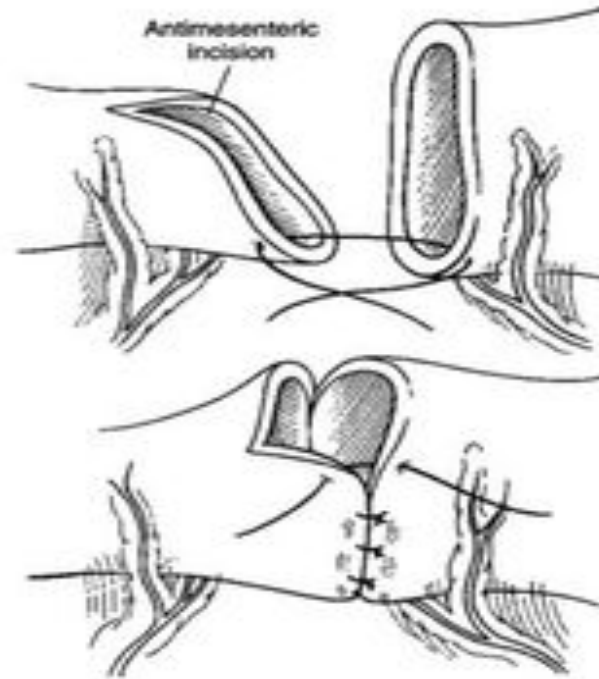
– It may be single layer using either interrupted stitches

Or

– Double layer consisting of a continuous inner layer and an interrupted outer layer

• Suture material may be either permanent or absorbable

Hand sutured technique

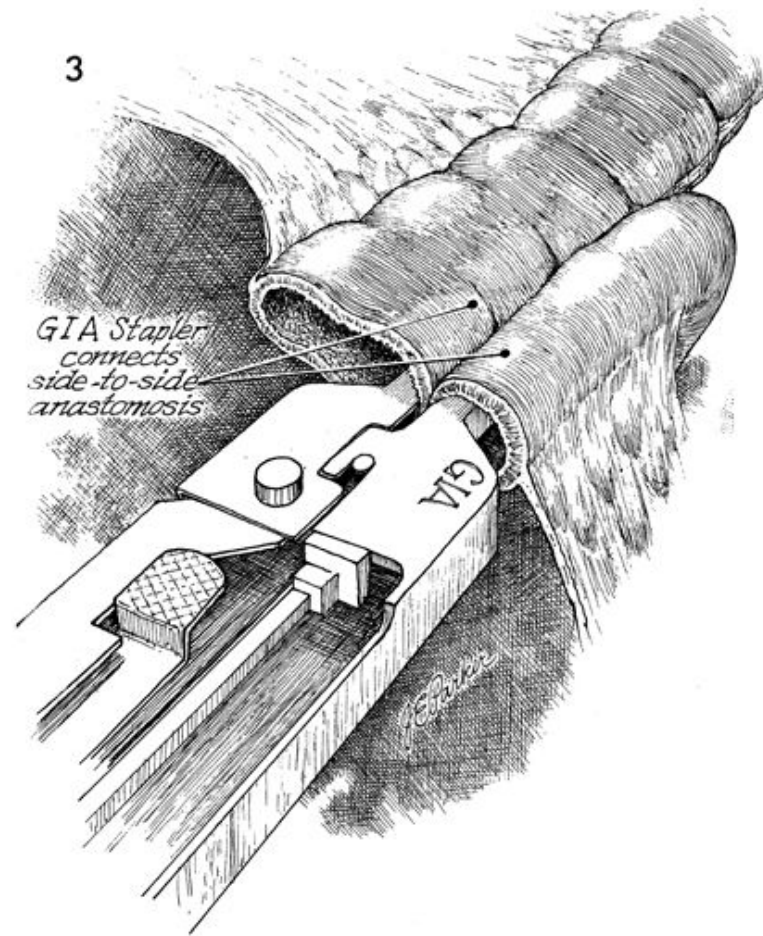


Anastomosis

2. Stapled technique-

- Linear cutter stapling devices are used to divide the bowel and to create side-to-side anastomoses
- It may then be reinforced with interrupted sutures if desired
- Circular stapling devices can create end-to-end or side-to-end anastomoses

Stapled technique



Ostomes

- It may be temporary or permanent
- It may be end-on or a loop
- A stoma should be located within the rectus muscle to minimize the risk of a post operative parastomal hernia
- It should be placed where the patient can see it for easier use of the appliance
- The surrounding abdominal soft tissue should be as flat as possible to ensure a tight seal and prevent leakage

Ostomes

Procedure-

- A circular skin incision is created and the sub-cutaneous tissue dissected to the level of the anterior rectus sheath
- It is then incised in a crutiate fashion , the muscle fibers separated bluntly and the posterior sheath identified and incised
- The bowel is then brought through the defect and secured

Ostomes

- In order to make the appliance use easier, a protruding nipple is fashioned by everting the bowel
- Three or four interrupted absorbable sutures are placed through the edge of the bowel, then through the serosa approximately 2cm proximal to the edge, and then through the dermis (Brook technique)

Ostomes

Ileostomy-

- Temporary ileostomy-
 - It is used to protect an anastomoses that is at risk of leakage
 - In this, the stoma is often constructed as a loop ileostomy
- Permanent ileostomy-
 - A permanent ileostomy is sometimes required after total proctocolectomy or in patients with obstruction
 - An end ileostomy is the preferred configuration because a symmetric protruding nipple can be fashioned more easily than with a loop ileostomy

Ostomes

Complications of ileostomy-

- Stoma necrosis may occur in the early post operative period
- Limited mucosal necrosis above the fascia may be treated expectantly, but necrosis below the fascia requires surgical revision
- Stoma retraction may occur early or late, and may be exacerbated by obesity, local revision may be necessary
- Skin irritation can also occur
- Obstruction may occur intra abdominally or at the site where stoma exits the fascia

Ostomes

Cholostomy-

- Most colostomies are created as an end colostomy rather than loop colostomy
- The bulkiness of the colon makes loop colostomy awkward for an appliance and prolapse is more likely with this configuration
- Most are created on the left side of colon
- Closure of colostomy requires laprotomy
- The stoma is dissected free of the abdominal wall and the distal bowel identified
- An end-to-end anastomoses is then created

Acute Large bowel Obstruction

- The abdomen should be opened through midline incision
- Distention of the caecum will confirm large bowel involvement
- Identification of a collapsed distal segment of the large bowel and its sequential proximal assessment will readily lead to identification of the cause
- When a removable lesion is found – an emergency right hemicolectomy should be considered
- If the lesion is irremovable, a proximal stoma or ileotransverse bypass should be considered

Acute Large bowel Obstruction

- Obstructing lesion at the splenic flexure should be treated by an extended right hemicolectomy with ileodescending colonic anastomoses
- For obstructing lesions of the left colon or rectosigmoid junction, immediate resection should be considered unless there are clear contraindications like
 - Inexperienced surgeon
 - Moribund patient
 - Advanced disease

Acute Large bowel Obstruction

- If an anastomoses is to be considered using the proximal colon, in the presence of obstruction, it must be decompressed and cleaned by an on-table colonic lavage
- The subsequent anastomoses should still be protected with a covering stoma

Treatment for Caecal Volvulus

- The volvulus should be reduced
- Sometimes, this can be achieved after decompression of the caecum using a needle
- Further management consists of fixation of the caecum to the right iliac fossae and/or a caecostomy
- If the caecum is ischemic/gangrenous, a right hemicolectomy should be performed

Treatment for Sigmoid Volvulus

- Early laprotomy, with untwisting of the loop and per anum decompression
- When the bowel is viable, fixation of the sigmoid colon to the posterior abdominal wall may be a safer maneuver
- Resection is preferable if it can be achieved safely

Treatment for intussusception

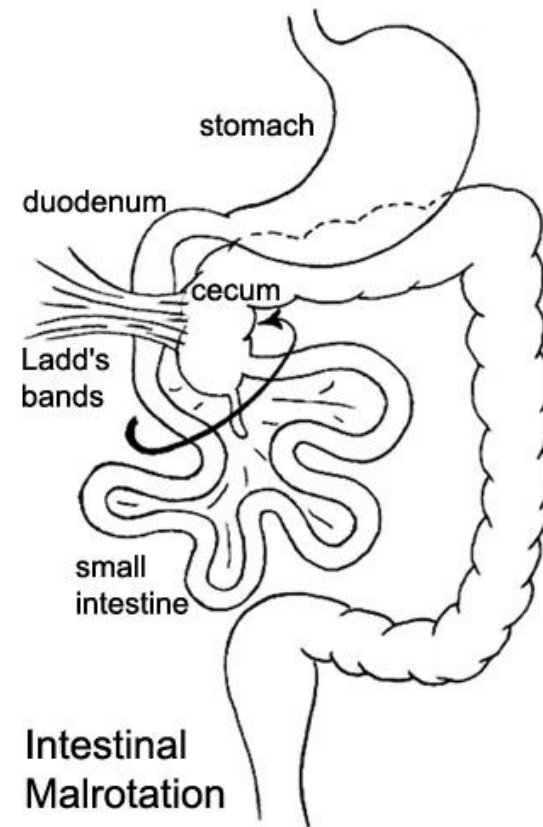
- Surgery is required when radiological reduction has failed or is contraindicated
- After resuscitation, a transverse right sided abdominal incision provides good access
- Reduction is achieved by gently compressing the most distal part of the intussusception towards its origin
- After reduction, the terminal part of the small bowel and the appendix will be seen to be bruised and edematous
- The viability of the whole bowel should be checked carefully
- An irreducible intussusception or one complicated by infarction or a pathological lead point requires resection and primary anastomoses

Treatment for intestinal atresia

- Laprotomy is performed through a transverse muscle cutting incision in the right upper quadrant and the diagnosis confirmed
- Duodenal atresia is corrected by a duodenoduodenostomy
- In most cases of jejunal /ileal atresia, the distal end of the dilated proximal small bowel is resected and a primary end-to-end anastomosis is possible
- If the proximal bowel is extremely dilated it may need to be tapered to the distal bowel before anastomoses
- Occasionally, a temporary stoma is required before definitive repair

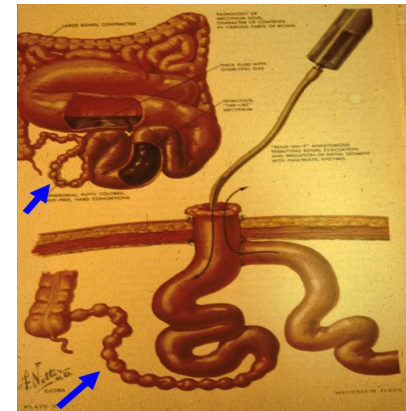
Treatment of Malrotation & neonatal volvulus

- The volvulus is reduced, the transduodenal band(Ladd's band) divided, the duodenum mobilized & the mesentery freed.
- Appendicectomy is routinely performed to avoid diagnostic difficulty with appendicitis in the future.
- Infarcted bowel necessitates resection.



Treatment for Meconium Ileus

- Colonic washouts may restore patency
- Proximal ileum is anastomosed end to side to the colon with a distal ileostomy to clear the obstruction.



A drawing by Netter depicting meconium ileus. Note the dried out "pebbles" of meconium (stool) which are blocking the intestines (arrows). Sometimes an ileostomy must be performed.

Thank you