Failure To Pass Meconium In Neonates

Dr Hasan Nugud
Consultant
Paediatric Surgeon
Failure to Pass meconium in the neonate

- Timely passage of the first stool is a hallmark of the well-being of the newborn infant,
- Failure of a full-term newborn to pass meconium in the first 24 hrs may signal intestinal obstruction.
Clinical presentation of meconium retention :-

- Failure to pass meconium combined with,
- Progressive abdominal distension,
- Refusal to feed,
- Vomiting of bilious intestinal contents.
Clinical presentation of meconium retention :

- **Abdominal Examination** → Distended loops of bowel (visible or palpable),
- **Anal Inspection** → Is essential to exclude the presence of anal atresia, perineal or anovestibular fistula, membranous forms of anal atresia and anal stenosis.
Clinical presentation of meconium retention :-

- Plain Abdominal X-Ray → Dilated intestinal bowel loops,
- Will not allow differentiation of small bowel obstruction from large bowel obstruction.
Clinical presentation of meconium retention:

Plain abdominal x-ray showing bowel distention due to meconium retention. Note the difficulty in differentiating small bowel from large bowel of the distended bowel loops.
Clinical presentation of meconium retention:

- Different appearances of abdominal distension resulting from meconium retention.
Clinical presentation of meconium retention:

Severe abdominal Distension
Differential Diagnosis of Small bowel obstruction in neonates

- Duodenal atresia,
- Malrotation & Volvulus,
- Jujunal Atresia,
- Ileal Atresia,
- Meconium Ileus,
- Meconium peritonitis.
Differential Diagnosis of Large Bowel Obstruction

- Hirschsprung’s Disease,
- Meconium Plug Syndrome,
- Left Colon Syndrome,
- Anorectal Malformations
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

- 1:400 live births,
- 20-25% of cases of neonatal bowel obstruction,
- Affects 4X as many boys,
- The abnormal bowel enervation affects the internal sphincter and most often the rectosigmoid is involved.
Hirschsprung’s Disease (HD)  
(Congenital Aganglionosis)

- The mean age at diagnosis has decreased to 2.6 months because of vigilance on the physicians, the use of anorectal manometry for assessment of anal sphincteric function, & early rectal biopsy to confirm the clinical diagnosis.
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

- Common Presentation in Newborns:
  - Failure to pass meconium during the first few days of life, or subsequent passage of a meconium plug followed by large bowel movements,
  - G.I. bleeding & diarrhea \(\rightarrow\) are dangerous signs of HD associated enterocolitis.
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

Note the narrow aganglionic and dilated normal bowel segments on plain and contrast study films.
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

Long segment Hirschsprung’s Disease
Hirschsprung’s Disease (HD) 
(Congenital Aganglionosis)

- Clinically → anus and rectum to be narrow and empty of stool,
- Plain abdominal X-Ray → Gas and stool in the colon,
- Distension with stool or gas does not reach distally to the pelvic rim.
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

- **Barium Enema** → performed with the colon unprepared, may reveal a transitional zone that separates narrow aganglionic bowel from the normally ganglionated dilated bowel loops above.

- Presence of contrast in a 24 hrs film is also suggestive of HD.
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

1- Long segment HD (narrow part: unused aganglionic segment)
2- Total colon aganglionosis (the whole colon of narrow caliper unused)
Complete colonic aganglionosis
Hirschsprung’s disease
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

An infant with total colon aganglionosis Proximal ileostomy (one opening) with closed distal unused colon (Hartman’s pouch)
Hirschsprung’s Disease (HD)  
(Congenital Aganglionosis)

- The transitional zone may not be recognizable:
  - In up to 25% of neonates, in patients:
    1. With ultra short segment HD,
    2. In a patient with total colonic aganglionosis in whom the transitional zone is above the colon (in terminal ileum),
    3. In a patient who had an emergency colostomy.
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

1- Narrow aganglionic segment
2- Transitional zone
3- Normally ganglionated dilated part of the bowel
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

Typical Short segment Hirschsprung’s disease
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

Hypertrophied proximally ganglionated dilated large and small bowel in HD
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

- **Anorectal Manometry** → changes in anal pressure are recorded during and after rectal distension. When ganglion cells are present, rectal distension with a balloon, inhibits the internal anal sphincter causing fall in the anal pressure (called rectosphincteric reflex). In patients with HD rectosphincteric reflex is absent.
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

- Rectal Suction biopsy or, →
- Formal rectal biopsy →
- No ganglion cells,
- Increased acetylocholinesterase staining of increased coarse neural fibers within the muscularis mucosa and lamina propria.
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

- **Treatment** → Surgery to remove or bypass the diseased bowel,
- **Colostomy** is initially placed into the normal bowel for decompression, followed by corrective surgery in 3 or 4 months,
- Occasionally a primary pull-through procedure is performed.
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

Right transverse double barrel colostomy
Hirschsprung’s Disease (HD) (Congenital Aganglionosis)

Duhamel pull-through procedure
Transanal pullthrough

Postero Sagital Ano Recto Plasty (PSARP) without colostomy after proper bowel preparation and antibiotic. Prior to repair.
Disection upwards to the ganglionic region confirmed by intraoperative repeated biopsies ended by suturing ganglionic area to anal mucosa.

The resected length can be as long as 45 cm even up to the splenic flexure.

Trans anal pull through Postero Sagital Ano Recto Plasty (PSARP)

Dissection upwards to the ganglionic region confirmed by intraoperative repeated biopsies ended by suturing ganglionic area to anal mucosa.
Meconium Plug Syndrome

- A transient form of distal colonic or rectal obstruction caused by inspissated immobile meconium,
- 1:500 to 1:1000 neonates,
- Etiology is unclear.
Meconium Plug Syndrome

- Meconium plug obstructing the anorectal part of the large bowel causing delay in the passage of the meconium (HD should be excluded by rectal biopsy after thorough observation)
Meconium Plug Syndrome

- **Plain Abdominal X-Ray** → Generalized gaseous distension of intestinal loops of small and large bowel filling the entire abdomen, but often with no fluid levels.
- **Contrast enema** → Diagnostic, outlines the meconium plug and therapeutic if plug is passed afterward.
Meconium Plug Syndrome

1- Note the equally distended undistinguishable small and large bowel loops due to meconium retention,

2- Note the meconium plugs and pelets obstructing the distal large bowel.
Meconium Plug Syndrome

- In some newborns, rectal stimulation with a thermometer, digital rectal examination or a saline enema induces passage of the plug,
- After the plug is passed, bowel movements are normal and all symptoms resolve.
Meconium Ileus

- 30% of cases of intestinal obstruction in newborns are due to meconium ileus,
- In 50% of newborns with meconium ileus, the gut is undamaged, and continuity is not disrupted, the obstruction is merely due to intra-luminal meconium,
- In other infants, it is associated with volvulus, atresia or perforation,
- It occurs in 15% of patients with cystic fibrosis.
Meconium Ileus

- **Clinically** → Abdominal distension is present at birth within hours. As air is swallowed, the distension increases,
- Bile stained vomiting,
- Thickened bowel loops are often palpable and visible through abdominal wall,
- Massive distension, tenderness, erythema,
- **Anal stimulation** → empty or sticky meconium.
Meconium Ileus

- Please note the bluish discoloration due to meconium retention or meconium peritonitis
- Post motum showing the terminal ileum packed with sticky meconium
Meconium Ileus
Meconium Ileus

- **Abdominal X-Ray** → Distended bowels, few air fluid levels, and often in the right lower abdomen meconium mixed with air has a ground glass appearance,

- **Contrast enema** → Microcolon often with no bowel contents or small belets,

- Reflux of contrast if it occurs, reveals the plug with narrow bowel below the plug and dilated bowel above the plug.
Meconium Ileus

Microcolon filled with pellets and dilated bowels above the sticky meconium
Meconium Ileus

- **Treatment** → Can be treated by administration of gastrografin enema and I.V. fluids. If unsuccessful operative evacuation of the obstructing meconium by performing ileostomy and irrigation,

- **Complications** as atresia, perforation and meconium peritonitis → immediate resection and intestinal anastomosis or ileostomy.
Meconium Ileus

Meconium ileus with double barrel (Mikulicz) ileostomy
Meconium Ileus

- Other types of ileostomy used for the treatment of meconium ileus are:
  1. Bishop-koop ileostomy,
  2. Santuli ileostomy,
  3. Terminal ileostomy,
  4. Iop ileostomy.
Meconium Ileus

(a) - Mikulicz Double-barrel Enterostomy,
(b) - Proximal Chimney Santuli Enterostomy,
(c) - Distal chimney Bishop-Koop enterostomy
Meconium Ileus

Rehbein used a double tube technique, a wide-bore tube and a fine one, both introduced into the bowel proximal to the anastamosis, the former to drain the distended loop and the latter to irrigate the distal bowel. Bishop-Koop is the most satisfactory, effective w/o the disadvantage of excessive loss when the bowel begins to function.
Meconium Ileus

- **Roux-en-Y ileostomy** :-
  - After non-operative relief of obstruction of meconium ileus by gastrografin enema, The Bishop-koop Roux-en-Y enterostomy avoids excessive surgical handling, washouts after 24-36 hrs (warm saline or acetyl cysteine or gastrografin via the stoma).
Small Left Colon Syndrome

- A sign of an unused distal colon,
- Most often seen in infants of diabetic mothers who present with colonic inertia simulating Hirschsprung’s disease,
- Garstografin enema to stimulate peristalsis and encourage the passage of meconium.
Small Left Colon Syndrome

1- Left narrow unused colon up to splenic flexure and
2- Dilated transverse colon.
Picture similar to long segment HD,
Small Left Colon Syndrome

**Contrast enema:**
Note narrow left colon and dilated transverse colon & small bowel
Small Left Colon Syndrome

**Treatment:**
- Suction or formal rectal biopsy reveals normal ganglion cells and excludes HD,
- Frequent anal stimulations followed by passage of small amounts of meconium,
- Frequent washouts for several days,
- Transverse loop colostomy followed by closure in 3 month time.
Anorectal Malformations

- 1:4000 – 1:8000 neonates
- Is a result of failure of completion of the complex embryologic developmental sequences in which the growth of the urorectal septum, lateral mesodermal structures & ectodermal structures form the normal rectum & lower urinary tract.
Anorectal Malformations

- **Anal stenosis**
- 20% of the anorectal malformations,
- Anus is small and tight,
- Intense efforts are required to pass a ribbon-like stool,
- **Treatment** → anal dilatation.
Anorectal Malformations

- **Anal Atresia** →

- Characterized as high or low depending on whether the rectum ends above levator ani muscle or partially descends through this muscle,

- Often rectum ends in a fistula.

- In high type anal atresia, fistula often ends in the prostatic urethra or vagina.
Anorectal Malformations

- **Anal Atresia** → (cont. . .)
- Patients with a low type of anal atresia usually have a well defined sacrum, a prominent midline buttocks groove, and a prominent anal dimple,
- The low lesions are associated with a cutaneous fistula.
Anorectal Malformations

Imperforate anus with pyloric atresia

High imperforate anus
Low imperfodate abus
Low imperforate anus repair
Low imperforate anus repair
Anorectal Malformations

Low imperforate anus
Anorectal Malformations

Low cutaneous fistula  High imperforate anus
Low imperforate anus
With a perineal fistula
Low imperforate anus in a male with perineal fistula
Anorectal Malformations

- **Anal Atresia** $\Rightarrow$ (cont....)
- The orifice is small, located in the perineum, anterior to the center of external anal sphincter, close to the scrotum or vulva,
- Males frequently have a black ribbon-type structure in the perineum, which represents a sub epithelial fistula filled with meconium.
Anorectal Malformations

- **Anal Atresia** → Treatment →
  - Surgical correction is required,
  - A colostomy is initially performed with high anal atresia,
  - Low lesions can be corrected electively when the infant's condition is stable.
Anorectal Malformations

- **Anal Atresia** → Treatment → (cont…)
- If a fistula is present at the perineum (ectopic or anterior anus), or vagina (vestibular anus), can be dilated to allow passage of gas and meconium and correction can be done electively when the newborn’s condition is stable.
Anorectal Malformations

Note the passage of meconium
From: Ectopic or Vestibular anus
Anorectal Malformations

- Passage of meconium through the urethra, indicates the presence of either high (rectovesical) or low (rectourethral) fistula.
Anorectal Malformations

- Typical wide recto-vestibular anus (3 openings in the vulva) urethra (1), vagina (2) and vestibular anus (3) with sphincteric dimple at the anal position
Anorectal Malformations

Case 1- low imperforate anus (covered anus) packet handle
Anorectal Malformations

Case 2- low imperforate anus
Anocutaneous fistula
Anorectal Malformations

Case 2
Cut-back repair

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Other Causes

- Maternal Drug Use
- Illicit drugs,
- Magnesium Sulphate,
- Ganglionic Blocking Agents
- Neonatal Medical condition
- Hypothyroidism,
- Hypercalcemia, Hypokalemia,
- Sepsis
Other Causes

- Hypoganglionosis
- Neuronal Intestinal Dysplasia Type A
- Hypoplasia or aplasia of sympathetic enervation of the mesenteric plexus and mucosa with mucosal inflammation
- Neuronal Intestinal Dysplasia type B
- Dysplastic submucosal plexus and numerous giant ganglia with many giant & small ganglion cells.
Other Causes

- Megacystitis- Microcolon Intestinal Hypoperistalsis Syndrome

- Abundance of the ganglion cells in the gastrointestinal tract (GIT).