Neonatal Gastrointestinal Bleeding

Dr. Hasan Nugud
Consultant
Paediatric Surgeon
Introduction

- GI haemorrhage is an alarming situation for both the parent and the Surgeon.
- Fortunately, GI bleeding in most neonates is due to benign causes and is usually self-limited.
- Nevertheless, an aggressive diagnostic approach to the patient with significant bleeding is warranted.
GI Bleeding

Upper G.I. Bleeding

- Upper GI haemorrhage is defined as bleeding that originates proximal to the ligament of Treitz. This is manifested by either haematemesis, melena or occult blood loss, while lower GI haemorrhage may be present with haematochezia, melena or occult blood loss.
The initial diagnostic maneuver is to place a nasogastric tube.

The absence of blood in the presence of aspirated bile rules out an upper GI source with reasonable certainty, if blood is detected, the nasogastric tube allows drainage of the stomach to assess the rate of bleeding.

It also removes blood that would impair endoscopic evaluation.
Upper G.I Bleeding

- An initial impression can be formed from observation of the volume of blood from the nasogastric tube or amount of melenic stool.

- The most important information comes from the physiologic status of the patient.

- Usually blood loss of less than 10% of blood volume (8ml/kg) extremely well tolerated and may demonstrate only minimal elevation of pulse rate.
Upper G.I. Bleeding

- Increasing heart rate and hypotension suggest 10% - 20% loss.

- Hypotension and poor capillary refill are associated with blood loss in excess of 30% of blood volume.

- In general patients with greater than 10% blood loss should be monitored in an intensive care unit.
Approach for management of Neonate GI bleeding

- History & Examination
  - Whose blood is this?
    - Patient or mother
    - The blood should be tested chemically by apt test.
### History & Examination (contd..)

<table>
<thead>
<tr>
<th>Blood stained Stool &amp; water</th>
<th>Add 1ml of 1% sodium hydroxide</th>
<th>Maternal Blood</th>
</tr>
</thead>
</table>

- If the colour changes from pink to yellow-brown (over 2 minutes) this indicates *maternal blood*.
- If the baby is well and the history is compatible with swallowed blood then the baby may be discharged.
**History & Examination (contd..)**

<table>
<thead>
<tr>
<th>Blood stained Stool &amp; water</th>
<th>Add 1ml of 1% sodium hydroxide</th>
<th>Fetal blood</th>
</tr>
</thead>
</table>

- If the colour remains pink or is inconclusive this indicates *fetal blood*
- The baby must be admitted
- Further initial tests include: FBC, Coagulation profile, AXR
**GI Bleeding**

**History & Examination (contd..)**

- **Time of Ingestion of blood?**
  - Antepartum
  - Intrapartum
  - Postpartum

- **Character of blood?**
  - Haematemesis
  - Coffee-ground
  - Melena
  - Bright red blood
  - Red current jelly stool
  - Acute bloody diarrhoea
  - Even melena

**Upper**

**Lower**
History & Examination (contd..)

• Volume of blood?
  – Large volumes
    • Meckel’s diverticulum
    • Intestinal duplication
  – Small volumes or occult blood
    • Hirschsprung’s
    • associated enterocolites
History & Examination (contd..)

• Gestational age?
  – Premature → NEC
  – Full term → Hirschsprung’s disease

• Condition at labour,
  – Stressful labour and septic baby
    → stress gastritis + peptic ulcer
History & Examination (contd..)

• Antenatal diagnosis
  – Volvulus neonatorum
GI Bleeding

History & Examination (contd..)

- Onset of bleeding
  - Sudden
    - Meckel’s diverticulum
  - Gradual
    - Pyloric stenosis
    - Hirschsprung’s disease
**GI Bleeding**

**History & Examination (contd..)**

- Associated Symptoms
- Irritability, Crying, Vomiting &
- Abdominal distension
- Intussusception
• **Associated symptoms**
  - Bilious vomiting, abdominal distension
  →
  **Volvulus neonatorum**
Physical signs

- Cutaneous and gastro-intestinal vascular malformations → infantile haemorrhagic angiodyplasia.
GI Bleeding

History & Examination (contd..)

Physical signs (contd..)

- Palpable spleen & liver $\rightarrow$ portal hypertension.
- Bruises and petechiae → coagulation disorder.
GI Bleeding

History & Examination (contd..)

- Visual inspection of the anus may reveal an anal fissure
- History of epidemic of infectious diseases like dengue fever $\rightarrow$ dengue shock syndrome
- Drug history like Tolazoline, Indomethacin & maternal medication which cross placenta
History & Examination (contd..)

- Lab Tests
  - Apt test
  - FBC, WBC, Platelet count
  - PT, PTT, Bleeding time and coagulation profile
  - Blood gases
GI Bleeding

Radiological Examination

1. Plain Abdominal X-ray
GI Bleeding

Radiological evaluation (contd..)

2. Upper contrast study
GI Bleeding

Radiological evaluation (contd..)

3. Lower contrast study

Dolichosigma
Most of large bowel
On the left side
? Malrotation
4. Umbilical Fistulogram

Persistant ompalomesenteric duct
GI Bleeding

Radiological evaluation (contd..)

5. USS
Intussusception
GI Bleeding

Radiological evaluation (contd..)

5. Meckel’s isotope scan
6. Angiography
   - Celiac or mesenteric
   - Umbilical artery angiography.
GI Bleeding

Endoscopic examination

1. Upper endoscopy
2. Lower colonoscopy
3. Total GI endoscopy
4. Wireless capsule endoscopy
Approximately 1% of healthy full term newborns have symptoms of upper GI haemorrhage. Endoscopic examination reveals:

- Esophagitis in 45%
- Gastric erosion in 40%
- Gastric ulcers in 33%
- Gastric petechiae in 10%
- Duodenal ulcers in 2%
Vit K

- All newborns with bleeding must be considered to have Vitamin K deficiency and 1 mg of Vitamin K should be administered intramuscularly.
- If no underlying coagulopathy exists, nearly all newborns cease symptomatic bleeding in 48 hours.
- If symptom persist post 48 hours, endoscopy should be performed.
Treatment

1. Conservative treatment
2. Endoscopic treatment
3. Angiography with embolization
4. Surgical intervention
Upper GI Bleeding

1. Peptic Ulcer
2. Gastritis + Esophagitis
3. Swallowed Maternal Blood
4. Other Rare Conditions:
   a. Gastric NEC
   b. Portal hypertension
   c. Vascular malformation
Peptic Ulcers

- Peptic ulcer disease is caused by the combined action of acid and pepsin on gastro-intestinal mucosa.
- Ulcers in infants aged 1 to 15 days of age characteristically presented acutely with haemorrhage or perforation without pre-monitoring signs or symptoms.
- The ulcers in these neonate located usually in the duodenum and pylorus without bacterial invasion.
Peptic Ulcers

- Since 1963 little has been changed in the classification of peptic ulcers:
  - Primary ulcers: were defined as those in which the ulcer was the principle clinical and pathological entity.
  - Secondary ulcers were defined as those caused by severe stress or critical illness.
- In 1984, some reported bacteriological cause for some primary ulcers.
Primary Ulcers

- More common in boys than girls
- Associated with high levels of hydrochloric acid secretion
- More common in patients with blood group type O
- Strong family history in 35% – 50 %
- Higher in monozygous twins than in dizygous twins.
- More common with cortiosteroids.
Secondary Ulcers

• Also called stress ulcers.
• Associated with major physical or thermal trauma, sepsis or shock.
• Usually multiple superficial mucosal erosions.
• Located in the fundus of the stomach.
• Accounts for 80% of the peptic ulcer disease in infancy
Diagnosis

- Diagnosis made by:
  1. Clinical suspicion
  2. Endoscopic examination
  3. Radiological studies
  4. Angiography
  5. Explorative laparotomy
GI Bleeding

Treatment

1. NG tube insertion
2. Fluid resuscitation
3. Transfer to SCBU
4. Cross match blood and blood transfusion
5. Start medication
   a. Antacid
   b. H2 receptor antagonists
   c. Proton pump inhibitors
   d. Cyto protective medication.
Surgical Treatment

In primary peptic ulcers surgical treatment is by simple suture ligation of the ulcer bed. No evidence suggests that these ulcers recur.

In cases of secondary peptic ulcer with bleeding the surgical treatment may be more aggressive ending with partial or total gastrectomy.
GI Bleeding

Lower GI Bleeding

- Anal fissure
- Necrotising enterocolitis
- Malrotation with volvulus

Rare Causes:
1. Intussusception
2. Meckel’s diverticulum
3. Intestinal duplication
4. AV malformation
5. Angiodysplasia
GI Bleeding

Lower GI Bleeding

Anal Fissure

- Fissures usually produce bright-red blood that streaks in the stool or occurs in small spots on the diaper.
- Simple anal examination, sometimes performed with a nasal speculum, confirms the presence of an anal fissure, which is the most common lesion producing GI bleeding in infants.
- So further tests are unnecessary and successful treatment in almost all cases includes stool softness and rectal dilatation.
GI Bleeding

Anal fissure
• Necrotising enterocolitis in most neonates is suggested by the history.
• Radiography confirms the diagnosis so that aggressive medical resuscitation and therapy can be instituted.
• Eighty percent of these patients recover with supportive treatment including antibiotics, bowel rest and total parenteral nutrition.
NEC (contd..)

- The rest require laparotomy, drainage, resection, or decompression.
- Recurrent bleeding after apparent recovery can herald a second occurrence of the disease or post NEC stricture.
Malrotation with Volvulus

- The sudden onset of melena with bilious vomiting in an apparently healthy baby who often does not have abdominal distension suggests malrotation and midgut volvulus.
- The early physical examination generally yields negative results, although the abdomen progressively distends and tenderness ensues.
Malrotation with Volvulus (contd..)

- An immediate upper intestinal contrast study with or without a concomitant colon contrast study confirms the malrotation.
- Laparotomy will reveal the anomaly and the presence of volvulus.
- A Ladd procedure will be done in conjunction with derotation of the bowel.
GI Bleeding

Pit Falls

- Generally, there is always a tendency to rush into diagnostic studies in an infant with GI bleeding. When a thoughtful evaluation of the history and physical examination is indicated.
- This pushed to do something results in hasty or poorly performed studies.
GI Bleeding

Pit Falls

- For eg. Barium in the gastro-intestinal tract will obscure the radio isotope material used to diagnose ectopic gastric mucosa.
- Celiac and mesenteric arteriograms are last resort studies when all others are normal and the bleeding seems to originate from the small intestine or liver.
- So it is rarely necessary to operate on an infant for gastro-intestinal bleeding without first localizing the exact source of haemorrhage.
Conclusions

• As a general rule, if the infant has required transfusions equal to his or her own blood volume to maintain stable vital signs and is continuing to bleed, an operation is in order unless there are medical contra indications or if more than 50 ml of blood/hour is required to maintain an infant’s vital signs an operation is indicated.
Conclusions

Despite the current ability to aggressively investigate neonates, the causes of neonatal GI bleeding remain unexplained in at least 50% of cases.
THANK YOU