



Midgut Malrotation

A situation in which the intestine lies in abnormal position in the peritoneal cavity.

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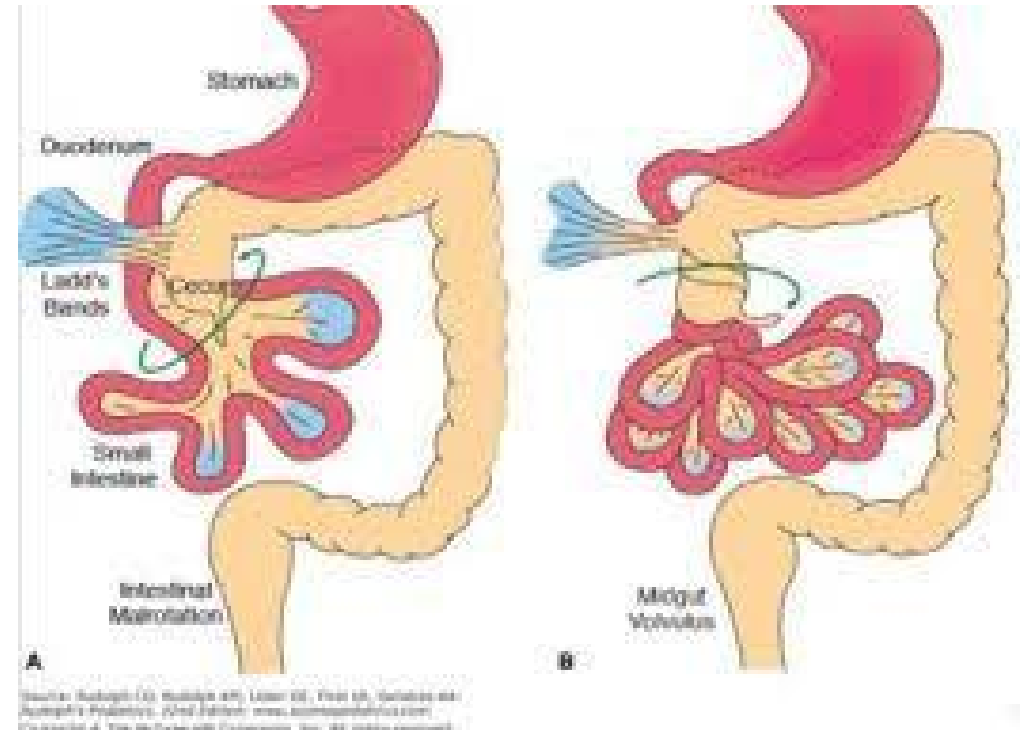
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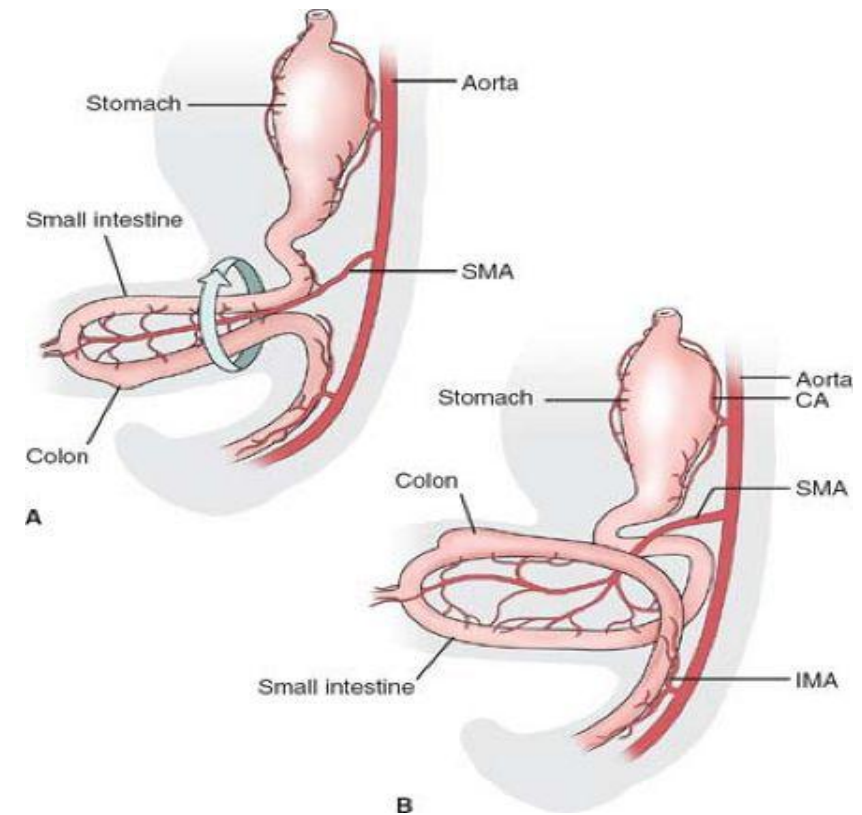
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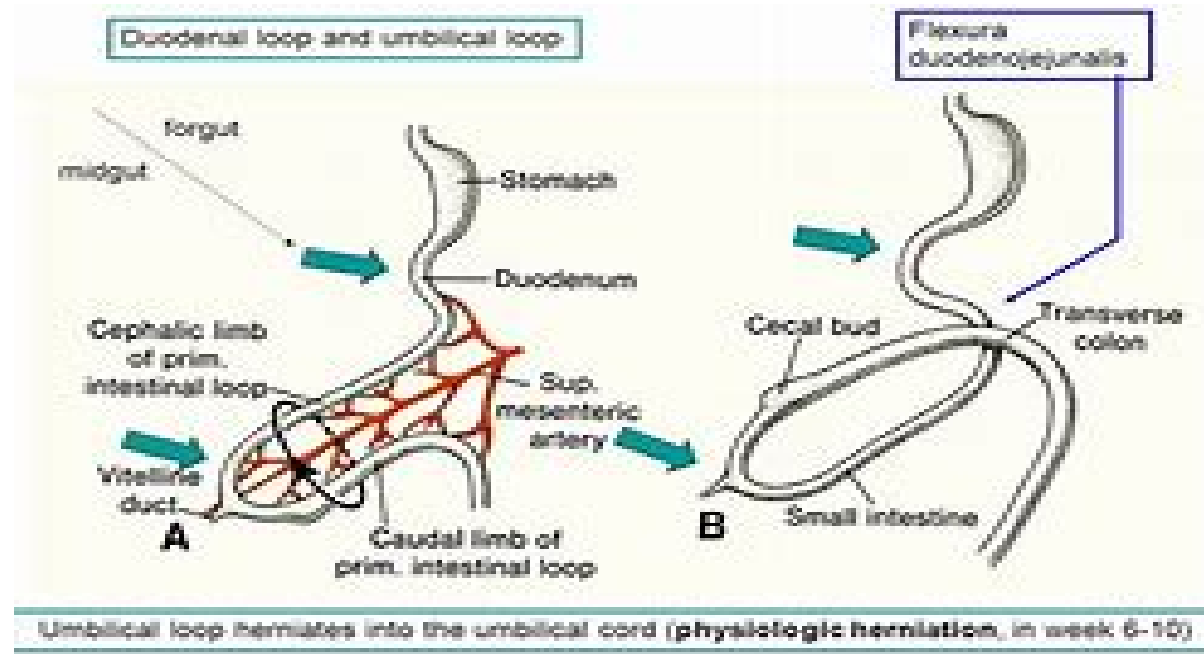
Risk

***Tortion around the SMA axis →
Volvulus of the midgut (Small intestine,
Cecum, Proximal colon) occur most
commonly in the neonatal period →
Intestinal ischemia →
May be fatal if not recognized and treated
immediately.***



- Rapid growth of the gut in 5 & 6 wk of GA →
- Forces the gut to herniate through the umbilical ring into the base of the umbilical cord. (Stage I)

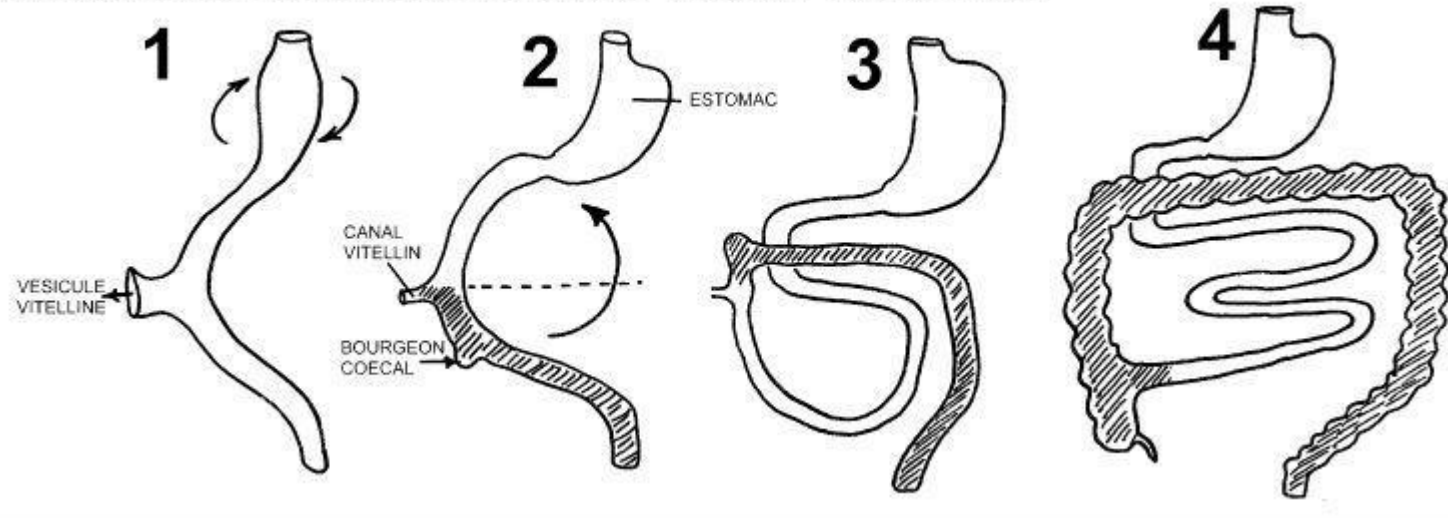






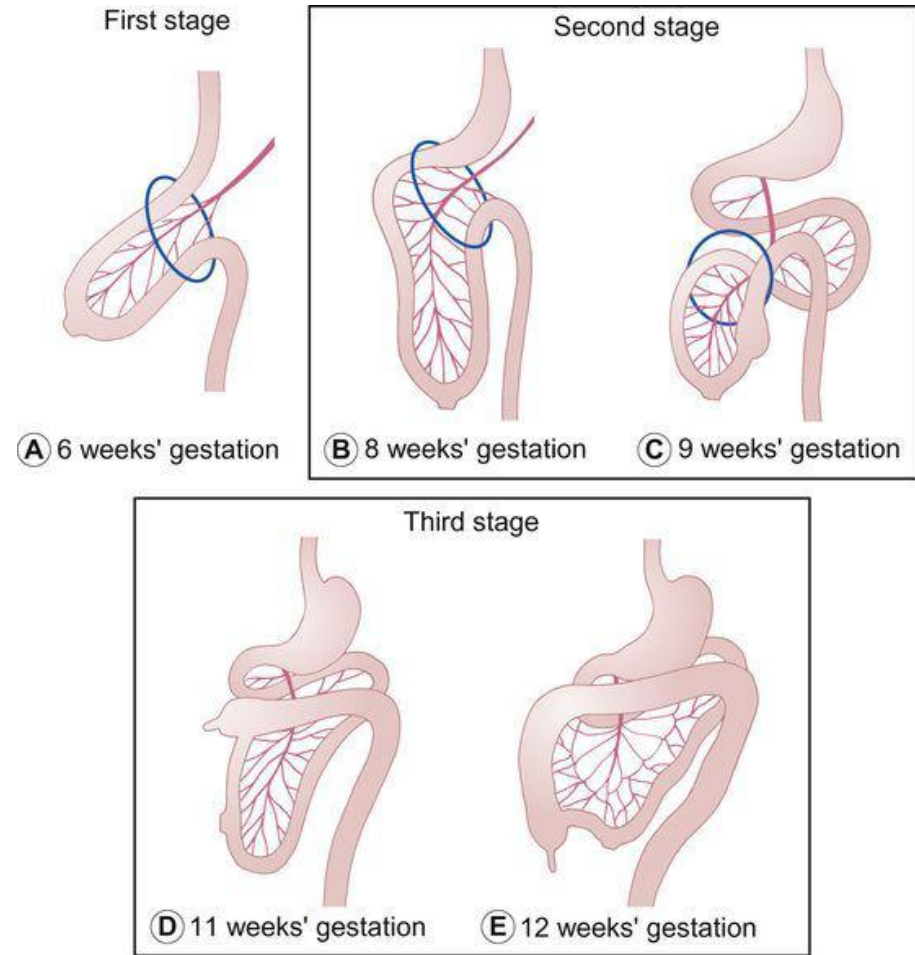
- **Between the 8 & 11 wk (Stage II) the midgut returns to the abdominal cavity un an orderly way:**
- **The stomach and duodenum rotate in an anticlockwise direction around the midgut Ar (SMA).**
- **The duodenum lies initially towards the Rt. And then curves to the Lt. wher it is fixed by a peritoneal fold (the ligament of Trietz), to the Lt of the vertebral column.**

EMBRYOLOGIE DIGESTIVE : DEVELOPPEMENT INTESTINAL

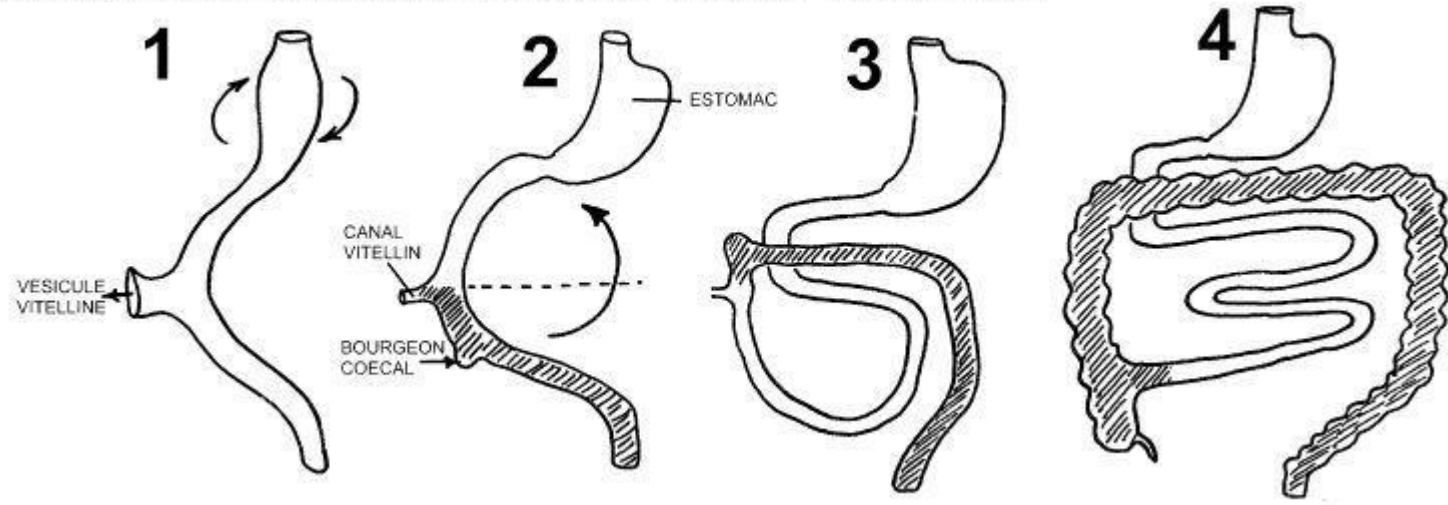




**(Stage III): The distal part of the midgut returns to the •
abdomen also rotating in an anticlockwise direction bringing
the cecum to its final position in the Rt lower abdomen
where it is fixed by peritoneum to the post. Abdominal wall.**

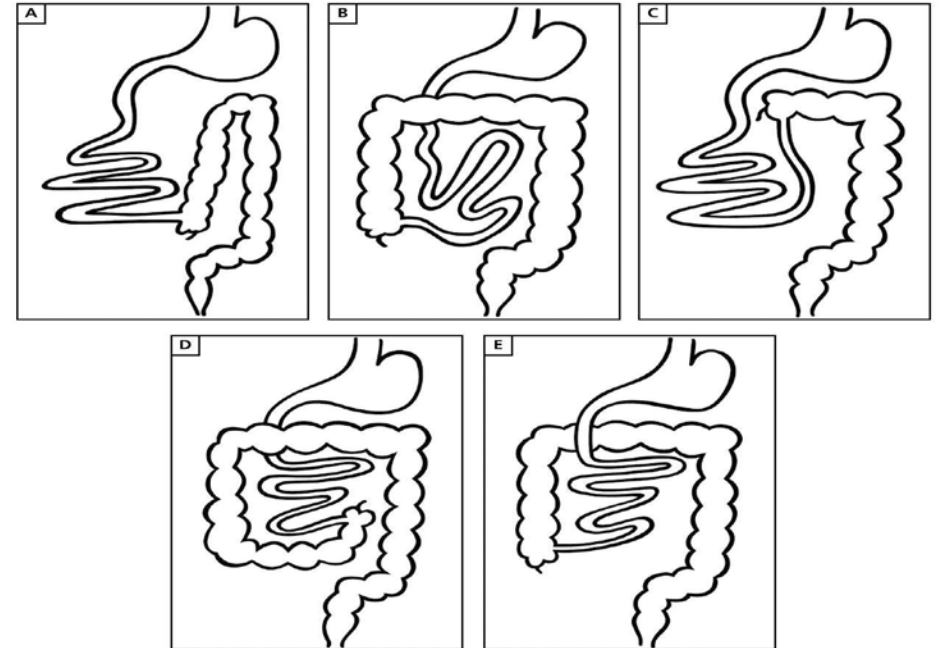


EMBRYOLOGIE DIGESTIVE : DEVELOPPEMENT INTESTINAL



Malrotation

- **Malrotation**= Failure of intestinal rotation to normal position when intestine moves from the umbilical cord hernia back into the peritoneal cavity during the first trimester.





Several configurations of abnormal gut rotation have been described.

The common form= Non rotation

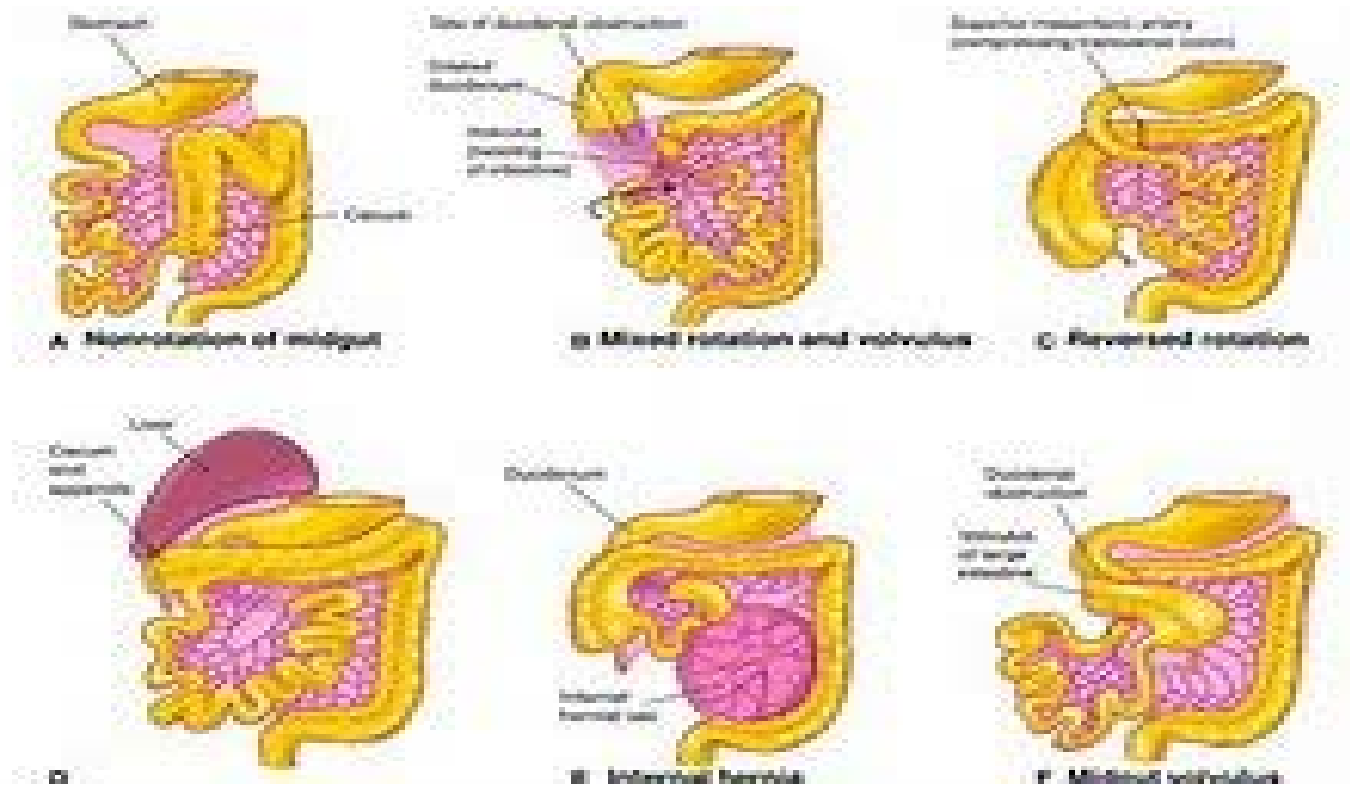
1. Duodenum lies to the Rt of the vertebral column instead of curving across to the Lt. => Ligament of Trietz lies to the Rt of the midline.



- **2. The cecum lies in the upper abdomen to the Lt of duodenum.**

**.A band of peritoneum (Ladd's band) passes from the cecum •
across the duodenum to be attached to posterior abdominal
wall to the Rt of the duodenum => Extrinsic obstruction of the
duodenum => Vomiting ,...**

4. The midgut which normally has long attachment through its mesentery obliquely to the posterior abdominal wall is instead suspended from a narrow attachment confined to the base of the SMA (narrow pedicle) => Volvulus (Usually in a clockwise direction) at any time but most common in the neonatal period => Fatal midgut ischemia.



Other forms

- **Other forms are uncommon and may lead to internal hernia formation with a risk of incarceration and obstruction => Failure of the cecum to be fixed to the posterior abdomen (nonfixation) => will allow it to flip from side to side in the abdomen => Intermittently obstructed. In this situation usually the duodenum has rotated normally.**



incidence

- **The true *incidence* of malrotation in GP is not known, because the anomaly may remain asymptomatic throughout life.**

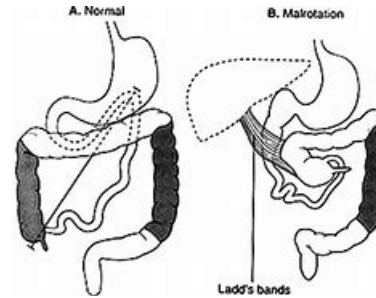


Clinical Presentation

**The true *incidence* of malrotation in GP is not known, because •
the anomaly may remain asymptomatic throughout life.**

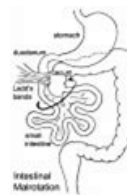
Clinical presentation

Acute midgut volvulus





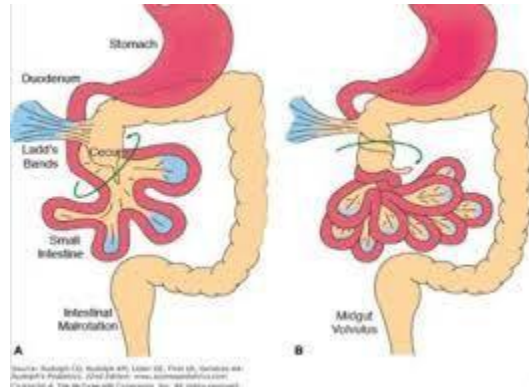
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Clinical Presentation

1. Acute midgut volvulus

- **Most frequently encountered in the newborn infant.**
- ***Symptomes/Signs:**
- **Bilious vomiting**
- **Abdominal pain**
- **Progressive abdominal distention**
- **Tenderness**
- **Stools may be passed in the early stages**
- **The passage of blood suggests intestinal ischemia => Progressive midgut ischemia => The infant rapidly deteriorates with :**
- **Hypovolemia and persistant metabolic acidosis despite fluid resuscitation**



Clinical Presentation

1. Acute midgut volvulus

- **Plain Abdominal radiograph = Features of duodenal obstruction:**
- **The bowel may contain more fluid than air with resultant opacification of the abdominal cavity.**



Clinical Presentation

1.Acute midgut volvulus

***Management:**

- **Surgery consult (immediately)**

If the situation allows, an upper GI contrast radiograph will show the abnormal configuration of the duodenum



▪ **FIGURE 5-12 Malrotation.**

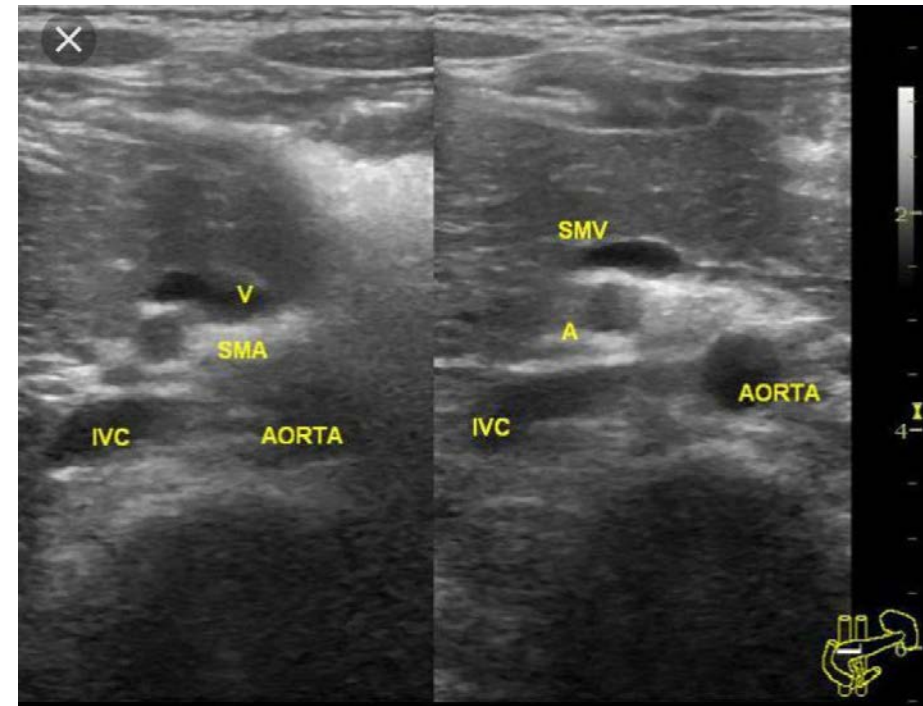
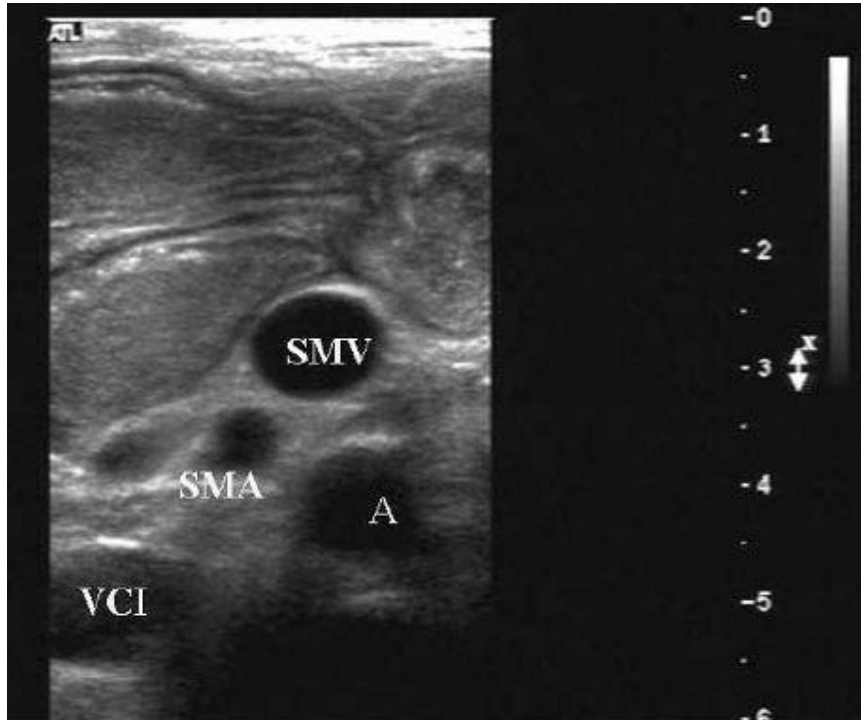
The duodenum courses rightward and never crosses the spine. The opacified proximal small bowel is in the right upper quadrant. The unopacified colon is in the left abdomen.



**US may reveal the abnormal anatomical relationship of the •
SMA and SMV.**

Ultrasound

May show an inversion in the SMA/SMV relationship with the SMA on the right and the SMV on the left.





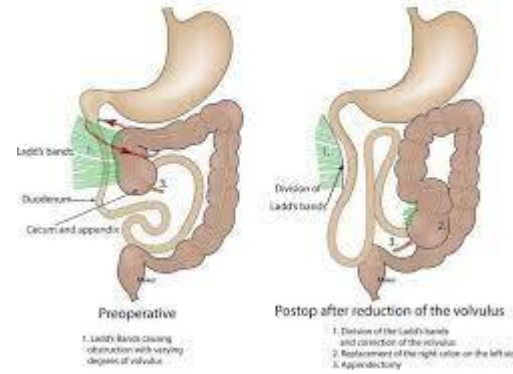
After rapid attention to fluid & electrolyte abnormalities a generous supra umbilical transverse incision for delivery and inspection whole of the small and large bowel:

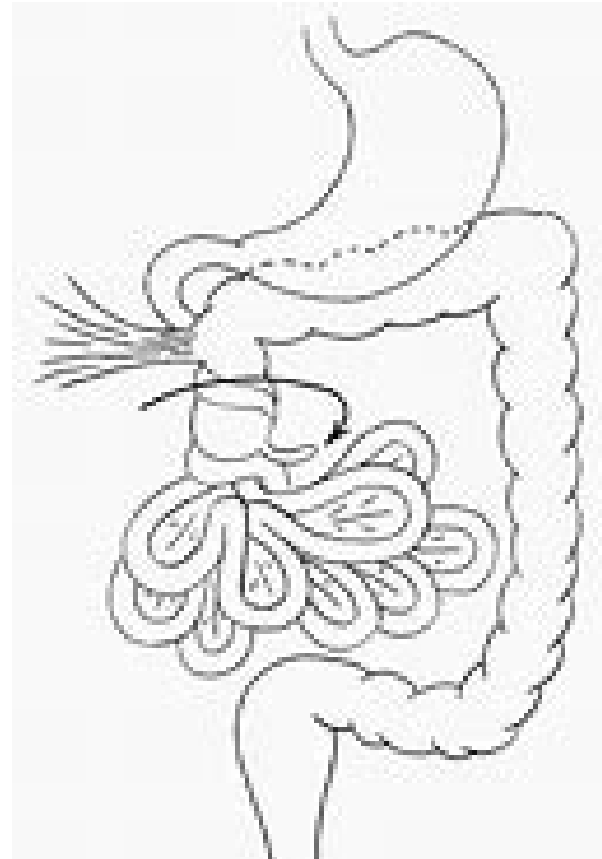
- If a volvulus is confirmed, it is derotated usually in an anticlockwise direction to allow restoration of the mesenteric circulation.**
- And if intestine is viable, the Ladd's band extending from the cecum across the duodenum are divided => This enables the cecum to be mobilized toward the Lt to widen mesenteric pedicle in order to reduce the risk of the volvulus recurring(Ladd's procedure)**

Clinical presentation

2. Extrinsic obstruction of D2

Malrotation of the Midgut



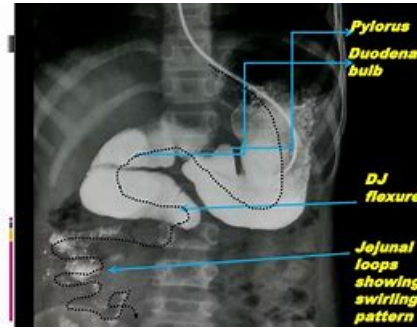




Malrotation



Malrotation





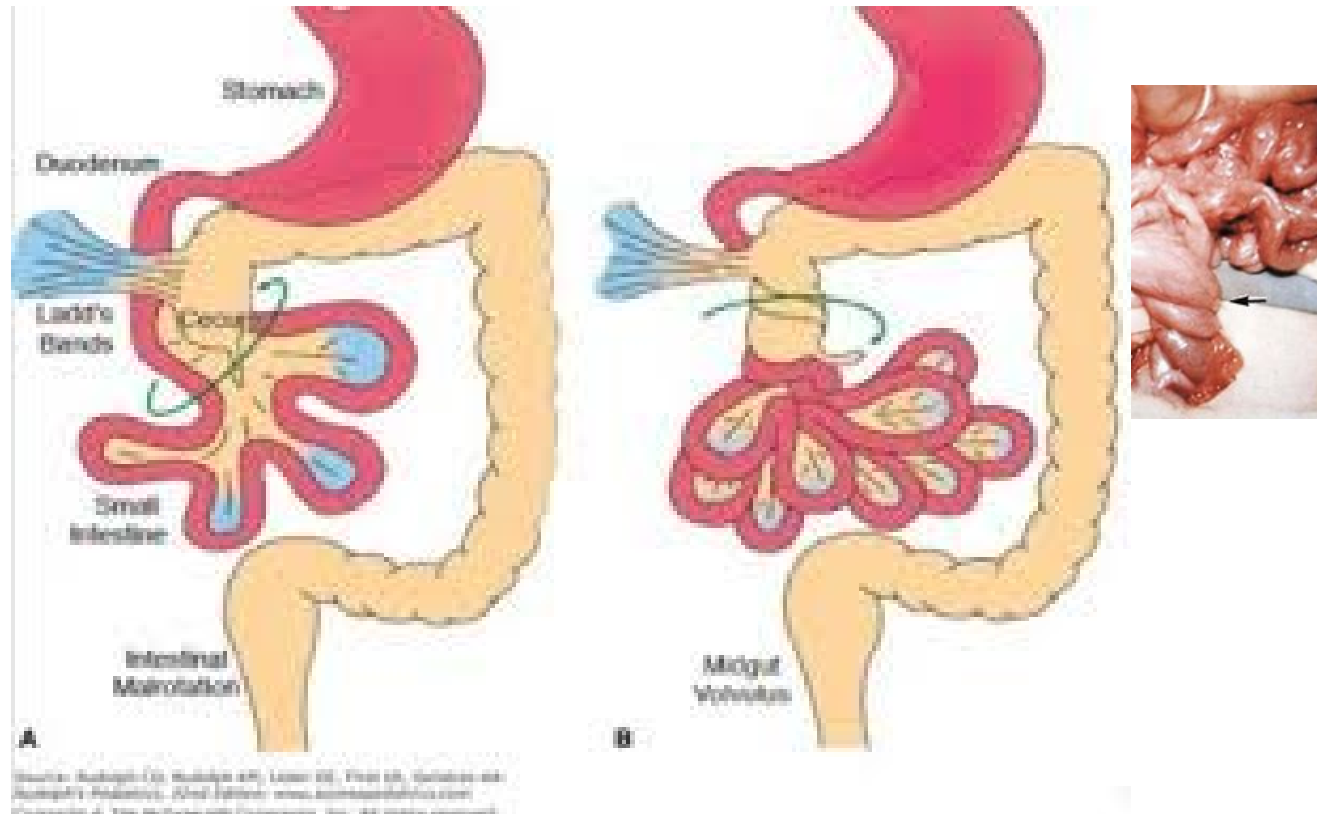
Malrotatoion



Malrotation



Volvulus

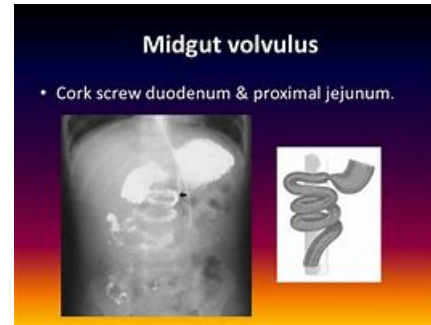


Volvulus

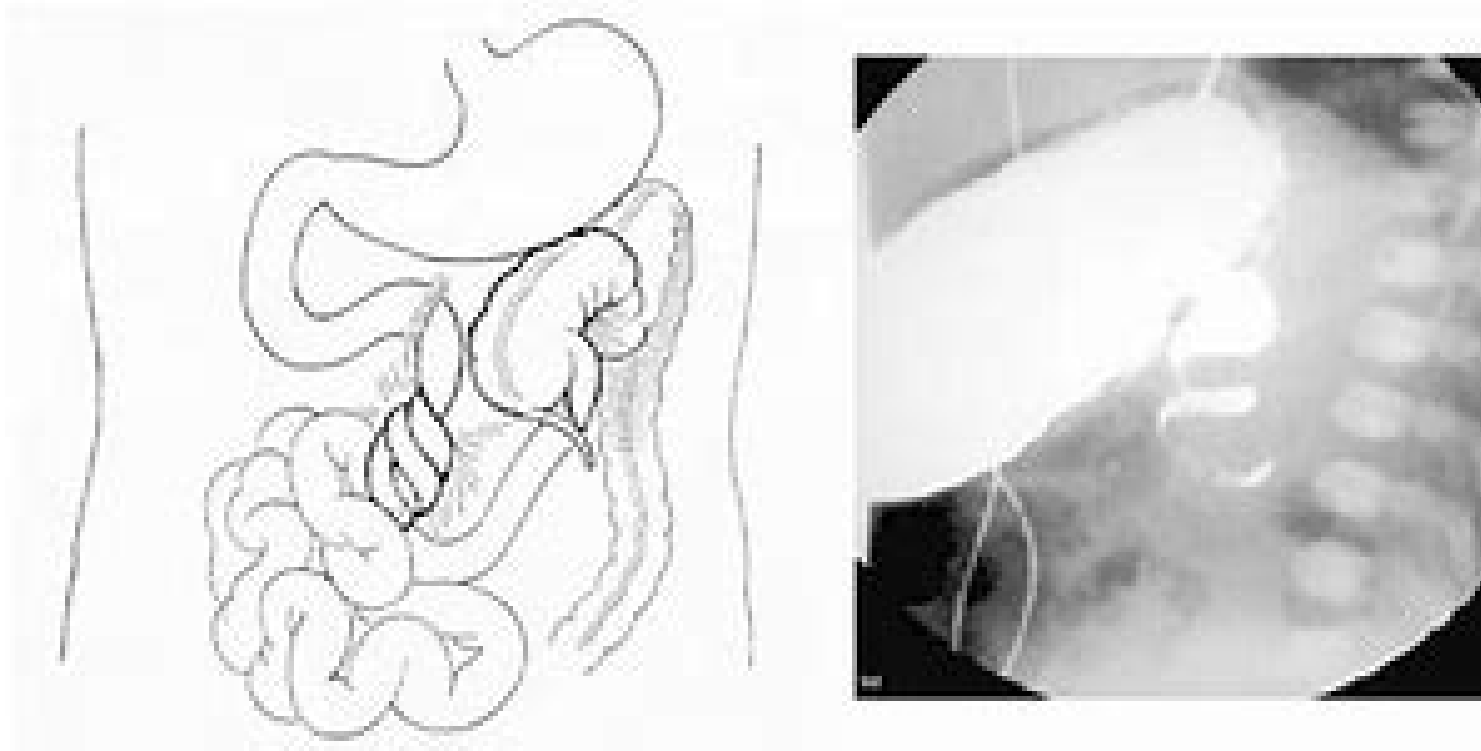




Volvulus

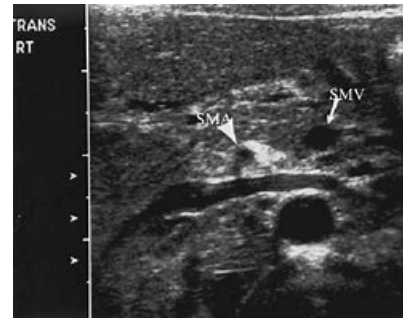


Volvulus





Volvulus





Take Home Message

- **the anomaly may remain asymptomatic throughout life.**
- ***Clinical Presentation***
 1. **Acute midgut volvulus (Acute obstruction)**
 2. **Obstruction of D2 (Recurrent vomiting)**

So in these conditions Upper GI Series must be done