CONGENITAL OBSTRUCTIONS OF UPPER GI TRACT-INVESTIGATIONS

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- Intestinal obstruction can be further classified as either intrinsic or extrinsic based on underlying etiology. Intrinsic causes include inherent abnormalities of intestinal innervation, mucus production, or tubular anatomy. Among these, congenital disruption of the tubular structure is most common and can manifest as obliteration (atresia) or narrowing (stenosis) of the intestinal lumen. More than 90% of intestinal stenosis and atresia occurs in the duodenum, jejeunum, and ileum. Rare cases occur in the colon, and these may be associated with more proximal atresias.
- Extrinsic causes of congenital intestinal obstruction involve compression of the bowel by vessels (e.g., preduodenal portal vein), organs (e.g., annular pancreas), and cysts (e.g. duplication, mesenteric). Abnormalities in intestinal rotation during fetal development also represent a unique extrinsic cause of congenital intestinal obstruction. Malrotation is associated with inadequate mesenteric attachment of the intestine to the posterior abdominal wall, which leaves the bowel vulnerable to auto-obstruction due to intestinal twisting or volvulus. Malrotation is commonly accompanied by congenital adhesions that can compress and obstruct the duodenum as they extend from the cecum to the right upper quadrant.
- Obstruction is typically associated with bowel distention, which is caused by an accumulation of ingested food, gas, and intestinal secretions proximal to the point of obstruction. As the bowel dilates, absorption of intestinal fluid is decreased and secretion of fluid and electrolytes is increased. This shift results in isotonic intravascular depletion, which is usually associated with hypokalemia. Bowel distention also results in a decrease in blood flow to the obstructed bowel. As blood flow is shifted away from the intestinal mucosa, there is loss of mucosal integrity. Bacteria proliferate in the stagnant bowel, with a predominance of coliforms and anaerobes. This rapid proliferation of bacteria, coupled with the loss of mucosal integrity, allows bacterial to translocate across the bowel wall and potentially lead to endotoxemia, bacteremia, and sepsis.

INTRISIC

Esophageal atresia

Ihps

Gastric outlet obstruction

Gastric volvulus

Gastric duplications

Duodenal atresia

Extrinsic

Lads band/malrotation

Annular pancreas

Investigations

Duodenal atresia

- The diagnosis is suggested by the presence of a “double-bubble” sign on a plain abdominal radiograph The appearance is caused by a distended and gas-filled stomach and proximal duodenum, which are invariably connected. Contrast studies are occasionally needed to exclude malrotation and volvulus because intestinal infarction can occur within 6-12 hr if the volvulus is not relieved. Contrast studies are generally not necessary and may be associated with aspiration.
- Prenatal diagnosis of duodenal atresia is readily made by fetal ultrasonography, which reveals a sonographic double-bubble

Ihps

- Two imaging studies are commonly used to establish the diagnosis. Ultrasound examination confirms the diagnosis in the majority of cases. Criteria for diagnosis include pyloric thickness 3-4 mm, an overall pyloric length 15-19 mm, and pyloric diameter of 10-14 mm (Fig. 321-2). Ultrasonography has a sensitivity of ~95%. When contrast studies are performed, they demonstrate an elongated pyloric channel (string sign), a bulge of the pyloric muscle into the antrum (shoulder sign), and parallel streaks of barium seen in the narrowed channel, producing a “double tract sign”

Gastric outlet obstruction

- The diagnosis of congenital gastric outlet obstruction is suggested by the finding of a large, dilated stomach on abdominal plain radiographs or in utero ultrasonography. Upper gastrointestinal (GI) contrast series is usually diagnostic and demonstrates a pyloric dimple. When contrast studies are performed, care must be taken to avoid possible aspiration. An antral web may appear as a thin septum near the pyloric channel. In older children, endoscopy has been helpful in identifying antral webs

Gi duplication

- Radiographic studies usually show a paragastric mass displacing stomach. Ultrasound can show the inner hyperechoic mucosal and outer hypoechoic muscle layers that are typical of GI duplications

Gastric volvulus

- The diagnosis is suggested in plain abdominal radiographs by the presence of a dilated stomach. Erect abdominal films demonstrate a double fluid level with a characteristic “beak” near the lower esophageal junction in mesenteroaxial volvulus. The stomach tends to lie in a vertical plane. In organoaxial volvulus, a single air-fluid level is seen without the characteristic beak with stomach lying in a horizontal plane. Upper GI series has also been used to aid the diagnosis

Esophageal atresia

- In the setting of early-onset respiratory distress, the inability to pass a nasogastric or orogastric tube in the newborn suggests esophageal atresia. Maternal polyhydramnios might alert the physician to EA. Plain radiography in the evaluation of respiratory distress might reveal a coiled feeding tube in the esophageal pouch and/or an air-distended stomach, indicating the presence of a coexisting TEF (). Conversely, pure EA can manifest as an airless scaphoid abdomen. In isolated TEF (H type), an esophagogram with contrast medium injected under pressure can demonstrate the defect (). Alternatively, the orifice may be detected at bronchoscopy or when methylene blue dye injected into the endotracheal tube during endoscopy is observed in the esophagus during forced inspiration

Malrotation

- The abdominal plain film is usually nonspecific but might demonstrate a gasless abdomen or evidence of duodenal obstruction with a double-bubble sign. Barium enema usually demonstrates malposition of the cecum but is normal in up to 20% of patients. Upper gastrointestinal series is the imaging test if choice and the gold standard in the evaluation and diagnosis of malrotation and volvulus. It is the best exam to visualize the malposition of the ligament of Treitz and can also reveal a corkscrew appearance of the small bowel or a duodenal obstruction with a “bird's beak” appearance of the duodenum. Ultrasonography demonstrates inversion of the superior mesenteric artery and vein. A superior mesenteric vein located to the left of the superior mesenteric artery suggests malrotation. Malrotation with volvulus is suggested by duodenal obstruction, thickened bowel loops to the right of the spine, and free peritoneal fluid.

+Supporting investigations in a sick child

Electrolytes= na,k,.cl.abg