Management of Acute Large Bowel Obstruction

Essay
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Introduction

Acute Large bowel obstruction (ALBO) is an emergency condition that requires early identification and intervention. The etiology of LBO is age dependent. There are difference causes of ALBO that varies neoplasms or anatomic abnormalities, such as volvulus, incarcerated hernia, stricture or faecal impaction. As an emergency, the challenge in managing this condition is to varifies the different causes of acute large bowel obstruction, rule out non surgical causes, and determine the best surgical management. ***(Lopez-Kostner F, 2006).***

Mechanical obstruction of the large bowel causes bowel dilation above the obstruction. This causes mucosal edema and impaired venous and arterial blood flow to the bowel. Bowel edema and ischemia increase the mucosal permeability of the bowel, which can lead to bacterial translocation, systemic toxicity, dehydration, and electrolyte abnormalities. Bowel ischemia can lead to perforation and fecal soilage of the peritoneal cavity. ***(Nagata K, 2008).***

Pseudo-obstruction is a deceiving cause of LBO and the patho-physiology of acute colonic pseudo-obstruction (ACPO) is not clear, but it is thought to result from an autonomic imbalance, which results from decreased parasympathetic tone or excessive sympathetic output. ***(Fazel A, 2005).***

Large Bowel Obstruction is less frequent than its small bowel counterpart. It remains, nonetheless a common surgical emergency. Most patients are over 70 years old. The main causes of large bowel obstruction are malignancy, and volvulus of sigmoid colon, the prevalence of both being subject to wide geographical variability. ***(Finan PJ, 2007).***

Colorectal cancer is particularly prevalent in the west, accounting for three-quarters of cases of LBO. This proportion alters in Africa and Eastern Europe where sigmoid volvulus is the cause of obstruction in up to 40% of cases. Approximately 50% arise in the rectum and rectosigmoid area. Another 25% occur in the sigmoid colon, and the remaining 25% are evenly distributed throughout the remainder of the colon. Less common causes of LBO are diverticular disease, either as a result of stricture or acute inflammation with oedema, and obstructed groin hernia. Inflammatory bowel disease is unusual cause of obstruction but strictures from any cause may precipitate obstruction by proximal faecal impaction. ***(Van Hooft JE, 2008).***

The morbidity and mortality often are related to the surgical procedure used to relieve the colonic obstruction, time of intervention and in the long term, to the underlying disease that caused the obstruction. The mortality rate is 15% with early intervention; this increases to 36% if colonic ischemia or perforation develops. ***(Forloni B, 1998).***

Colonic obstruction is most common in elderly individuals because the incidence of neoplasms and other causative diseases is higher in this population. In neonates, colonic obstruction may be caused by an imperforate anus or other anatomic abnormalities, meconium ileus. ***(Losanoff JE, 2007).***

AIM OF WORK

To highlight the different diagnostic modalities and management of Acute Large Bowel Obstruction.

Anatomy

COLON

GENERAL CONFIGURATION

The colon differs from the small bowel in that it is characterized by a saccular appearance, it contains three taenia bands, and it has appendices epiploicae. The transition from the sigmoid colon to the rectum is characterized by the taeniae coli spreading out from three distinct bands to a uniformly distributed layer of longitudinal smooth muscle that is thicker on the front and back than on each side ***(Morson BC, 1995).***

COURSE AND RELATIONS

Cecum is a blind pouch, which project below ileocecal iunction and lies over iliacus and psoas fascia and femoral nerve. Peritomeum covers its front and both sides. The appendix opens into its posteromedial wall

Ileocecal valves formed by the superior and inferior ileocecal ligaments that helps maintain the angulation between the ileum and the cecum. Kumar founds these structures to be important in the maintenance of competence against reflux at the ileocecal junction. Removal of mucosa at the ileocecal junction or a strip of circular muscle did not impair competence ***(Kumar D, 2004).***

Ascending colon extends from ileocecal junction the colon ascends on the right in front of the quadratus and transversus muscles to a level of the lower pole of the right kidney, a distance of about 20 cm. Superior to the colon is the undersurface of the right lobe of the liver, lateral to the gallbladder, and here the colon angulates acutely medially, downward, and forward, forming the hepatic flexure. Occasionally there is a firmly web of adhesions extending from the right abdominal wall to the anterior

taenia of the ascending colon, and this has been referred to as Jackson's membrane ***(Goligher JC, 1995)***.

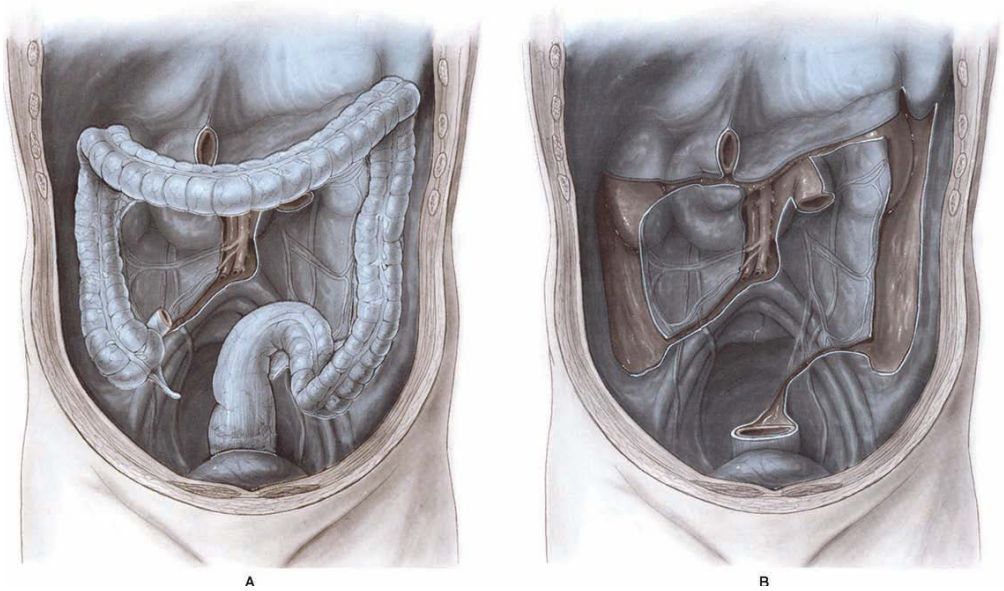

Fig. (1): General topography of the large bowel. (A) Colon. (B) Peritoneum and adjacent structures.

Transverse colon (45cm) extends from the hepatic to the splenic flexure. The transverse colon is enveloped between layers of the transverse mesocolon, the root of which overlies the right kidney, the second portion of the duodenum, the pancreas, and the left kidney. It contains the middle colic artery, branches of the right and left colic arteries, and veins, lymphatic structures, and autonomic nerves. These structures are subject to injury during a right hemi-colectomy. In the left upper quadrant, it is attached to the undersurface of the diaphragm at the level of the 10th and 11th ribs by the phrenocolic ligament. The stomach is immediately above and the spleen is to the left. The greater omentum descends from the greater curvature of the stomach in front of the transverse colon and ascends to the upper surface of the transverse colon. The splenic flexure describes an acute angle, is high in the left upper quadrant, and therefore is less accessible to operative approach. It lies anterior to the midportion of the left kidney ***(Goligher JC, 1995).***

Descending colon passes along the posterior abdominal wall over the lateral border of the left kidney, descends in between the psoas and the quadratus muscles to its junction with the sigmoid at the level of the pelvic brim. Its length averages 30 cm. The anterior, medial, and lateral portions of its circumference are covered by peritoneum. The distal portion of the descending colon is usually attached by adhesions to the posterior abdominal wall, and these adhesions require division during mobilization of this portion of the colon.

Sigmoid colon extends from the pelvic brim to the sacral promontory, where it continues as the rectum. Its length varies dramatically from 15 to 50 cm, and. It has a generous mesentery and is extremely mobile. The serosal surface has numerous appendices epiploicae. The base of the mesocolon extends from the iliac fossa, along the pelvic brim, and across the sacroiliac joint to the second or third sacral segment; in so doing, it forms an inverted V. Contained within the mesosigmoid are the sigmoidal and superior rectal arteries and veins, lymphatics, and autonomic nerves.

At the base of the mesosigmoid is a recess, the intersigmoid fossa, which serves as a valuable guide to the left ureter, lying just deep to it ***(Goligher JC, 1995)***.

PERITONEAL COVERINGS

The cecum usually is entirely enveloped by peritoneum. The ascending colon is attached to the posterior body wall and is devoid of peritoneum in its posterior surface; thus, it does not have a mesentery. The transverse colon is invested with peritoneum. Its posterosuperior surface, along the taenia band, is attached by the transverse mesocolon to the lower border of the pancreas. The posterior and inferior layers of the

greater omentum are fused on the anterosuperior aspect of the transverse colon. To mobilize the greater omentum or to enter the lesser sac, the fusion of the omentum to the transverse colon must be dissected. Because the omental bursa becomes obliterated caudal to the transverse colon and toward the right side, the dissection should be started on the left side of the transverse colon ***(Haubrich WS, 1998)***.

RECTUM

Surgeons consider the rectum to begin at the level of the sacral promontory. It descends along the curvature of the sacrum and coccyx and ends by passing through the levator ani muscles, at which level it abruptly turns downward and backward to become the anal canal. It measures 12–15cm in length and lacks a mesentery, sacculations, and appendices epiploicae. The rectum describes three lateral curves. On their inner aspect these infoldings into the lumen are known as the valves of Houston, which must be negotiated during successful proctosigmoidoscopic examination, and that they are an excellent location for a rectal biopsy ***(Houston J, 1990)***.

It is related posteriorly to the sacrum, coccyx, levator ani, coccygeal, median sacral vessels, and roots of the sacral nerve plexus. Anteriorly in the male, the extraperitoneal rectum is related to the prostate, seminal vesicles, vasa deferentia, ureters, and urinary bladder; the intraperitoneal rectum may come in contact with loops of the small bowel and sigmoid colon. In the female, the extraperitoneal rectum lies behind the posterior vaginal wall; the intraperitoneal rectum may be related to the upper part of the vagina, uterus, fallopian tubes, ovaries, small bowel, and sigmoid colon. Laterally above the peritoneal reflection, there may be loops of small bowel, adnexa, and sigmoid colon. Below the reflection, the rectum

is separated from the side wall of the pelvis by the ureter and iliac vessels ***(Abramson DJ, 1998)***.

PERITONEAL RELATIONS

The upper third is covered by peritoneum anteriorly and laterally, the middle third is covered only anteriorly, and the lower third is devoid of peritoneum. The middle valve of Houston roughly corresponds to the anterior peritoneal reflection. The posterior peritoneal reflection is usually 12–15cm from the anal verge **(Fig. 2)**.

The distance from the anal verge to the peritoneal reflection is 9 cm anteriorly, 12.2cm laterally, and 14.8 cm posteriorly for females, and 9.7cm anteriorly, 12.8cm laterally, and 15.5cm posteriorly for males, which indicates that the peritoneal reflection is located higher on the rectum than reported in autopsy studies, and that there is no difference between males and females. Location and position of a rectal carcinoma in relationship to the peritoneal reflection will help the surgeon optimize the use of peranal techniques of resection ***(Najarian MM, 2004).***

FASCIAL ATTACHMENTS

Fascia Propria (Investing Fascia)

The posterior part of the rectum, the distal lateral two thirds, and the anterior one third, are devoid of peritoneum, but they are covered with a thin layer of pelvic fascia, called fascia propria or the investing fascia ***(Garavoglia M, 1993).***

Waldeyer's Fascia

The sacrum and coccyx are covered with a strong fascia that is part of the parietal pelvic fascia. Known as Waldeyer's fascia, this presacral fascia covers the median sacral vessels. This fascia should be sharply divided with scissors or electrocautery for full mobilization of the rectum **(Fig. 3)** ***(Crapp AR, 1994)***.