

COLONOSCOPIC PERFORATIONS

Complications of Colonoscopy

- Overall complications: 0.4% diagnostic, 1.4% therapeutic, 0.02% mortality (usually perforation or severe cardiopulmonary reactions)
- Cardiopulmonary <1%
 - Hypotension, respiratory depression – usually associated with sedation or vasovagal response; Risk Factors – age, previous cardiopulmonary disease
- Bacteremia <5%
 - Prosthetics (valves, vascular grafts) – antibiotic prophylaxis
- Post polypectomy syndrome 1%
 - Transmural burn in bowel wall
 - Present within few days with fever, local peritonitis, leukocytosis, no free air
 - Treat with bowel rest, antibiotics, hydration
- Bleeding (rare 0.02% in diagnostic, 1% in therapeutic)
 - Mainly post-polypectomy
 - Risk Factors: large polyp, wide stalk, coagulopathy, inexperience
- Perforation
 - .2% in diagnostic, .3% in therapeutic

Etiology/Mechanism of Perforation

- Mechanical
 - “Slide by” perforation – advancing tip of scope along mucosal wall without viewing lumen
 - Bowing portion of scope away from tip
 - Stretching of bowel – longitudinal tear on antimesenteric side
 - Sigmoid colon
 - Tip injury – diverticulosis – mistaken orifice for bowel lumen
 - Overall – sigmoid most common due to redundancy (bow injury), narrowing from diverticular disease, adhesions from pelvic operations
 - Barotrauma
 - Insufflation of air induces enough pressure to rupture colon
 - Right colon more susceptible – Laplace’s law (tension proportional to cylinder radius)
 - Perforation begins with serosal tearing, then mucosal disruption
 - Colonoscopic tip impacted in diverticula can perforate with air insufflation
 - Therapeutic related
 - Instruments (brushes, biopsy forceps, dilators) can directly perforate
 - Thermal injury of bowel wall during polypectomy
 - Grasping of pedicles too close to wall, sessile polyps, accidental grasping of normal mucosa
 - Combustible colonic gases (hydrogen, methane) – one case of explosion
 - Less with polyethylene glycol preps
- => 50/50 mechanical vs therapeutic, rarely barotrauma

Risk Factors

- Uncooperative patient
- Transmural inflammation
- Colonic strictures
- Colonic adhesions
- Friable tumors
- Extensive diverticulosis
- Poor colonic preparation
- Inexperience

Symptoms and Presentation

- Variable presentation symptoms and timing (immediate to days after)
- Immediately noticed – appearance of other bowel, mesenteric fat, vessels thru scope
- Sudden onset pain
- Difficulty maintaining insufflation
- Most commonly, persistent abdominal pain, peritoneal signs, distention, fever, tachycardia, leukocytosis
- Subcutaneous emphysema scrotum, abdomen, chest

Diagnosis

- Plain X-rays – free air, retroperitoneal gas along psoas, pneumatosis intestinalis
- CT – free air, bowel wall thickening, unexplained peritoneal fluid, extravasation of contrast
- Contrast studies – allows gauging of size, extent of injury – free rupture vs contained injury

Treatment

- Immediate bowel rest, IV resuscitation, broad spectrum antibiotics
- Surgical vs Medical treatment based on:
 - mechanism and size of injury
 - adequacy of bowel prep
 - pre-existing underlying pathology of colon
 - medical condition of patient
- Medical treatment
 - “mini perforations”
 - no signs of diffuse, spreading peritonitis, only local tenderness
 - healthy medical condition
 - Injuries from therapeutic perforations (tend to be smaller, contamination less)
 - Must be monitored for deteriorating status
 - Mortality rare (< operative group) – but patients injuries smaller, patients less sick
- Surgical treatment
 - Large perforation
 - Diffuse peritonitis
 - Presence of concomitant pathology (cancer)
 - Severe Colitis

- Distal obstruction
- Pre-existing co-morbidities
- Deteriorating status during medical treatment
- Mortality 5-10% - but sicker patients

Types of surgical repair

- Primary repair
 - No pre-existing colonic pathology
 - Limited fecal soilage
- Colectomy with unprotected anastomosis
 - If associated colonic pathology needing resection anyway
 - Limited fecal soilage
- Colectomy with protected anastomosis (proximal diversion)
 - significant fecal soilage
 - poor condition of bowel (pancolitis)
 - Patient with comorbidities (leak will be disastrous)
- Colectomy with colostomy (Hartmann's)
 - Gross soilage
 - Unstable patient

ASGE Guidelines. Complications of Colonoscopy. www.asge.org

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September 18, 2003