Surgical Management of Sigmoid Volvulus

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October 18, 2012
Case Presentation

- 20 yo male with abdominal distention, nausea and 1 episode of emesis
- Passed flatus one day prior to admission
- Last bowel movement 5 days ago
- No history of chronic constipation
Case Presentation

- PMH: none
- PSH: none
- Meds: none

VS: T 97.4F BP 136/98 HR 85 RR 16 O2 sat 95%

General: AAO x3, no acute distress

CV: RRR, S1S2 normal

Pulm: clear to auscultation

Abd: soft distended, tympanic to percussion; no bowel sounds, diffusely tender

DRE: no stool in vault, no masses, no gross blood

Lactate: 1.7

A/L: 17/15
CT SCAN

Contrast:
Gantry: 0°
FoV: 390 mm
Time: 808 ms
Slice: 1.25 mm
Pos: -175
FFS

F: STANDARD
mA: 220
120 kV
Image no: 112
Image 112 of 365
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CT SCAN

Contrast:
Gantry: 0°
FoV: 390 mm
Time: 808 ms
Slice: 1.25 mm
Pos: -308.75
FFS

F: STANDARD
mA: 265
120 kV
Image no: 219
Image 219 of 365

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Hospital Course

- HD #1- flexible sigmoidoscopy and decompression w/ rectal tube placement

- HD#2: 3-4 bowel movements - rectal tube removed

- HD#4: Discharged to home
BARIUM ENEMA
BARIUM ENEMA
BARIUM ENEMA

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Clinical Course

- 8/20- Laparoscopic sigmoidectomy
- POD#0- clear liquid diet
- POD#1- advanced diet and discharge to home

Pathology- segment of colon with no significant pathologic changes; margins viable
Outline

- History of volvulus
- Epidemiology of sigmoid volvulus
- Clinical presentation
- Radiography
- Surgical Techniques
- Differential on colonic obstruction
- Questions
History of Volvulus

- "volvere" - to twist or turn
- Ancient Egypt in the Ebers Papyrus
- 400 BC - Hippocrates
- High surgical mortality rates
- 1947 - Bruusgaard
  - Decreased mortality with endoscopic decompression
Incidence, Etiology of sigmoid volvulus

- 3rd most common cause of colon obstruction
  - **LEADING CAUSE OF ACUTE COLON OBSTRUCTION IN DEVELOPING COUNTRIES**
- 2-7% of intestinal obstructions in the US
- Age of onset: 60-70 years; M>F
- Risk factors: chronic constipation, laxatives, colonic motility disorders; pregnancy
Epidemiology of sigmoid volvulus

- Africa, India, the Middle East, and Latin America - 54%!
- Young; 80% male
- High fiber diet
Pathogenesis of sigmoid volvulus

- Redundant loop of sigmoid colon with narrow base of attachment of the mesosigmoid

- Varied degree of torsion:
  - 180° (30%) to 540° (10%)
  - 50% of patients have 360° twist
  - Counterclockwise and 15-25 cm from anus
Clinical Presentation

- Symptoms:
  - Intermittent crampy abdominal pain
  - Progressive distention
  - Nausea and vomiting
  - Constipation or obstipation; empty rectum

- 40-60% have history of previous attacks
Radiographic Studies

- AXR diagnostic 50%
  - Distended loop of bowel extending from LLQ to RUQ
  - “bent inner tube” or “omega”
- Barium enema-90%
  - “bird’s beak”
  - Contraindicated if strangulation is suspected
BARIUM ENEMA OF SIGMOID VOLVULUS

Bird’s beak
CT scan of colonic volvulus
When do we operate?

- (1) possibility of colonic ischemia
  - Fever
  - Leukocytosis
  - Elevated lactic acid level

- (2) failure of endoscopic detorsion

- If successful endoscopic decompression and no ischemic changes → elective resection
Preoperative Preparation

- Correct electrolyte imbalances
- Nasogastric decompression
Surgical Management

- If gangrenous bowel
  - Sigmoid colectomy + end colostomy + mucus fistula or Hartmann’s procedure
- When viable bowel during emergency laparotomy:
  - Simple detorsion
  - Colopexy
  - Mesoplasty
  - Colectomy with colostomy
  - Colectomy with primary anastamosis
Simple detorsion of sigmoid volvulus

- Safest

- Intraoperative time is limited

- 40-50% recurrence rate
  - MUST be followed by a second operative procedure
Sigmoidopexy

- Suturing the sigmoid colon to the anterior abdominal
Mesosigmoidoplasty

- Plicating and shortening the sigmoid mesocolon
- 2-28% recurrence rate
Sigmoid Resection and Primary anastomosis

- Performed safely even in urgent setting
- Surgical resection during the SAME hospital stay is recommended
- 15-20% mortality rates with significant comorbidities

- 2 year follow up of 30 patients there were no wound dehiscence or postoperative abdominal abscess

Laparoscopic sigmoid resection

- Modified lithotomy

- Mobilization of proximal sigmoid and descending colon:
  - Trendelenberg with right side down
Mobilization of distal sigmoid and upper rectum

- Sigmoid retracted cephalad
- Extended to midrectum entering presacral space
- Sigmoid retracted to left and right peritoneum incised
Vascular ligation and exteriorization

- Sigmoid colon anterior and inferiorly to expose mesenteric vessels
- Upper rectum is divided using linear cutting stapler
- Mesorectum divided using linear cutting stapler or harmonic scalpel
- Divided proximal colon brought out through a low midline incision
ANASTOMOSIS

- Purse string inserted and tied around anvil
- Colon returned to abdominal cavity and fascia of wound closed
- Pneumoperitoneum
- Stapler shaft inserted into anus and spike advanced to rectum under direct vision
Sigmoid volvulus: Long-term clinical outcome and review of literature

Patients with sigmoid colon volvulus (N=106)

- Primary resection and anastomosis (N=57)
  - Mortality on the first admission (N=3)
  - Lost to follow-up (N=12)
  - 42 patients eligible for inclusion

- Hartmann’s Procedure (N=49)
  - Lost to follow-up (N=9)
  - Mortality on the first admission (N=4)
  - 36 patients were eligible for inclusion

Mortality during follow-up period (N=5)

Follow-up of 37 patients

Surgery for restoration of bowel continuity (N=26)

- Anastomotic leakage (N=1)
  - No recurrences, but constipation in 17 patients out of 26 (65%) with a median 7.1 years follow-up period

Follow-up of 26 patients

No recurrences, but constipation in 31 patients out of 37 (83%) with a median 7.4 years follow-up period
# Sigmoid volvulus: Long-term clinical outcome and review of literature

| TABLE 1. DEMOGRAPHICS AND OUTCOME OF OUR 63 PATIENTS WHO UNDERWENT A RESECTIONAL PROCEDURE FOR SIGMOID COLON VOLVULUS AND WERE AVAILABLE FOR FOLLOW-UP OVER 5 YEARS LATER |
|---------------------------------|--------|--------|
|                                | PRA    | HP     |
| **N**                          | 37     | 26     |
| **Mean age (yrs) at the end of follow-up period (median (range))** | 67.2 (46 - 81) | 68.2 (50 - 83) |
| **Gender (male/female)**        | 25/12  | 22/4   |
| **Concomitant disease**         | 26     | 16     |
| **Restoration of bowel**        | NA     | 25     |
| **Complications in the second admission** | NA | |
|   Wound infection               | 4      |        |
|   Pulmonary complication        | 3      |        |
|   Anastomotic leakage           | 1      |        |
|   Transient ischaemic attack    | 1      |        |
| **Mortality in the second admission** | NA | 0 |
| **Length of stay (d) in the second admission (median (range))** | NA | 8.8 (5 - 15) |
| **Constipation (N (%))**        | 31 (83%) | 17 (65%) |
| **Recurrence**                  | 0      | 0      |
| **Median follow-up period (yrs)** | 7.4   | 7.1    |

*Concomitant disease included hypertension, atherosclerotic disease, diabetes mellitus, chronic obstructive pulmonary disease and chronic renal failure.

PRA = primary resection and anastomosis; HP = Hartmann's procedure; NA = not applicable.
Cecal Bascule

- Cecal bascule
  - Bowel folds anteriorly and superiorly over a fixed ascending colon
  - No axial rotation of the bowel
  - No mesenteric vascular obstruction
Cecal Volvulus

- Cecal volvulus
  - 10-20 years younger
  - RF: pregnancy, surgery, obstructing lesions, congenital bands/malrotation

- AXR
  - Distended loop of bowel in LUQ with retained haustral marking and RLQ void of cecum

- Surgical resection
ALGORITHM FOR SIGMOID VOLVULUS

1. Sigmoid Volvulus
   - No signs of ischemia
     - Decompressed
       - Elective
         - Resection with 1° anastomosis
         - Nonresection option
   - Possible ischemia
     - Unable to decompress
     - Urgent laparotomy
       - Viable bowel
         - Resection
         - Primary anastomosis
       - Gangrenous bowel
         - Resection
         - Colostomy
References

- Cameron: Current Surgical Therapy, 10th edition
- Fazio: Current Therapy in Colon and Rectum, 2nd edition
A 69 year old man with no co-morbidities presents with the gradual onset of sharp, crampy lower abdominal pain and distention beginning a day previously. 7 years ago he had an episode of sigmoid volvulus that required colonic decompression but declined surgical intervention. 2 years ago his colonoscopy was normal. 24 hours after successful endoscopic decompression with sigmoidoscopy, abdominal distention recurs and AXR confirms recurrent colonic distention.

The next step in management is:
(a) repeat sigmoidoscopy with rectal tube placement
(b) neostigmine infusion
(c) soapsuds enema
(d) sigmoid colon resection
(e) complete colonoscopy
Question 2

All of the following are risk factors for developing sigmoid volvulus except:

(a) Pregnancy
(b) High fiber diet
(c) Chronic constipation
(d) Clostridium difficile
(e) Laxative use
Question 3

A 65 year old institutionalized patient presents with a 2-day history of abdominal distention, nausea and obstipation. Physical exam is significant for marked distention with mild diffuse abdominal tenderness, no guarding or rebound. WBC 10,000 cells/μL. Plain films reveal a massively dilated, inverted U-shaped (omega) loop of bowel. Management should consist of:

(a) Endoscopic detorsion
(b) Endoscopic detorsion followed by elective sigmoid colectomy
(c) Endoscopic detorsion followed by elective sigmoid colectomy if a recurrence
(d) Exploratory laparotomy with sigmoid colectomy, on-table lavage, and primary anastomosis
(e) Exploratory laparotomy with sigmoid colectomy, proximal colostomy and oversew rectal stump
Hirschsprung’s disease

- Congenital megacolon
  - Failure of neural crest cell migration to the distal large intestine
  - Absence of ganglion cells in Auerbach’s plexus
  - Failure of relaxation and functional obstruction
  - Proximal bowel becomes progressively dilated

- Rectoanal manometry