Perforated diverticulitis of the sigmoid colon contained within an inguinal hernia sac

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Background
- Incarcerated inguinal hernias and perforated sigmoid diverticulitis are two different disease processes commonly encountered in general surgery.
- In rare occurrences, such as this case, a perforated sigmoid diverticulitis is found incarcerated in an inguinal hernia.
- The increased risk of sepsis and recurrence presents a significant treatment dilemma.
- The lack of consensus in current literature on treatment warrants investigation in an attempt to establish “best practices”.
- We report the 6th case of a perforated diverticulitis in an inguinal hernia sac and review five previous cases for treatment strategies and outcomes.

Case Presentation
- 61-year-old male presented to the ED with:
  - Left testicular & groin pain
  - Left testicular edema
  - Nausea
  - Loose stool
  - Subjective fever over a 24 period
- Past medical history was relevant for:
  - 6-month history of an asymptomatic chronic left inguinal hernia
- Medications:
  - Diltiazem
  - Hydrochlorothiazide
  - Lisinopril
  - Colchicine
  - Allopurinol
  - Indomethacin
  - Meloxicam
- Patient was of medium build and in moderate distress
- Vitals at presentation:
  - HR 103 bpm; T 110.8; BP 94/59 mmHg
  - The left scrotum was swollen, erythematous, and tender to palpation
  - A non-reducible, exquisitely tender hernia sac was palpable in the left inguinal canal
- Significant admission laboratory values:
  - Leukocytosis of 17,100/mL
  - Creatinine of 1.65mg/dL
- Scrotal ultrasound showed increased Color Doppler blood flow to bilateral epididymis, which appeared bulky and enlarged
- CT of the abdomen/pelvis with IV contrast revealed a left inguinal hernia containing a segment of proximal sigmoid colon with extensive diverticulitis (Figure 1).
- Multiple foci of free air were present within the hernia, suggesting perforation.

Treatment
- An exploratory laparotomy was performed after consent was obtained.
- Revealed an incarcerated hernia containing the proximal sigmoid colon
- The sigmoid colon and mesentery were mobilized from the retroperitoneum
- Distally to the level of the rectum
- Proximally to the mid-descending colon
- The incarcerated sigmoid showed areas of necrosis and fecal staining consistent with a perforation
- Pathology findings were consistent with perforated diverticulitis with abscess
- A segmental sigmoid colectomy and end colostomy (Hartmann’s Procedure) was performed
- The inguinal hernia was not repaired because of fecal contamination and risk of recurrence
- Following recovery, a complete colonoscopy was performed 4 weeks prior to colostomyakedown.
- The left inguinal hernia will then be repaired in an open Lichtenstein fashion with synthetic mesh – 3 months after colostomy reversal

Figure 1: CT abdomen/pelvis with IV contrast

Imaging revealed a left inguinal hernia containing a segment of proximal sigmoid colon with extensive diverticulitis. There were multiple foci of free air within the hernia, suggesting perforation of the herniated segment of colon. There was no evidence of obstruction or pneumoperitoneum.

Literature Review
- Kourakis et al. (2004) described the first incidence of an incarcerated sigmoid colon with a perforated diverticulitis.
- Open sigmoidectomy via midline incision
  - Double-barrel colostomy
  - Colostomy reversal with simultaneous Bassini repair of the inguinal hernia were performed 4 weeks later.
- Tuftef et al. (2008)
  - Perforation caused by antacid tablets (Figure 2)
  - Hartmann’s procedure via laparotomy incision
  - Concurrent Bassini repair of the inguinal hernia
  - Complicated by surgical site infection at the midline laparotomy incision
  - Required prolonged hospital stay of 24 days
- Tantle et al. (2009) report the first and only occurrence on the right side
  - Open right hemicolectomy with primary anastomosis and en bloc resection of the right testis and epididymis
  - Concurrent Bassini repair without mesh
  - Report no hernia recurrence after 1.5 years
- Peterson et al. (2013) were the first to attempt to manage this surgical dilemma without proximal diversion
  - Laparotomy with open sigmoidectomy and primary anastomosis
  - Concurrent modified Bassini repair with Onlay biologic mesh
- Raimond et al. (2016)
  - Open sigmoidectomy with primary colorectal anastomosis
  - Concurrent Bassini repair without mesh
  - Complicated by wound infection in the inguinal incision

Figure 2: Cecal diverticulum with multiple antacid tablets present in lumen [5]

Discussion
- The lifetime incidence of an inguinal hernia [6]:
  - 27% for men
  - 3% for woman
- Risk of strangulation [7]:
  - 2.8-4.5%
- Warrants urgent surgical intervention
- Surgical repair options for an inguinal hernia [8]:
  - Primary repair ± biologic or synthetic mesh
  - Open, laparoscopic, or robotic approaches
- Diverticulitis predominately occurs in the sigmoid colon and correlates with patient age
  - <20% by age 40
  - 60% by age 60
- Most cases of diverticulitis remain asymptomatic; 10-20% progress to diverticulitis [9]
- Characterized by perforation of a diverticulum
  - 35% risk of developing local or diffuse peritonitis [10]
- When incarcerated in an inguinal hernia sac, perforated sigmoid diverticulitis usually leads to focal peritonitis.
- Raises clinical concern for post-operative surgical site infection
- In a contaminated surgical field, the goals of urgent inguinal hernia repair are as follows:
  - Reduction of the hernia sac with amputation or release of its contents
  - Primary repair ± biologic or synthetic mesh
- Some authors suggest use of mesh in a contaminated field is contraindicated [8]
- Contamination from a perforated diverticulitis increases the risk of an anastomotic leak following colon resection
- The goals of urgent sigmoidectomy for perforated diverticulitis are as follows:
  - Resection of diseased bowel followed by one of the following:
    - Hartmann’s procedure (end colostomy)
    - Primary anastomosis ± diverting ileostomy or colostomy
- The American Society of Colon and Rectal Surgeons recommend considering patient factors, surgeon preference, and intraoperative factors when determining the best course of treatment [11].

Take Home Messages
- Perforations of the sigmoid colon into an inguinal hernia sac are very rare.
- There are three options for management of the perforated segment of sigmoid colon based on the standard ASCRS practice guidelines.
- Definitive repair of the inguinal hernia may need to be delayed due to fecal contamination of the inguinal canal-structures used for repair.

References