Colonic Volvulus: a New Twist on an Old Story

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Introduction: in Hippocrates’ Affections, treatment of volvulus involved injecting air into colon through anus and inserting suppository 10 digits (22 cm)-long; variations on these treatments still in use today

Colonic volvulus: incidence — third most common cause of colonic obstruction worldwide; accounts for 2% to 4% of cases of colonic obstruction in United States but ≤50% of cases in “volvulus belt” (ie, Africa, Middle East, India, and Russia)

Sigmoid volvulus: most common type; counterclockwise twist of redundant sigmoid colon; according to Treves (1884), volvulus occurs due to long loop, with long narrow mesocolon at its parietal attachment, which results in 2 ends of loop being in close proximity; chronic constipation most common cause; characteristics of typical patient — male, elderly, constipated, in nursing facility, taking psychotropic medication, with excessive fecal burden

Cecal volvulus: second most common type, characterized by mesoaxial clockwise rotation or cecal bascule (large floppy long cecum that folds upon itself); incidence increasing but still less common than sigmoid volvulus; only small series of studies conducted (but no randomized controlled trials) because of low incidence; patient characteristics — often young, female (possibly during pregnancy), with previous history of surgery involving mobilization of right colon; may relate to developmental abnormality (eg, incomplete fixation of cecum to retroperitoneum)

Transverse colon and splenic flexure: 2% to 4% of volvulus cases; typically occurs in young women; risk factors include pregnancy, chronic constipation, distal colonic obstruction, previous surgery, and lack of ligamentous fixation

Ileosigmoid knotting: extremely rare; ie, “compound volvulus” or “double volvulus”; most common in Middle East, Asia, and Africa, and in men in 40 to 50 yr of age

Case 1 (typical sigmoid volvulus): 84-yr-old man transferred from nursing facility with no bowel movement for 4 days and vomiting; had dementia, hypertension, and chronic constipation; taking several medications; osmotic laxative no longer providing benefit; had history of abdominal operations; on physical examination (PE), patient distended, tympanitic, and tender in left upper quadrant (LUQ); white blood cell (WBC) count highly elevated; abdominal x-ray suspicious for pseudoobstruction; computed tomography (CT) suggested cecal volvulus, which prompted immediate surgery; ischemic cecum found in LUQ; cecum resected and anastomosis performed

Diagnosing colonic volvulus: abdominal pain, constipation, and abdominal distension common to all volvuli; differential diagnosis — includes impaction, carcinoma, diverticulitis, and pseudoobstruction; rectal examination often helpful for distinguishing condition; imaging — plain radiographs often difficult to interpret (if volvulus present, ideally show “bent inner tube,” with convexity in RUQ in sigmoid cases, and in LUQ in cecal cases); CT usually performed, which may show “whirl sign” in left abdomen in sigmoid, and in right abdomen in cecal volvulus (location sometimes unclear)

Treatment of sigmoid volvulus: operate emergently if patient has pneumoperitoneum, peritonitis, elevated WBC, and/or appears toxic; otherwise, if patient reasonable surgical candidate, perform endoscopic detorsion, bowel preparation, and urgent colectomy; colostomy and Hartmann pouch usually performed; anastomosis avoided in most emergency operations; if no signs of gangrene or perforation present, colonoscopy or sigmoidoscopy warranted to allow detorsion of bowel, bowel preparation, decompression of proximal colon, evaluation of colonic mucosa to rule out ischemia and necrosis, and insertion of rectal tube to prevent recurrence; detorsion successful in majority of patients, and allows semielective surgery for operative candidates, including laparoscopic colectomy or anastomosis; nonoperative management — associated with rates of recurrence of 25% to 90% (average 48%); poor surgical candidates may accept palliative care and high recurrence rate; endoscopically assisted placement of T-fasteners may function as sigmoidopexy for some high-risk patients

Treatment of cecal volvulus: presentation varies widely; some associated with early vascular compromise that requires immediate resection, while other cases indolent, progressive, and intermittent (symptoms may resolve without treatment); diagnosis of latter type challenging (may be due to cecal bascule);

Educational Objectives
The goals of this program are to improve the management of conditions of the colon. After hearing and assimilating this program, the clinician will be better able to:

1. Distinguish between the different types of colonic volvulus on the basis of presenting characteristics.
2. Choose appropriate treatment for patients with colonic volvulus.
3. Recognize conditions that contribute to pseudoobstruction.
4. Select optimal diagnostic modalities for diagnosing adult intussusception.
5. Appraise current data on laparoscopic washout for complicated diverticulitis.

Faculty Disclosure
In adherence to ACCME Standards for Commercial Support, Audio Digest requires all faculty and members of the planning committee to disclose relevant financial relationships within the past 12 months that might create any personal conflicts of interest. Any identified conflicts were resolved to ensure that this educational activity promotes quality in health care and not a proprietary business or commercial interest. For this program, members of the faculty and planning committee reported nothing to disclose.
poor success reported with radiographic or endoscopic detec-
tion; reports of needle decompression purely anecdotal; cases
of successful coecopexy or cecectomy reported, but recurrence
rate ≤30% and cecectomy associated with rate of abdominal
complications of 25%, high rate of wound complications, and
relatively high mortality (possibly because procedure typically
performed in high-risk patients); overall, best outcomes seen
with resection

**Pneumatosis and Intussusception in the Era of Dime-a-Dozen Abdominal CTs**

**Dr. Devaney**

**Pneumatosis Intestinalis (PI)**

**Background:** may be incidental benign finding on CT, or may
indicate ischemic organ

PI before advent of CT: originally thought to be primary patho-
logic condition; Koss (1952) found PI secondary to another
condition in 85% of 213 pathology specimens; recognized on
abdominal x-rays; required surgical exploration; associated
with high mortality rate (33%–40%)

PI after advent of CT: PI increasingly found on CT obtained for
other reasons (eg, follow-up of laboratory studies, after can-
ter treatment), many patients who develop PI today would
not have survived in past (eg, bone marrow or heart trans-
plant recipients on immunosuppressive drugs, which may
contribute to PI)

**Antecedents of PI:** chronic obstructive pulmonary disease (ie,
Valsalva maneuver and coughing with closed glottis may allow
air to track down retroperitoneum and into bowel wall); ste-
roid use; scleroderma; surgical procedures (eg, colonoscopic
polypectomy, needle catheter for jejunostomy, bowel resection,
anastomosis); inflammatory diseases; blunt trauma

**Proposed etiologies:** mechanical — intestinal and/or endoscopic
gas enters bowel wall via mucosal defects; pulmonary — severe
coughing ruptures alveoli, thereby causing pneumomediasti-
num; gas dissects into retroperitoneum, travels along vessels,
and into bowel wall; bacterial — can be produced experiment-
tially in animals by injecting gas-forming bacteria into bowel
wall (but probably not common cause in humans)

**Presentation:** may have no symptoms other than incidental find-
ing on CT; nonspecific abdominal pain, diarrhea; symptoms
of associated condition; treatment typically involves treating
underlying condition

**Case 1:** 21-yr-old recently diagnosed with Crohn disease (CD),
presented initially with right abdominal pain, diarrhea, and
blood in stool; placed on budesonide (Entocort, UCeris) and
mesalamine (eg, Asacol, Lialda, Pentasa); condition wors-
ened (became nauseated and lightheaded); had continued
rectal bleeding, diarrhea, abdominal pain, and weight loss;
patient admitted to hospital and placed on methylprednisolone
(Medrol, Solu Medrol); PE revealed distress, tachycardia, with
fever and diffuse tenderness on right side; laboratory findings
included stool positive for occult bleeding, elevated WBC, and
high platelet count (indicating inflammatory condition); CT
showed gas in bowel wall on right; urgent operation showed
severe CD with crepitus in right colon; extended right cec-
tomy and ileostomy performed

**Case 2:** 49-yr-old woman presented 17 yr after heart transplanta-
tion with severe chronic abdominal pain and nausea; appeared
relatively healthy; CT showed PI in wall of small bowel; diffuse
PI but normal bowel seen on exploratory surgery; no resection
performed; ileus resolved slowly and patient recovered bowel
function; discharged after 2 wk

**Studies of management of PI:** single-institution retrospective
review of all patients with PI over 7- to 8-yr period who
had CT; 104 cases of PI found among 28,826 CT scans, 97
of which had complete records; overall mortality 22%; 32
had operation (operative mortality 16% [lower than in other
large series, possibly due to sending 15 “futile” patients to
hospice care]); 50 treated nonoperatively (mortality 6%); in
operative group, nontherapeutic operations performed in
13%, 56% had intestinal ischemia and required bowel resec-
tion, and 18% had other operations; of nonoperative group,
2 patients died of complications of bone marrow transplanta-
tion and one died of diabetic ketoacidosis and acute respira-
tory distress syndrome; other findings — location of PI did
not predict outcome or intervention; PI seen on plain films
in only 23%; presence of portal venous gas in addition to PI
associated with mortality of 43% (warrants aggressive opera-
tive intervention in surgical candidates); conclusion — ≤50%
of PI can be managed nonoperatively

Retrospective review (2011): among 150 consecutive patients,
36% managed nonoperatively, 48% operatively, and 16%
unsalvageable (palliative care only); predictors of positive
operative findings — history of coronary artery disease, tachy-
cardia, tachypnea, hypotension, peritonitis, abdominal
distension, or lactic acidemia; radiographic findings of dilated
bowel loops, portal venous gas, or atherosclerosis; abnormal
PE more predictive than laboratory studies or x-rays

**Intussusception**

**Background:** uncommon cause of bowel obstruction; can occur
anywhere in gastrointestinal (GI) tract, but most common in
enteroenteric, ileocolic, and colocolic regions; ≤90% of adult
cases secondary to another pathologic condition; pediatric
cases — causes and treatment differ from those in adults; most
occur at age <2 yr; etiology edematous Peyer patches, with
ileum invaginating into right colon; most cases hydrostatically
reduced with contrast enema; common presentation includes
colicky pain, “currant jelly stool”, and abdominal mass in right
lower quadrant (RLQ)

**Case:** 79-yr-old woman with end-stage renal disease on hemodi-
alysis presented with cramping, abdominal pain, distension,
nausea, and flatus but no bowel movement for 5 days; had his-
tory of 12-lb weight loss and intermittent reddish stool; had
several illnesses and took variety of medications; PE showed
distended abdomen and fullness in RLQ; WBC elevated;
patient underwent urgent dialysis, then taken to surgery, which
revealed large right abdominal mass, with intussusception of
cecum, extending to proximal transverse colon; en bloc resec-
tion, ileostomy, and long Hartmann procedure performed;
pathology showed large colonic adenocarcinoma, with moder-
ate prognosis

**Proposed pathophysiology:** pathologic lesion irritates bowel
wall, thereby increasing peristalsis, and acts as lead point (can
be intra- or extraluminal, benign or malignant); may result
from invagination into distal bowel (causing partial obstruction);
may compromise mesenteric vascular flow and lead to ischemia;
enteroenteric intussusception more often benign and idiopathic,
whereas ileocolic and colocolic more often malignant

**Diagnosis:** plain abdominal films nonspecific but sometimes
show obstruction site; upper GI series and barium enema
often used in past; ultrasonography may show obstruction, but
bowel gas often limits utility; CT — optimal diagnostic method
because it often shows target sign and lead point; localizes
problem; may aid in staging of malignant disease

**Presentation:** symptoms include pain, nausea, vomiting, consti-
pation, rectal bleeding, diarrhea, abdominal mass, and fever;
can present acutely, subacutely, or chronically; often, small
bowel only partially obstructed; symptoms may last for days
or weeks; palpable mass uncommon; patients usually nontoxic;
may be incidental CT finding

**Management:** surgical in most adult cases; en bloc resection
recommended for ileocolic, colocolic, and ischemic cases;
reduction of intussusception often possible in small bowel
cases because most benign and have palpable lead point; if
needed, reduce bowel length by milking in distal to proximal
direction

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**Audio Digest Gastroenterology** 28:21
New cause of adult intussusception: occurs at jejunoojunal anastomosis following Roux-en-Y gastric bypass; commonly presents after much weight loss

Laparoscopic Washout of Diverticulitis: What Does the Evidence Say?

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Trends in operative management of acute diverticulitis: interest increasing in one-stage resection and anastomosis, with or without diversion; newest trend laparoscopic lavage

Laparoscopic lavage: antibiotics administered; diagnostic laparoscopy performed; if purulent peritonitis found, fluid aspirated and abdominal lavage with several liters of fluid performed; drain placed at surgeon’s discretion; inspection for perforation necessary, with repair if possible

First reports of procedure: most studies small and lacked important end points, such as ICU stay, sepsis parameters, and length of hospital stay; most looked only at feasibility

Prospective multi-institutional study of 100 patients: Myers et al (2008) reported successful treatment with resolution of symptoms and low short-term recurrence rate

Review article on 213 patients: included 8 nonrandomized studies; concluded laparoscopic lavage promising alternative in selected patients

10-yr retrospective review: 35 laparoscopic washouts performed, with success in 27; 5 failures caused by ongoing sepsis

Ladies trial: prospective randomized trial of laparoscopic washout with results not yet reported; one arm of study closed early because of safety concerns; specific concerns not yet published

Conclusion: with currently available data, laparoscopic washout should not be performed unless under auspices of clinical trial or with approval by Institutional Review Board

Acknowledgements

Dr. Deveney was recorded at Medical and Surgical Approaches to GI Disorders, held July 14-18, 2014, in Kiawah Island, SC, and sponsored by Georgia Regents University of the Medical College of Georgia and Division of Professional and Community Education. For information about future CME activities from this sponsor, please visit www.gru.edu/ce/medicalse. Dr. Ault was recorded at the 21st Annual USC National Trauma, Emergency Surgery, and Surgical Critical Care Symposium, sponsored by the Keck School of Medicine at the University of Southern California, and held May 15-16, 2014, in Pasadena, CA. Information about CME activities from this sponsor can be found at www.keck.usc.edu. The Audio Digest Foundation thanks the speakers and the sponsors for their cooperation in the production of this program.

Suggested Reading

COLONIC PROBLEMS

To test online, go to www.audiodigest.org and sign in to online services.
To submit a test form by mail or fax, complete Pretest section before listening and Posttest section after listening.

1. Colonic volvulus accounts for approximately _______ of cases of colonic obstruction in the United States.
   (A) 2% to 4% (C) 20% to 30%
   (B) 10% to 15% (D) 40% to 50%

2. An 80-yr-old man living in a nursing facility presents with abdominal pain and distension. He reports taking laxatives for chronic constipation but has not had a bowel movement for 5 days. Which of the following diagnoses is most likely?
   (A) Cecal volvulus (C) Compound volvulus
   (B) Sigmoid volvulus (D) Splenic flexure

3. In a patient with sigmoid volvulus who requires emergency surgery, which of the following is generally avoided?
   (A) Endoscopic detorsion (C) Anastomosis
   (B) Colonoscopy (D) Insertion of a rectal tube

4. Which treatment for cecal volvulus tends to have the best overall outcomes?
   (A) Cecoplexy (B) Cecostomy (C) Colectomy ** (D) Endoscopic detorsion

5. Which of the following statements about the diagnosis of pneumatosis intestinalis (PI) is true?
   (A) Most cases are evident on plain radiographic films
   (B) Increasingly found on CT obtained for other conditions **
   (C) In most cases, PI is the primary pathologic condition
   (D) Usually diagnosable on the basis of symptoms alone

6. According to recent research on the management of PI, which of the following is significantly associated with increased mortality?
   (A) Location of PI in the gastrointestinal tract (C) Nonoperative treatment
   (B) Portal venous gas (D) Intestinal ischemia

7. A(n) _______ intussusception is most likely to be benign, whereas _______ is more likely to be malignant.
   (A) Enteroenteric; ileocolic or colocolic **
   (B) Ileocolic or colocolic; enteroenteric

8. Which of the following diagnostic methods is most effective for identifying intussusception?
   (A) Plain abdominal films (C) Computed tomography
   (B) Ultrasonography (D) Barium enema

9. Which of the following conditions is being found with increasing frequency in patients with a history of Roux-en-Y gastric bypass surgery?
   (A) Cecal volvulus (B) PI (C) Intussusception (D) Diverticulitis

10. Which of the following statements about the current role of laparoscopic washout for diverticulitis is correct?
    (A) It is a recognized treatment option for feculent peritonitis
    (B) It is associated with shorter lengths of intensive care unit and hospital stays, compared with resection
    (C) It should be considered the treatment of choice for purulent peritonitis
    (D) Current data are inadequate to recommend its routine use

Answers to Audio Digest Gastroenterology Volume 28, Issue 20: 1-D, 2-B, 3-A, 4-B, 5-D, 6-D, 7-C, 8-B, 9-C, 10-B