Cecolic Torsion: Classification, Pathogenesis, and Treatment

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ABSTRACT

Cecolic torsion is a class of right colon obstruction. Under this heading, the known and the recently identified variants are unified under 1 classification. An algorithm is utilized to trace the pathogenesis of these variants. Recent data, prevailing definitions, and controversies are discussed and resolved. The significance of specific membranes and the blood supply is clarified. New symptoms, clinical and X-ray diagnoses are elucidated. The recommended treatments are outlined.

Key Words: Cecolic, Torsion, Volvulus, Funicular, Positional Contrast Enema, Cecocolopexy, Ileo-colectomy.

INTRODUCTION

Cecolic torsion is a class of right colon obstruction.1,2 The predilection to torsion is due to cecolic mobility.3–5 It can be facilitated by funicular membranes. The symptomatology is dependent on the type of variant produced by the torsion. X-ray by positional contrast enema is the best method of diagnosis. The surgical treatment depends on the stage and type of presenting variant.1,2

NOMENCLATURE

The term cecolic refers to the cecum and the ascending colon. Torsion is the twisting of the bowel, which may produce the obstruction and strangulation of the involved loop of bowel.1,2 Cecal bascule is the folding of the mobile cecum upon itself.6,7 An angulation with varying degrees of obstruction is present at the site of the fold. The preferred terminology is “acute” or “chronic recurrent cecal torsion.”2 Floppy or mobile cecum syndrome is poorly understood, and its legitimacy continues to be debated. It has been discredited by some authorities and cited by others.3,7,8 Absence of fixation confers mobility to the cecocolon; however, mobility does not guarantee torsion.1,2 If symptoms from recurring torsion occur, the preferred term is “recurrent cecocolic torsion” (RCT) rather than the anatomically inaccurate and the pathologically inconsistent term floppy or mobile cecum syndrome.1,2 Typhlitis is believed to be an active hyperemia and edema of the cecocolon after a sudden release from torsion. An acceptable synonym is nonspecific cecitis.1 Cecal volvulus is a historical misnomer1,2,9 that is best archived. This specious terminology leads to late diagnosis and treatment with provable high morbidity and mortality rates.6,9–12

PATHOGENESIS

Torsion of the right colon by chronology may be acute or chronic and recurrent. The latter may proceed into an acute episode or vice versa. By severity, torsion may be a partial or a complete obstruction with or without strangu-
lation. Upon these variables depends the development of variants with their specific symptoms. The prevailing concept is simplistic and infers that torsion of the bowel eventuates into a knot or volvulus. This is a deductive fallacy because it fails to account for the variable effects that the modifying nuances of the chronology and severity of torsion impose on the bowel.

The predisposition to torsion is cecocolic mobility. During the second stage of colon differentiation, normal anatomical rotation of 270 degrees occurs and ends at the eighth month of intrauterine life. Colon fixation occurs during the third stage, which ends at 4 months postpartum. A normal rotation with deficient fixation or an elongation from overrotation of the cecocolon results in cecocolic mobility.

Contributory factors to the torsion are Jackson’s membrane at the level of the cecum and the parietocolic band at the level of the ascending colon. When they are funicular, they can act like a fulcrum to propitiate torsion. Adhesions have been mentioned as a cause, but it is believed that the aforementioned 2 structures have been mistaken for adhesions.

It is difficult to produce cecocolic strangulation because of the profuse Anastomoses of the segmental blood supply. These Anastomoses consist of the right colic, ileocolic, anterior cecal, posterior cecal, and appendicular arteries and veins that Anastomose with the ileal vessels and to each other via the marginal vessels. Any transverse torsion or kink can produce a strangulating effect but with difficulty. Only a very prolonged torsion or an ileo-cecocolic volvulus can accomplish this effect.

**CLASSIFICATION**

Cecal torsion (bascula): An acute or chronic recurrent and complete or partial obstruction of a mobile cecum that may fold anteriorly or posteriorly (Figure 1).

Acute cecocolic torsion (cecal volvulus): An acute cecocolic torsion that may develop “de novo” or from a recurrent cecocolic torsion (RCT) (Figure 2).

Recurrent cecocolic torsion (floppy/mobile cecum syndrome): Recurrent torsions with spontaneous resolutions of the mobile cecocolon (Figure 3).

Cecocolic pseudocyst (phantom tumor): The cystic configuration of a cecocolic torsion having spontaneous presentations and resolutions (Figure 4).

Cecocolic pseudo-obstruction and dilation (phantom tumor): A dilated cecocolon with partial obstruction followed by a normal colonic segment (Figure 5).

Cecocolic pseudotumor (phantom tumor): A cecocolon with mural hypertrophy from years of alternating obstruction and spontaneous resolution (Figure 6).

Typhlitis (cecitis, nonspecific cecitis): Acute reactive hyperemia and edema due to a recent detorsion of the cecum or cecocolon (Figure 7).

**INCIDENCE**

It is estimated that mobile cecocolon is present in 20% to 31% of the general population. About 1 in 8000 of those with mobile cecocolon or about 1 in 24,000 per year of the general population develop symptoms. By comparison, appendicitis is about 8 times more common than...
symptomatic cecocolic torsion\textsuperscript{1-2} and averages about 1 per 1000 of the general population per year.\textsuperscript{18} Cecocolic torsion may start to become symptomatic during early childhood, but more commonly it starts to do so from the teenage years and persists throughout the lifetime of the patient.

**SYMPTOMS**

Acute cecocolic torsion (ACT), regardless of variant, presents with classical symptoms of bowel obstruction. It is associated with pain or discomfort at the right lower abdominal quadrant (RAP). Acute cecal bascule presents with symptoms of pain without bowel distension from obstruction because the cecum is a blind pouch. Theoretically, it can dilate independently from intravasation into its lumen and from gas-forming organisms.

The common presentation is the patient with RCT (Figure 3). Patients complain of recurrent discomfort or RAP beginning in their early teen age years or occasionally even much earlier. The author’s youngest patient was a 16-month-old child who was detorsed with water soluble contrast enema (Figures 8 and 9). A spontaneously recurring palpable mass, like a “phantom tumor” is seen with some variants. Constipation may occur when the mass is present and a sudden diarrhea after the mass spontaneously detorses. Nausea and vomiting suggest mesenteric reflex that becomes persistent with the development of a consistent torsion, obstruction, and strangulation.

Right-sided “thrust dyspareunia” may be an additional complaint of symptomatic women who have elongated and overrotated cecocolon occasionally located in the true

**Figure 3.** Recurrent cecocolic torsion. Note clips at the appendicular base from a negative appendectomy 20 years previously.

**Figure 4.** Cecocolic pseudo-obstruction and dilation. Normal communication still present between the dilated cecocolon and the normal ascending colon.

**Figure 5.** Cecocolic pseudocyst. Resolved after detorsion and cecocolopexy.
pelvis adjacent to the pelvic organs in general and the vagina in particular\textsuperscript{1,2,15} (Figure 10). This may be sporadic or persistently disabling and can occur whether the patient is supine or sitting while performing her sexual function.

Many patients contrive maneuvers to relieve their pain. These vary from straining, Valsalva maneuver, straining while squatting and "doubling over," brisk walking, and jogging to name a few. Some patients have consulted psychiatrists, have had multiple consultations, a negative appendectomy, or pelvic laparoscopy. Some have been diagnosed as having chronic appendicitis, irritable bowel syndrome, intestinal allergy, partial obstruction, pseudo-obstruction, or are simply undiagnosed.\textsuperscript{1,2,15,19,20}

A patient with acute RAP that persists beyond 24 hours, who still has localized tenderness without spreading peritoneal signs, is suspect for cecocolic torsion (Figure 11). This can be verified with water-soluble contrast enema that is not contraindicated during an acute presentation. Bowel sound is present and an evanescent mass may be palpable or have overt eccentrically located cecocolic dilation. Blood stained or red currant jelly stools may be reported\textsuperscript{1,2,19,20} (Figures 8 and 9).

No chemical laboratory examination is available that is diagnosis specific. It may suggest an early or late appraisal of the issue at hand. An elevation of the white blood cell count may reflect the severity or late chronology of the diagnosis. The chemistry that discloses electrolyte deficits could signify a late stage.
This is the most reliable method to confirm the diagnosis of cecocolic torsion. In a patient with acute or recurrent RAP, a plain film of the abdomen may show a collapsed or dilated cecum that is errant from the right iliac fossa. Positional contrast enema, preferably water soluble, may disclose the mobile cecocolon in active torsion. It is not contraindicated during an acute presentation. The radiologist performing the enema must remember that the patient may be detorsed during instillation of the contrast and may experience dramatic relief from their symptoms (Figure 8 and 9). The CT scan may disclose the cystic configuration of a cecocolic torsion; however, this is difficult to duplicate even with a known diagnosis of RCT. The CT scan does not assure a more definitive diagnosis than the positional contrast enema. It may be useful to disclose a normal appendix associated with the paracolic “inflammatory-like” reaction in typhlitis (Figure 11).

**Figure 8.** A successful cecocolic detorsion with water-soluble contrast enema.

**Figure 9.** Follow-up film of Figure 8.

**Figure 10.** Overrotated and elongated cecocolon with the mobile cecocolon located in the true pelvis or flexed. The patient had recurrent cecocolic torsion and dyspareunia.

**Figure 11.** Computed tomographic scan of a recently detorsed cecum surrounded by “inflammatory-like” reaction and an air bubble filled normal appendix.

**DIAGNOSIS**

The diagnosis of cecocolic torsion depends on awareness by the clinician. Waiting for the development of a cecal volvulus will lead to late diagnosis and treatment of a cecocolon in torsion. This has a provable high morbidity and mortality rate. The history of recurrent abdominal pain with a recent episode of localized RAP beyond 15 hours after its onset and still not having spreading peritoneal signs suggests this diagnosis. The CT scan may verify a normal appendix and pericecocolic “inflammatory-like” findings (Figure 11). A plain film of the abdomen and if necessary a positional contrast enema can confirm the cecocolic mobility. Patients with very chronic RCT who have a hypertrophied cecocolic wall are the exception to the caveat that a cecum that is dilated beyond 12 cm is prone to perforate (Figures 5, 6 and 12).
DISCUSSION

That a torsion can only become a cecal volvulus needs to be clarified beyond mere empirical observation because it is an anatomical impossibility, a misnomer, and a conceptual illusion. This concept has been reinforced by the inaccurate schematic drawings in publications depicting cecal volvulus, but an actual photograph on the following page of one of the texts shows a cecocolic torsion with a normal ileum. An acute cecocolic torsion that was viable after decompression is testamentary.

Theoretically an ileo-cecocolic volvulus is possible if the cecocolon is overrotated and elongated and together with the ileum torses completely. Any transverse kink or torsion to the right colon will take time to impede the blood supply proximal and distal to the torsion, and for this reason strangulation is difficult to effect on the right colon.

It is a matter of speculation as to the frequency of cecocolic torsion that is mistaken for appendicitis, irritable bowel syndrome, and Ogilvie’s pseudo-obstruction. This includes those detorsed by contrast enema after being mistaken for intussusception, because the patient presented with the supposedly pathognomonic red currant jelly stools.

TREATMENT

The preferred treatment for cecocolic torsion is outpatient laparoscopic cecocolopexy. A minimum of 3 interrupted nonabsorbable sutures should anchor the tinea libera to the parietal peritoneal wall at the right iliac fossa in association with an indicated appendectomy.

Indications for ileocolectomy of the cecocolon are (1) too flimsy and thin walled for suturing; (2) obvious irreversible strangulation; (3) questionable viability; (4) elongated, overrotated, and heavy cecocolon that may tear loose; (5) pseudotumor that is heavy, dilated, hypertrophied, and decompensated.

Jackson’s membrane and parietocolic band should be resected as well as adhesions that may act as a fulcrum to the torsion. If it is technically feasible, this could also be accomplished during other operations by safely using bipolar electrosurgical resection (Everest and Plasma Kinetic Cutting Forceps, Gyrus Medical, Osseo, MN) or by avulsion from the parietal wall, eg, during laparoscopic cholecystectomy.

The surgeon who performs a negative laparotomy or laparoscopy for RAP should ascertain the presence of a mobile cecocolon. If it is present, the operator should perform an indicated cecocolopexy and incidental appendectomy together with resection of Jackson’s membrane or parietocolic band. It is advisable to carry out bowel preparation for elective coeliotomy or laparoscopy for a like indication including preparations for gynecological exploration for right-sided pelvic pain and thrust dyspareunia.

Detorsion by contrast enema or by insufflation can be accomplished, but this does not rectify the pathology. A more definitive procedure should be performed. The author has no experience with detorsion by insufflation. The other surgical procedures recommended and mentioned in the literature are cecostomy, cecocolopexy, combination of cecostomy and cecocolopexy, cecopexy with peritoneal flap, and use of a mesh.

CONCLUSION

Cecocolic torsion is a class of right colon obstruction that involves the cecum or the cecum and ascending colon. It has...
a variable chronology and severity and because it does not always terminate into an acute obstruction, it can result in the formation of several chronic variants with distinct clinical characteristics. The pathogenesis of these variants is traced with an algorithm (Figure 13) that strictly adheres to anatomical and pathological criteria and permits an orderly and logical classification of cecocolic torsion.

Diagnosis of cecocolic torsion in all its forms depends on the awareness of the clinician. Acute cecocolic torsion has a high morbidity and mortality rate, but it can be averted by an awareness, recognition, and treatment of the symptomatic chronic and recurrent forms.

An abdominal x-ray showing the cecocolon located away from the right iliac fossa verifies the cecocolic mobility of a symptomatic torsion. Positional contrast enema is the most reliable examination to confirm the diagnosis of recurrent cecocolic torsion.

During the performance of another operation, an indicated resection of the parietocolic band and Jackson’s membrane, in the presence of a mobile cecocolon, is recommended. The preferred treatment is elective outpatient laparoscopic cecocolopexy. Bowel resection is reserved for specific indications.

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