

# A Case Report: Transverse Colon Volvulus Associated With Chilaiditis Syndrome

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## Abstract

Volvulus of the transverse colon is a rare cause of intestinal obstruction. To our knowledge, only 75 cases have been reported in the English literature to date. No recent reviews of transverse colon volvulus in adult patients have been published in the surgical literature since 1983. Additionally, only two cases of transverse colon volvulus associated with Chilaiditi's syndrome have been reported. We report a case of transverse colon volvulus which was indeed associated with Chilaiditi's syndrome and review the literature.

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## CASE REPORT

The patient was a 75-year-old white female who initially presented to her family physician with the complaint of abdominal discomfort, bloating, and dry heaves. The patient did have a long history of similar symptoms, which had always spontaneously resolved. She also admitted to a history of constipation. Abdominal radiographs were obtained which showed evidence of a large bowel obstruction in association with Chilaiditi's sign (Figures 1 and 2). The patient was then sent to the emergency department for further evaluation.

## Figure 1

Figure 1. Initial abdominal radiograph showing immensely dilated large bowel



### Figure 2

Figure 2. Chest radiograph from abdominal series revealing Chilaiditi's sign: air-filled transverse colon lying anterior to the liver, imitating the appearance of free air under the diaphragm



Abdominal examination revealed a soft, slightly distended, and non-tender abdomen with few bowel sounds. Her stool was guaiac positive. White blood cell count was 10,000 with 10 bands and hemoglobin was 16.2. A gastrografen enema was performed which showed colonic distention and retained fecal material. No definite obstruction was identified upon initial review of the radiographs. The patient was admitted for close observation and support.

The following day the patient's abdominal distention and pain increased. Colonic decompression was attempted, resulting in release of gas and some liquid stool. Later that evening the patient's pain worsened, white blood cell count jumped to 15,000 with 47 bands and her abdomen became markedly distended. The patient was taken immediately to surgery for treatment of suspected colonic ischemia secondary to chronic distention and dilatation.

Upon laparotomy a volvulus of the transverse colon was discovered which had caused ischemic necrosis of the transverse colon. The area of ischemia was limited to the transverse colon, however the ascending colon was markedly distended and highly mobile. For this reason, an extended right hemicolectomy with end ileostomy and mucous fistula was performed.

### DISCUSSION

Colonic volvulus is a well recognized cause of intestinal obstruction. Approximately 3% to 5% of all cases of intestinal obstruction are caused by colonic volvulus (1,2,3,4). Of all areas of colonic volvulus, only 4% involve the

transverse colon (2,3,4). Volvulus of the transverse colon most often occurs in the second and third decades of life with an additional peak in the seventh decade (2,4,5) and women outnumber men 2:1 (2,3,6,7,8). The mortality rate of transverse colon volvulus is 33%, whereas sigmoid volvulus carries a mortality rate of 21% and cecal volvulus a rate of 10% (3).

Chilaiditi's sign (figure 2) is the description applied to the radiographic finding of the colon, typically the hepatic flexure, interposed between the liver and diaphragm, falsely imitating pneumoperitoneum (5,9). Chilaiditi's sign is usually an incidental finding and most of these patients lack any clinical symptomatology (5). However, Chilaiditi's syndrome describes radiological evidence of Chilaiditi's sign in addition to the symptoms of abdominal pain, nausea, vomiting, abdominal distention, and constipation (5,9). Common etiologies for both Chilaiditi's sign and Chilaiditi's syndrome include: increased colonic mobility or redundancy; congenital malrotation or malposition of the colon; elevation of the right hemi diaphragm; enlargement of the thoracic cage diameter; and the "floating liver" found in ascites (5). This is the third case of Chilaiditi's syndrome caused by transverse colon volvulus reported in the English literature.

Transverse colon volvulus has been reported to occur in higher incidence in Eastern Europe and Scandinavia (2,10,11). This increased incidence is likely due to the high residue diets common to these areas (2,3,10).

Volvulus of the transverse colon is a closed loop obstruction. The normal anatomy of the transverse colon typically prohibits volvulus in this area. The short transverse mesocolon and the hepatic and splenic flexures act to fix the transverse colon in position. The etiologies of transverse colon volvulus may be grouped as mechanical, physiological, and congenital (2,3,4,12). Mechanical causes include: previous volvulus of the transverse or sigmoid colons, distal colonic obstruction, adhesions, malposition of the colon following previous surgery, mobility of the right colon, inflammatory strictures, and carcinoma (1,2,3,4,5,12). The most common physiological condition which predisposes to volvulus is chronic constipation (3,4,11,12). Chronic constipation lends to elongation and redundancy of the colon, permitting volvulus even in the presence of a normal mesentery. Yaseen et al report a case of transverse colon volvulus associated with *Clostridium difficile* pseudomembranous colitis. Yaseen postulated that the acute

inflammation of the mucosa might have permitted the formation of the volvulus (3). Errors in congenital rotation of the midgut, which result in abnormal fixation of the mesentery, may also play a significant role in permitting volvulus to occur (3,4,12).

Two separate clinical presentations have been described in the literature: acute fulminating and subacute progressive (2,3,7,11,12). Patients with the acute fulminating type of presentation typically have a sudden onset of severe abdominal pain, rebound, vomiting, little distention, and rapid clinical deterioration. Bowel sounds are initially hyperactive but may later become absent (2,4,7,11,12). Laboratory studies may reveal a marked leukocytosis in the acute form, perhaps representing ischemia and gangrene (4,7). As many as 50% of patients with the subacute form of transverse colon volvulus report to have had similar symptoms in the past (2,4,7,12), as our patient exhibited. The patient with the subacute form experiences a more gradual and intermittent onset of symptoms. Abdominal pain is less severe and vomiting is less or often absent. Rebound is absent, however distention is often more prominent (2,4,7,12).

The diagnosis of transverse colon volvulus is not commonly made preoperatively (2,8). Plain abdominal radiographs typically reveal colonic distention which may mimic cecal or sigmoid volvulus (6,7). The classic plain film description of transverse colon volvulus is a dilated loop of bowel in the upper abdomen with two air fluid levels present (2,3,4,6,12). The dilated loop may appear as a “bent inner tube with a summation line along the inner margin of the loop” (2). The classic “birds beak” deformity in the area of the transverse colon seen on contrast enema is diagnostic (figure 3). However in the acute situation, surgery should not be delayed to perform the contrast study. Additionally, a water-soluble contrast medium should be used to minimize the consequences should perforation occur.

**Figure 3**

Figure 3. Gastrografin enema radiograph showing the classic “bird’s beak” of colonic volvulus. Note that upon initial evaluation of the radiographs, no definite obstruction was identified. Careful post-operative review of the gastrografin radiographs revealed the classic sign



Whereas sigmoid volvulus can often be decompressed by sigmoidoscopy or colonoscopy, transverse colon volvulus must be surgically detorsed (6,7,8,11,12). Surgical options include: detorsion alone, detorsion with colopexy, resection with primary anastomosis, or resection with colostomy or ileostomy and mucous fistula. Both detorsion and detorsion with colopexy have a higher rate of recurrence than resection (1,3,4,6,7). Of course, resection is indicated if there is any evidence of ischemic or necrotic bowel. Resection with or without primary anastomosis is the treatment of choice for transverse colon volvulus to prevent recurrence (1,4,6,7). In the event of bowel necrosis, resection with end colostomy or ileostomy and mucous fistula is the surgical procedure of choice due to risk of anastomotic leakage (6), as in the case presented.

Although transverse colon volvulus is rare, the patients appear to follow a particular clinical pattern that may be of

significance in the diagnostic phase. Chilaiditi's syndrome does not appear to be significant in diagnosing transverse colon volvulus but rather occurs as an occasional side effect. Due to the limited number of cases reported, it would be difficult to make any broad statements concerning the relationship between transverse colon volvulus and Chilaiditi's syndrome, but this may prove to be an area for further research.

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