

## Case Report

# Organoaxial volvulus of descending colon: a case report

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### ABSTRACT

“Colonic volvulus” refers to the twisting of colon, which most commonly involves sigmoid colon causing obstruction, ischemia and gangrene. But very rarely segment of descending colon can be involved. This is a case of 42 year old male with vomiting, abdomen pain and distension since one day, showing organoaxial volvulus of descending colon loop with a twist of mesentery.

**Keywords:** Colonic obstruction, Descending colon, Mesenteric twist, Persistent mesocolon, Volvulus, Whirled configuration

## INTRODUCTION

Colon volvulus represents the third most common cause of colonic obstruction after carcinoma and diverticulitis. This is caused by a twisting of the intestine on its mesenteric axis, that results in complete or partial obstruction. It reduces spontaneously or recurs chronically, but the colon volvulus presents acutely. When there is a compromise of blood supply, necrosis and perforation supervenes.<sup>1</sup>

Although obstruction of large bowel is less common than that of small bowel, the former is associated with increased rate of morbidity and mortality due to delay in diagnosis or treatment. In majority of patients with large bowel obstruction, Plain radiographs are sufficient for diagnosis. But for identifying the site, severity and etiology of obstruction, role of MDCT has become mandatory.<sup>2</sup>

The large bowel obstruction presents with specific symptoms in patients. Obstruction of the left colon manifests earlier than that caused by obstruction in the right colon as the lumen of both the sigmoid and descending colon is smaller and the stool is more inspissated in the distal colon.<sup>3</sup>

## CASE REPORT

A 42 year old male came to casualty with complaints of vomiting, severe abdominal pain and distension since one day. On physical examination - Abdomen was distended with guarding and rigidity. Tympanic resonance noted on percussion. His vitals were stable and afebrile. Patient gave a history of appendectomy 25 years back. The findings of routine laboratory tests were normal.

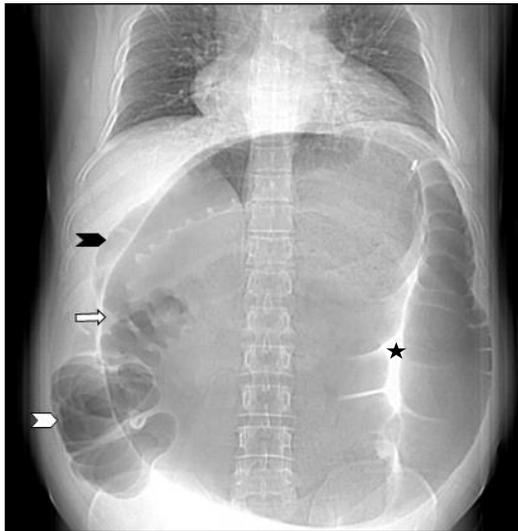
Patient was advised to do Erect abdominal radiograph (Figure 1), which showed significantly dilated large bowel loop (descending colon) with diameter of ~ 21 cm, occupying mid and left side of abdomen. Rectal gas shadow was absent. No evidence of pneumoperitoneum.

Further, as next line of investigation, CECT Abdomen (Figure 2, 3) was done which showed dilated descending colon loop with two tapering limbs coursing inferiorly with a whirled configuration of the twisted mesentery in the left colonic compartment. Afferent and efferent loops of the descending colon formed the caudal aspect of the whirled configuration. Distal to this whirled configuration, all bowel loops i.e sigmoid colon and rectum are collapsed. Transverse colon and ascending colon were within normal diameter and small bowel

loops are collapsed. All bowel loops showed good contrast enhancement and no signs of bowel strangulation or perforation seen. These findings were interpreted as descending colon volvulus with persistent long descending mesocolon.



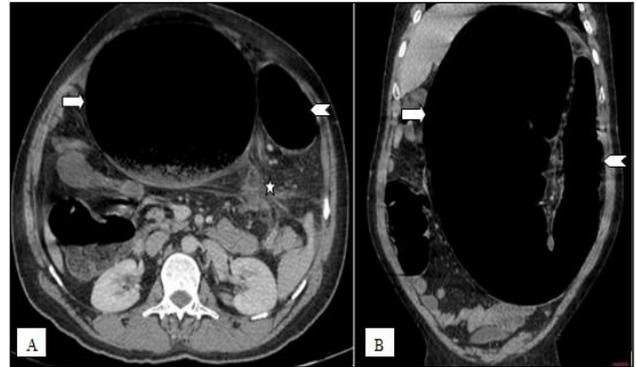
**Figure 1: Erect abdominal radiograph of descending colon volvulus showing significantly dilated descending colon (white arrow) with diameter of ~ 21 cm, occupying mid and left side of abdomen.**



**Figure 2: CT Topogram of descending colon volvulus. Topogram shows air-filled dilated descending colon occupying mid and left side of the abdomen (white arrow) with mesentery (star) facing downwards. Ascending colon (white arrow head) and transverse colon (black arrow head) were within normal diameter limits.**

At surgery, authors found twisted mesentery and descending colon that resulted in volvulus. The descending colon was redundant and had a persistent, long mesocolon. No bowel necrosis or perforation was found. Rest of the bowel loops were unremarkable. Derotation and mesenteric fixation were performed. The

patient had an uneventful course after surgery and was discharged from the hospital after 14 days.



**Figure 3: CECT Abdomen axial (A) and Coronal reformatted (B) of descending colon volvulus shows a markedly dilated descending colon with afferent (white arrow head) and efferent limbs (white arrow) that appears tapered and coursed inferiorly inferiorly with a whirled configuration of the twisted mesentery (star) in the left colonic compartment.**

## DISCUSSION

Volvulus occurs in portions of the colon which has a mesentery, including the sigmoid, cecum, and transverse colon. Rarely, volvulus develops in the splenic flexure.<sup>4</sup> This is because of congenital absence or surgical division of the normal fixation structures, like the gastrocolic, phrenicocolic, and splenicocolic ligaments. The peritoneum covers the descending colon on three sides and it is a retroperitoneal structure without a mesocolon. There may be failure of fusion of the primitive dorsal mesocolon with the parietal peritoneum in the fourth and fifth month of gestation, resulting in a persistent descending mesocolon<sup>5</sup>. This leads to mobility of the descending colon, resulting in considerable variation in its position. Commonly, the descending colon swings to the midline or slightly to the left of the midline<sup>6</sup>, from where it creates a space for a part of the small bowel to migrate. Superadded to this, chronic constipation leads to markedly redundant, dilated colon that is often associated with an elongated mesocolon.

Volvulus can be of two types 1) Organoaxial and 2) Mesenteroaxial. Organoaxial is twisting along its long axis and mesenteroaxial is twisting along its short axis.<sup>7</sup> Due to persistence of the suspending dorsal mesentery and chronic constipation, this patient had a long, redundant segment of descending colon; associated with large mesocolon; including approximation of two ends of the loop. This configuration allowed twisting of descending colon along its long axis causing organoaxial volvulus and resulting in a closed-loop obstruction.

The diagnosis of colonic volvulus can be diagnosed on conventional abdominal radiography and can be confirmed with a barium enema. But barium enema

offers no information about complications such as bowel ischemia.

A specific CT sign for volvulus is the whirl sign which was originally described in the midgut by Fisher.<sup>8</sup> This sign was found to be helpful in diagnosing sigmoid and cecal volvulus.<sup>9,10</sup>

The whirl is composed of tightly twisted bowel, mesentery, and vessels. The tightness of the whirl is proportional to the degree of rotation. CT findings of strangulation include circumferential thickening of bowel wall, intestinal pneumatosis, mesenteric congestive haziness, and mesenteric hemorrhagic fluid.<sup>11</sup>

In this patient, the distended bowel loop depicted on radiography was suggestive of volvulus, but the exact level of obstruction was hard to identify. The whirl sign in the left colonic compartment was diagnostic for volvulus, and the afferent and efferent loops were identified by the level of the obstruction and the mesentery was facing downwards (as opposed to sigmoid volvulus, where mesentery will be facing upwards) to diagnose it as descending colon volvulus. The findings were correlated intraoperatively.

## CONCLUSION

Volvulus of the descending colon may occur when a persistent mesocolon is present. Chronic constipation may lead to dilatation of the colon and is a predisposing factor for volvulus. The location of the whirl sign, associated bowel dilatation, and the origin of the afferent and efferent loops with mesentery facing downwards direction on CT accurately determine the cause and level of obstruction.

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