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Case Report of Transverse Colon Volvulus with Classic Radiological Findings

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Abstract | **Case Report**

Transverse colon volvulus (TCV) is a rare but serious cause of large bowel obstruction, and its diagnosis relies heavily on imaging. While plain radiographs can suggest the diagnosis, contrast-enhanced computed tomography (CT) is the gold standard for confirming TCV and assessing complications such as ischemia and perforation. We present a case of TCV in a 27-year-old male presenting with acute abdominal pain, vomiting, and abdominal distension. Imaging revealed the characteristic "coffee bean" sign and "whirl sign" of the transverse colon on CT, confirming the diagnosis. Given the absence of imaging features suggesting complications, the prognosis was improved, allowing for a non-emergency approach to surgical management. The patient subsequently underwent a subtotal colectomy due to the significant dilation of the colon, in order to prevent potential recurrence. This case underscores the crucial role of imaging, particularly CT, in diagnosing TCV.

Keywords: Transverse colon volvulus (TCV), Large bowel obstruction, Computed tomography (CT), Coffee bean sign, Whirl sign.

INTRODUCTION

Volvulus is a type of bowel obstruction caused by the twisting of a segment of the intestine, which impairs blood supply and can lead to ischemia [1]. Although colonic volvulus accounts for 3-5% of all cases of intestinal obstruction, the transverse colon volvulus (TCV) is a relatively rare occurrence, representing only 2-4% of all colonic volvulus cases [2]. Fewer than 100 cases of transverse colon volvulus have been reported in the literature [3]. TCV is associated with a high risk of mortality, as delays in diagnosis can result in severe complications such as bowel necrosis or peritonitis. While CT scan is crucial in diagnosing the condition [4], TCV can sometimes be difficult to detect and may only be identified during surgery [2]. Timely diagnosis and intervention are essential for improving patient outcomes.

CASE REPORT

A 27-year-old male with no significant past surgical or medical history, aside from recurrent episodes of occlusion syndrome treated symptomatically, presented to the emergency department with a new episode of acute abdominal pain. The patient described a 24-hour history of progressive abdominal distension, nausea, vomiting, and mild fever. These symptoms were consistent with an occlusive pattern, leading to concern for a possible bowel obstruction.

On clinical examination, the patient was conscious and hemodynamically stable, with a mild fever of 38.1°C. He presented with generalized abdominal distension, which was relatively tense and tender to palpation, but without signs of peritoneal irritation, such as guarding or rebound tenderness. A rectal examination revealed an empty rectal vault, indicating a lack of distal bowel content. This clinical presentation strongly suggested a colonic obstruction.

Laboratory investigations revealed an elevated white blood cell count of 15,000/µL, along with an elevated C-reactive protein (CRP) of 120 mg/L, indicating an ongoing inflammatory response. Renal function was normal, and there were no electrolyte imbalances.

Given the clinical suspicion of bowel obstruction, a contrast-enhanced abdominal CT scan was performed, it showed a significant distension of the transverse colon, with the left colic flexure and the descending colon forming a double loop at the site of the

volvulus. A “whirpool sign,” indicative of mesenteric twisting, was clearly visible at the level of the left colic flexure (Figures 1 and 2), as well as the typical “coffee bean” appearance of the dilated transverse colon (Figure 3) strongly suggesting a transverse colon volvulus. There were no radiological signs indicating complication such us perforation or bowel necrosis.

In the management of this case, the patient underwent laparotomy, which revealed a twisted transverse colon around its mesenteric axis, with no evidence of ischemia or perforation. Due to dilation of the affected segment, a subtotal colectomy was performed to prevent potential relapse, followed by an ileo-colic anastomosis. The procedure was completed without complications.

These are the images of a contrast CT scan of the abdomen at venous phase:

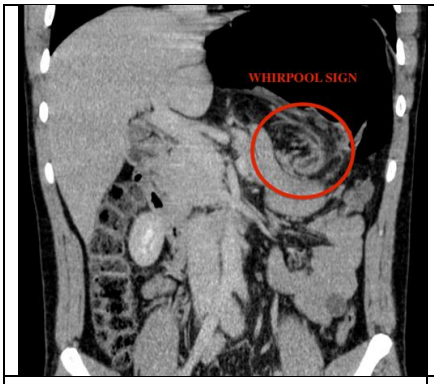

Figure 1: Coronal image demonstrating the typical appearance of a whirpool sign with the swirling appearance of the transverse colon mesentery

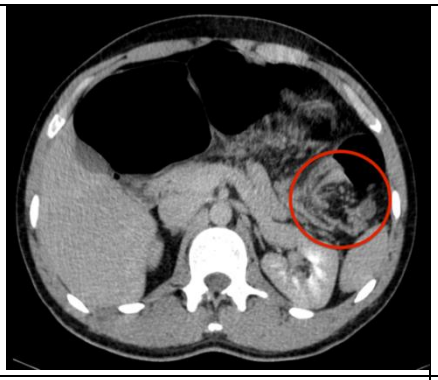

Figure 2: Whirpool sign on axial image

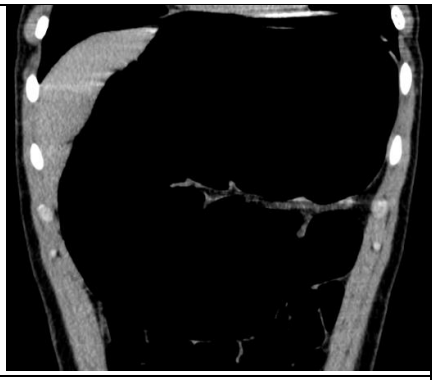

Figure 3: Coronal CT scan image of the abdomen showing distension of the transverse colon, presenting the characteristic "coffee bean" sign

DISCUSSION

The word "volvulus" originates from the Latin verb *volvere*, meaning "to turn." Thus, colonic volvulus refers to the abnormal torsion of a segment of the colon along its vascular axis (mesocolon), leading to vascular compromise, bowel ischemia, and necrosis. In cases of delayed diagnosis, this can progress to colonic perforation and, subsequently, stercoral peritonitis [2, 6].

Colonic volvulus is one of the benign causes of mechanical large bowel obstruction. The majority of volvulus cases occur in the sigmoid colon (60–80%), followed by the cecum (20–40%). Volvulus of the colic flexures and transverse colon is rare, accounting for less than 3% of cases, and literature on these locations is limited. Among these, transverse colon volvulus (TCV) carries the highest mortality rate, reaching 33%. The first case of TCV was described in 1932 by Finnish surgeon Kallio [3, 4, 7].

Volvulus formation is mainly caused by redundancy (excessive slack) and non-fixation of the colon. The sigmoid colon is most susceptible due to its greater mobility, while the transverse colon is less prone due to its shorter mesentery and fixed flexures [2, 3, 4].

Transverse colon volvulus (TCV) can be caused by mechanical, congenital, and physiological factors. Mechanical risks include previous volvulus, adhesions, or malignancies. Congenital factors involve intestinal malrotation or poor fixation of the colon. Physiological factors, particularly chronic constipation, can lead to colon elongation and distension, increasing vulnerability to twisting. Authors have also reported an association between TCV and Chilaiditi syndrome [8]. In our patient, chronic constipation appears to be a key factor, as he had multiple episodes of occlusive syndrome that were repeatedly managed symptomatically.

Transverse colon volvulus typically presents in two forms: sub-acute and acute fulminant. The sub-acute form presents with mild symptoms, such as abdominal distension and mild pain, with no signs of peritoneal irritation. It is more common in elderly patients and can be misdiagnosed, potentially progressing to the fulminant form. The acute fulminant form is marked by sudden severe abdominal pain, signs of bowel necrosis, absent bowel sounds, and an elevated leucocyte count, requiring urgent surgical intervention. Our patient, young and otherwise healthy, presented with a sub-acute form [2, 4, 8].

Transverse colon volvulus (TCV) remains a challenging diagnosis, often not made pre-operatively, and even when suspected, the exact location may be unclear. This is primarily due to the lack of pathognomonic radiographic features, unlike in sigmoid volvulus, where more specific findings are typically present.

In the emergency evaluation of non-traumatic acute abdomen with suspected bowel obstruction, plain

film radiographs are commonly used as the first-line imaging modality. These may reveal distended loops of the colon with two levels of fluid in the epigastrium, suggesting bowel obstruction, though this is not specific to TCV. In subacute cases, an upper abdominal "coffee bean" sign may be observed.

However, given the high mortality associated with TCV compared to sigmoid or cecal volvulus, many authors recommend avoiding imaging in the acute phase and opting directly for surgery. In contrast, early radiological diagnosis is crucial in the subacute presentation, where CT scans are strongly advocated. CT is considered the gold standard for diagnosing volvulus due to its ability to provide detailed and accurate assessments of bowel obstruction and mesenteric involvement.

While TCV lacks characteristic radiological features, certain findings are suggestive of the condition. These include the "whirl sign," where the twisted bowel loop causes mesentery rotation, resulting in a distinctive swirling appearance of mesenteric vessels and fat converging radially toward the torsion site. Additionally, CT may show a U-shaped configuration of the dilated large bowel, filled with air and fluid, and sometimes the classic "bird's beak" appearance of the transverse colon on contrast enema [2-4, 7-11].

The role of CT extends beyond diagnosis, as it is also vital for detecting complications that could significantly alter the therapeutic approach. These include signs of bowel ischemia, such as pneumatosis intestinalis (gas within the bowel wall) or bowel wall thickening, which suggest compromised blood flow and potential necrosis. Free fluid from perforation is another concern.

In our case, TCV was diagnosed pre-operatively using a post-contrast abdominal CT, which revealed the whirl sign, with the mesocolon twisted around the mesocolic vascular pedicle supplying the affected colon segment. The CT also demonstrated colonic distension from the proximal transverse colon to the right flexure, with collapse of the descending colon, without signs of complications. This case highlights the importance of CT scans in diagnosing TCV.

Unlike sigmoid volvulus, conservative treatment with colonoscopic decompression is not recommended for TCV due to the high risk of failure and bowel necrosis. The preferred approach is resection of the affected bowel followed by anastomosis, with the possibility of stroma formation. Detorsion or untwisting, combined with colpexy, should be avoided as they increase the risk of recurrence or mortality. In cases with megacolon, some experts recommend subtotal colectomy over partial resection of the affected bowel segment, as was the case with our patient, who underwent extended hemicolectomy followed by end-to-end ileocolic anastomosis. Per operatively, there were no signs of ischemia or perforation, which matched the imaging findings. The postoperative course was uncomplicated, and the patient was discharged within a week [4, 5, 8, 9].

CONCLUSION

Transverse colon volvulus (TCV) is a rare but serious cause of large bowel obstruction that requires prompt diagnosis and intervention. Contrast-enhanced CT, plays a critical role in diagnosing TCV and assessing associated complications. Surgical management, typically involving resection of the affected bowel, remains the treatment of choice, as conservative approaches carry significant risks. Timely diagnosis and appropriate surgical intervention are crucial to improving patient outcomes and preventing recurrence.

Conflict of Interest: None

REFERENCES

1. Gimeno, N. G., Delgado, A. A., Vicente, F. N., Marqués, A. M., Manuel, J., Sánchez, S., ... & Andrea, M. M. Transverse colon volvulus in a young patient with wandering liver. *Revista espanola de enfermedades digestivas*. Published online February 12, 2024. doi:10.17235/reed.2024.10245/2023
2. Elbakouri, A., Lafkih, O., El Andaloussi, Z. A., Bouali, M., Elhattabi, K., Bensardi, F., & Fadil, A. (2021). Sub-acute transverse colon volvulus an exceptional cause of large bowel obstruction: Case report. *Annals of Medicine and Surgery*, *63*, 102154. doi:10.1016/j.amsu.2021.01.102
3. Transverse colon volvulus in a patient with autism - PubMed. Accessed January 6, 2025. https://pubmed.ncbi.nlm.nih.gov/32934786/
4. Hasnaoui, H., Laytimi, F., Elfellah, Y., Mouaqit, O., Benjelloun, E. B., Ousadden, A., ... & El Bouhaddouti, H. (2019). Transverse colon volvulus presenting as bowel obstruction: a case report. *Journal of medical case reports*, *13*(1), 1-4. doi:10.1186/s13256-019-2080-1
5. Transverse colon volvulus in neurologicaly imparied patient as an emergency surgical condition: A case report - PubMed. Accessed January 6, 2025. https://pubmed.ncbi.nlm.nih.gov/29350896/
6. Mengistu, S., Asnake, M., Hassen, S., & Mekonnen, B. (2023). Synchronous volvulus of ascending and transverse colon. *International Medical Case Reports Journal*, 397-400. doi:10.2147/IMCRJ.S413600
7. Fawaz, A. A., Valentin, V., Antoine, L., Lauranne, P., & Olivier, F. (2022). Transverse colon volvulus. *Surgery Open Science*, *10*, 34-35. doi:10.1016/j.sopen.2022.05.001
8. Abdulla, H. A., Hamza, E., & Dhaif, A. (2019). Transverse colon volvulus in a patient with sickle

cell disease. *BMJ Case Reports CP*, *12*(3), e228863. doi:10.1136/bcr-2018-228863

9. Chia, D. K. A., Chan, D. K. H., & Tan, K. K. (2019). Transverse colon volvulus: a rare cause of intestinal obstruction. *Journal of Gastrointestinal Surgery*, *23*, 1944-1946. doi:10.1007/s11605-019-04289-8
10. Bouali, M., Yaqine, K., Elbakouri, A., Bensardi, F., Elhattabi, K., & Fadil, A. (2021). Ischemic volvulus of the transverse colon caused by intestinal malrotation: A case report. *International Journal of Surgery Case Reports*, *83*, 105971. doi:10.1016/j.ijscr.2021.105971
11. Pinto, A., Pinto, F., Scaglione, M., Grassi, R., & Romano, L. (2001). Transverse Colon Volvulus: appearance on computed tomography. *Emergency Radiology*, *8*, 227-229. doi:10.1007/PL00011908