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Cecal Volvulus: Retrospective Analysis of Ct Evaluation with Pictorial Review of the Salient Features

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ABSTRACT-
Cecal volvulus is a torsion of the cecum around it's own mesentery and can occur in the small percentage (11–25%) of the population, predisposed by developmental failure of peritoneal fixation, allowing the proximal colon to be free and mobile. Second requirement is restriction of the bowel at a fixed point within the abdomen that serves as a fulcrum for rotation, such as an adhesion, abdominal mass, or scarring. Cecal volvulus presents with clinical features of proximal large bowel obstruction. This is usually with colicky abdominal pain, vomiting, and abdominal distension. Signs identified in cecal volvulus include bird beak sign , whirl sign, x-marks-the-spot-sign and split wall sign.
In the present study,80 MDCT Abdomen and pelvis scans acquired in the emergency radiology setting with diagnosis of Cecal volvulus were retrospectively evaluated. Study images were analyzed to document various imaging features of cecal volvulus. The results were analyzed and pictorial presentation compiled.
Key words*-MDCT, Volvulus, Torsion.*

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I. INTRODUCTION-

Cecal volvulus describes torsion of the cecum around its mesentery which often results in obstruction.The clinical symptoms associated with volvulus are often nonspecific and include pain and nausea with vomiting[1]. Prompt diagnosis is critical to avoid life-threatening complications such as bowel ischemia and infarction[2]. Due to its rarity and nonspecific presentation, preoperative diagnosis is rarely achieved in most cases. Abdominal radiographs as an initial diagnostic test are usually abnormal and can detect cecal volvulus in half of cases. Nowadays, computerized tomography is used for more accurate diagnosis and differentiation from other acute emergent conditions[3]

Types of cecal volvulus:

Type 1. Cecum twists in the axial plane, rotating clockwise and counterclockwise in long axis and appearing in the RLQ

Type 2. Loop type, twisting or torsion of a portion of the cecum and a portion of the terminal ileum, cecum gets displaced to an ectopic location (typically left upper quadrant) and is relocated in an inverted orientation, commonly counterclockwise twist.

Type 3. Cecal bascule: cecum folds anteriorly or posteriorly without any torsion, seen as dilated loop in the mid abdomen

II. AIMS AND OBJECTIVES

To evaluate salient imaging features, complications, and unusual findings of Cecal Volvulus on CT abdomen and pelvis images.

III. MATERIALS AND METHODS

80 CT Abdomen and pelvis studies were acquired with diagnosis of Cecal volvulus and were retrospectively evaluated.The findings were picked up using 16slice CT available in the department of Radiodiagnosis, GEMS.Findings assessed included position of cecum, Whirl sign, cecal diameter, beak sign, small bowel obstruction, mesenteric edema, pneumatosis & distal colon decompression.

IV. RESULTS

A total number of 80 cases were included in the study and the data was expressed in number and percentages.

Table 1:

Table1:Distributionofpatientsbasedonage

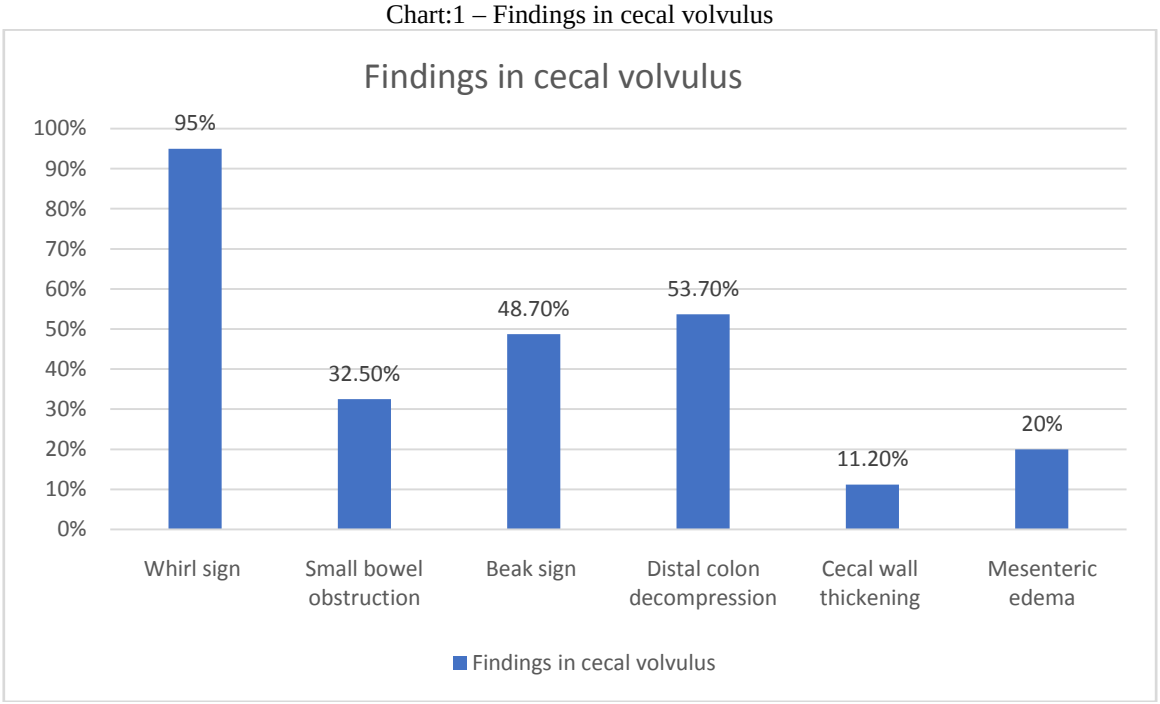
Age(Years)	Number	Percentage(%)
30-50years	11	13.8%
51-70years	49	61.2%
Above71years	20	25%

Table 2:

Distribution of cases based on findings of cecal volvulus

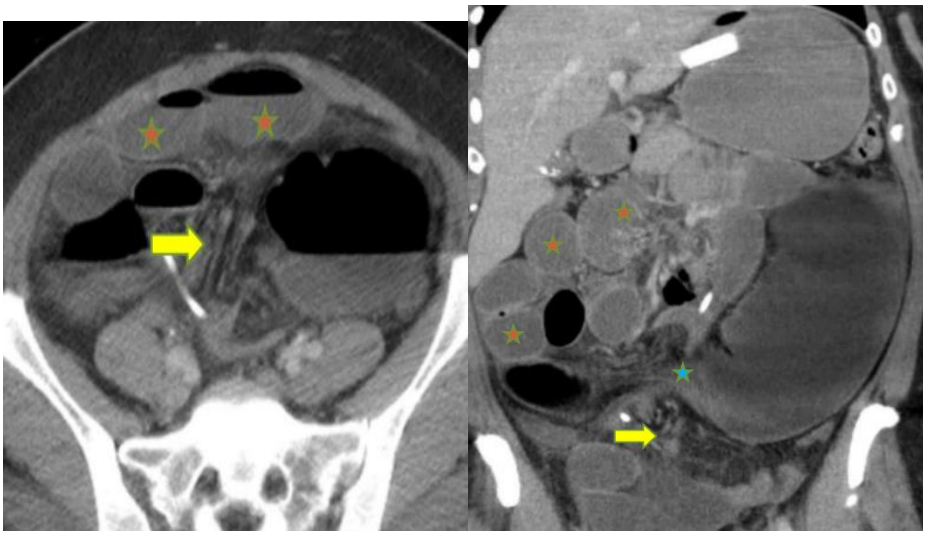
Imaging finding	Number of cases	Percentage
Whirl sign	76	95%
Small bowel obstruction	26	32.5%
Beak sign	39	48.7%
Distal colon decompression	43	53.7%
Cecal wall thickening	9	11.2%
Mesenteric edema	16	20%

Chart:1 – Findings in cecal volvulus



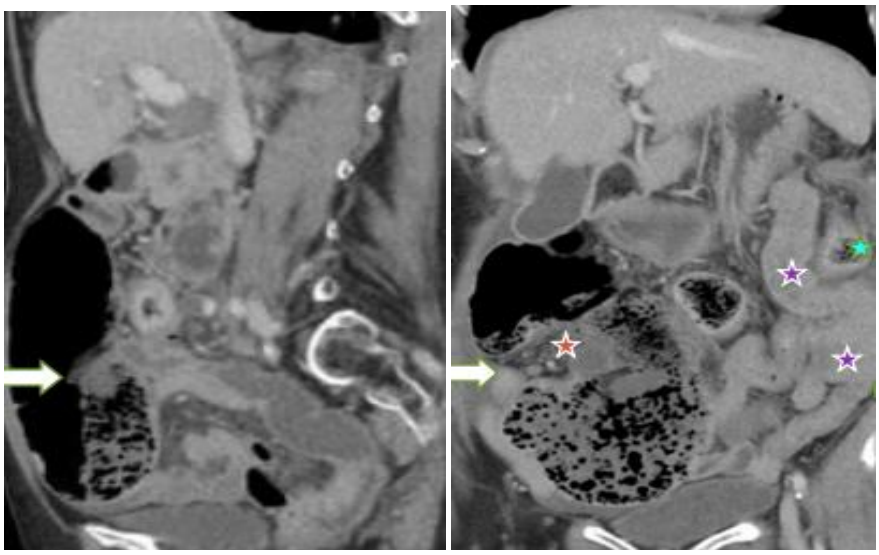
Case1 : A 66 year old male patient with history of abdominal pain, nausea, vomiting, suspected bowel obstruction; Coronal non contrast CT images demonstrate a typical cecal volvulus with its apex in LUQ(*) dilated cecum, mesenteric edema.

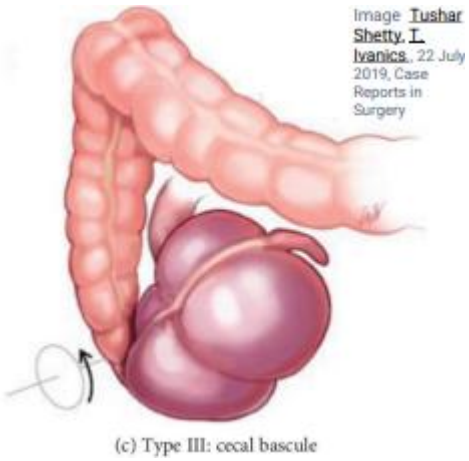
Case2 : 49 year old female patient with history of diffuse abdominal pain and vomiting, axial and coronal CECT demonstrates a cecal volvulus with apex in LUQ, whirl sign (arrow) in the midline lower abdomen, and adjacent beak sign(*). The cecum is dilated, there is associated small bowel dilatation and obstruction(*). There is bowel malrotation indicated by the presence of small bowel loops in the right mid and lower abdomen. Mechanism of volvulus as explained in the inset image (Type 2).



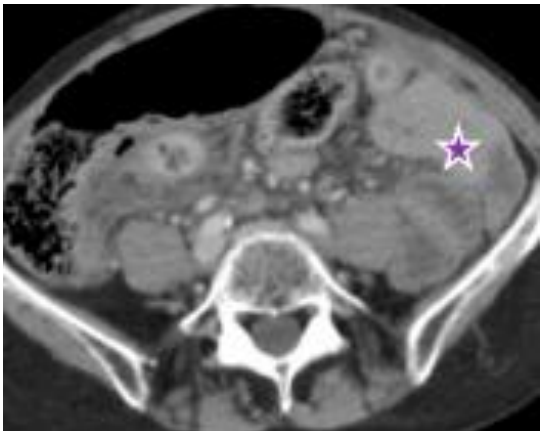
Case3 : 81 year old male patient with history of left lower abdominal pain, CECT abdomen and pelvis demonstrates:

- Cecal Bascule (arrow), posteriorly folded dilated cecum
- Proximal ascending colon and cecal dilatation
- Whirl sign (*) – in the right mid abdomen
- Distal Colon Decompression (*)
- Diffuse mesenteric edema and small free fluid, small bowel wall thickening(*)

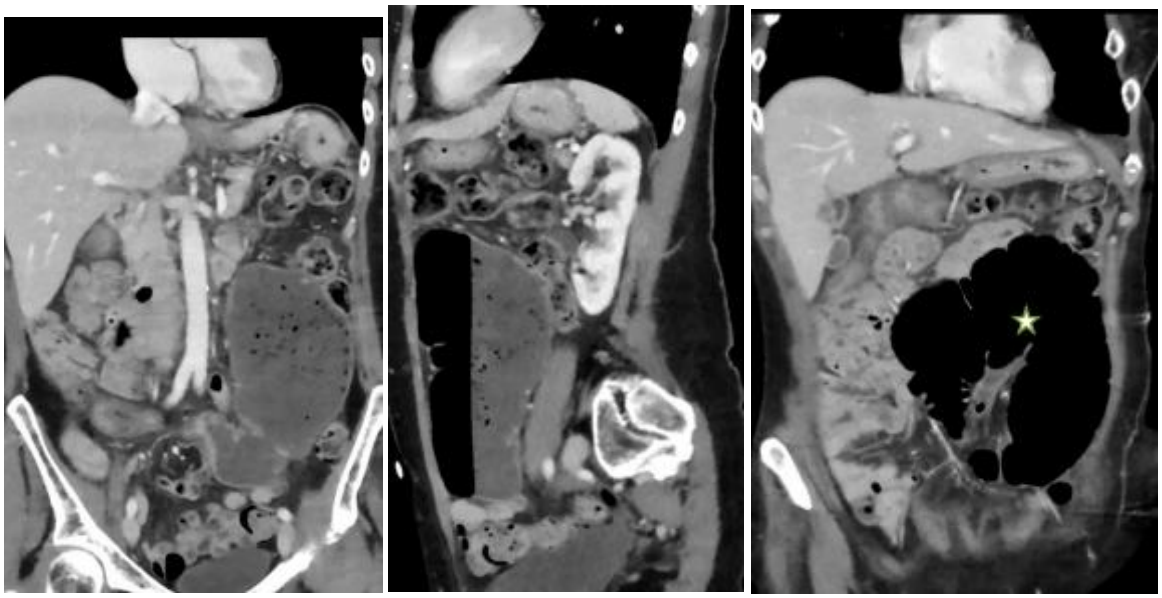




(c) Type III: cecal bascule



Case4: 66 year old female patient with history of Right upper quadrant and flank pain, Contrast CT Abdomen and pelvis demonstrates, Cecal Volvulus, dilated cecum in the left mid abdomen with Whirl Sign at the central mid abdomen, Beak sign adjacent to the site of twist, and a grossly dilated cecum with closed loop obstruction(*).



V. DISCUSSION

Dilated and displaced cecum with Whirl sign were the most common imaging findings seen in 97.5% and 95% of the patients diagnosed with Cecal volvulus[4]. Cecal wall thickening was seen in 11.2% of the studies, associated small bowel obstruction was seen in 32.5% of the studies and a beak sign was demonstrated in 48.7% of the studies.

Each study was assigned a score between 1- 10 based on level of confidence in the diagnosis of cecal volvulus. Studies with classic CT signs were scored 10 and comprised of 65 % of the cases in this series. Ectopic cecal location with identifiable haustral markings was the hallmark for diagnosis of cecal volvulus. Cecal position in the left upper quadrant increases certainty of diagnosis Identifiable mesenteric twist in addition to cecal dilatation and ectopic location was assigned higher certainty **Classic signs :** Whirl sign, beak sign, coffee bean sign increase diagnostic probability

VI. CONCLUSION

This pictorial review demonstrates findings helpful in making the diagnosis of cecal volvulus :

- Different locations of the displaced caecum.
- Incidentally diagnosed uncomplicated cecal volvulus.
- Beak sign and Whirl sign of cecal volvulus
- Complicated cecal volvulus with small bowel obstruction
- Bowel wall thickening, pneumatosis, free air, abscess: indicators of complications including bowel ischemia and sepsis.
- Dilated and displaced cecum in abnormal location was seen in all cases, Whirl sign(95%), Distal colon decompression (53.7%) and Beak sign(48.7%) were the most classic findings of cecal volvulus in this series.

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