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Encapsulating Peritoneal Sclerosis (Eps): A Case Series In Northeast India

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Abstract

Background: Encapsulating peritoneal sclerosis (EPS) is a rare, complicated, non malignant and potentially life threatening condition which is characterized by the formation of a fibrotic capsule around the bowel, leading to mechanical bowel obstruction, malnutrition, and chronic abdominal symptoms. While EPS is most commonly associated with long-term peritoneal dialysis, it can also occur in patients without a history of dialysis or prior abdominal surgery. The pathophysiology of EPS involves chronic peritoneal inflammation and fibrosis, which results in progressive encapsulation and restriction of bowel movement. Early diagnosis and appropriate management are crucial to improve patient outcomes.

Keywords: Encapsulating Peritoneal Sclerosis (EPS), Bowel Encapsulation, Abdominal cocoon, sclerosing peritonitis, Clumped bowel loops

CASE 1

A 42-year-old male presented with abdominal distention, nausea, and weight loss. There was also history of intermittent abdominal pain. No history of previous abdominal surgery or peritoneal dialysis.

On clinical examination, the patient appeared moderately malnourished, with noticeable abdominal distention. His abdomen was firm to palpate with generalized tenderness in the lower quadrants. There were no signs of acute peritonitis but bowel sounds were reduced.

The initial abdominal X-ray revealed a gassless abdomen which indicated a possibility of long standing sub acute bowel obstruction, clumping of bowel or bowel ischaemia [Fig-1,A].

In ultrasonography, the peritoneum appeared diffusely thickened, with a homogenous echogenicity. There was also evidence of moderate dilatation of small bowel loops with minimal peristalsis seen. Moderate amount of anechoic fluids also seen in interbowel areas [Fig-1, B].

On NECT & CECT abdomen there was evidence of diffusely thickened & enhancing peritoneum which were centrally displaced with encapsulated small bowel loops. Also, minimal to moderate amount of fluid attenuated hypodense inter bowel collections was seen in those centrally displaced bowel loops. There was also multiple calcific densities seen in peritoneal reflections [Fig- 1, C/D/E].

On those basis the patient was diagnosed to have encapsulating peritoneal sclerosis. Following this surgical procedure was performed & patient was discharged on D36 of surgical procedure.

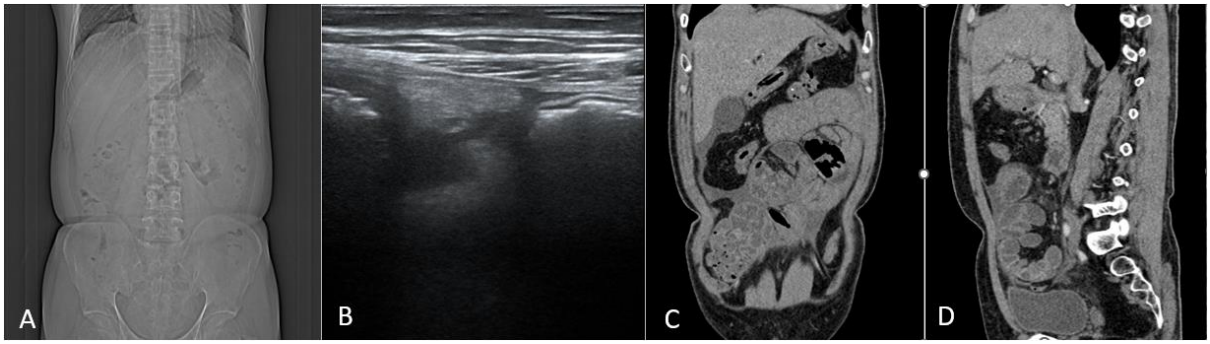

Figure 1 (A)- X ray abdomen showing minimal gas shadows in erect abdomen reflecting a gas less abdomen, (B)- Usg with linear probe showing dilated bowel loops with morderate amount of interbowel fluid in multiple places, (C)- Coronal view of CECT abdomen showing clumping of small bowel loops which are centraly displaced with interbowel collections, (D)- Sagittal view of CECT abdomen showing peritoneal thickening, clumping of bowel loops giving appearance of abdominal cocoon and shows no free fluid in pelvis.

CASE 2

A 56 years old male with long standing history of type II diabetes mellitus attended emergency medicine department with severe abdominal pain, distension of abdomen & vomiting. There was history of intermittent vomiting & constipation for last 1 or 2 months. Patient was on peritoneal dialysis for last 8 months.

On detailed clinical examination tenderness seen in the right lumber region with guarding. Abdomen was grossly distended. Patient was moderately dehydrated & anemic.

The initial abdominal X-ray revealed multiple dilated small bowel loops with air-fluid levels, suggestive of small bowel obstruction. The larged bowel were seen normal. No gas under diaphragm was noted.

On Ultrasonography multiple dilated ileal loops seen with a crowding of bowel loops in right lumber region. There was also evidence of multiple hyperechoic foci seen in peritoneum & bowel walls suggesting calcifications. The ascending colon was not visualized due to gaseous abdomen. The transverse, descending & sigmoid colon were collapsed. No interbowel or free anechoic free fluid collection seen [Fig 2, A].

On CT abdomen multiple dilated bowel loops seen clumping in right lumber region. There was evidence of massive calcifications seen involving the peritoneal reflections & bowel walls predominantly in the right side. A tract used for peritoneal dialysis also visualized in the right abdominal wall. There was no intra peritoneal or interloops hypodense collection noted [Fig 2, B].

On the basis of those findings we diagnosed this case as encapsulating peritoneal sclerosis. Conservative management was prescribed in this case as surgery was not possible due to cardiogenic complications. She eventually died within a month.

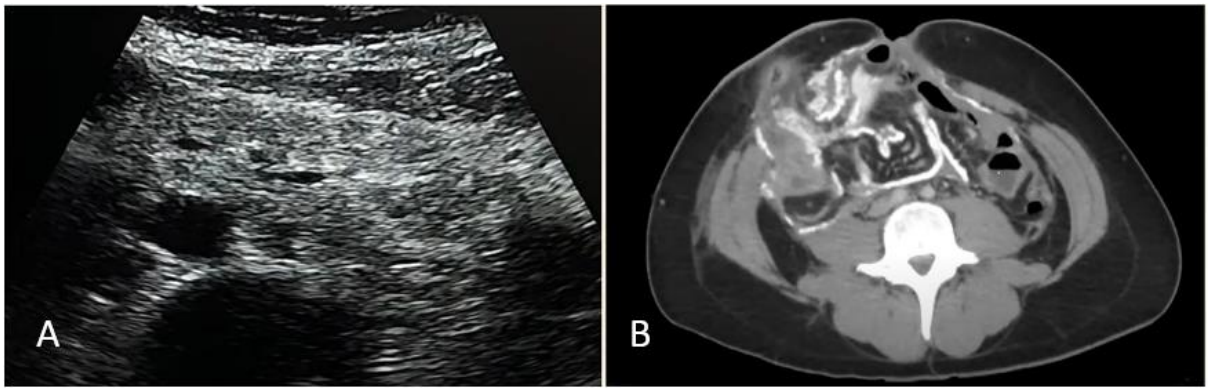

Figure 2 (A) multiple fluid filled dilated ileal loops are seen in right lumber region with numerous echogenic foci in the peritoneum. (B) Multiple dilated ileal loops seen clumped together in right lumber region with peritoneal & mural calcifications.

CASE 3

A 67 yrs old female from a very remote rural place attended OPD with chronic pain abdomen, indigestion, anorexia, weight loss & chronic distension of abdomen. There was no history of any peritoneal dialysis or any history of surgical procedure.

On clinical examination abdominal distension was noted but there was no tenderness, guarding or rigidity. Blood examination showed high ESR and WBC counts suggesting a chronic infective/inflammatory eitiology.

Initial X ray erect abdomen was almost normal. No dilated bowel loops or air-fluid level seen.

On USG the bowel loops were normal in diameter. The bowel walls & peritoneum were thickened with numerous hyperechogenic foci. The bowels were seen clumped in cental part of abdomen near the umbilical area. Minimal anechoic fluid collection seen in peritoneal cavity & interbowel areas.

On CT abdomen, numerous calcifications seen in almost entire bowel wall and peritoneal reflections with clumping of loops in central umbilical area. Hypodense fluid collection seen in subhepatic, subsplenic & pelvic cavity with multiple inter loop collection also seen[Fig 3, A,B].

We gave diagnosis as encapsulating peritoneal sclerosis on the basis of above findings. Patient has improved symptomatically with conservative management as surgical intervention was not possible.

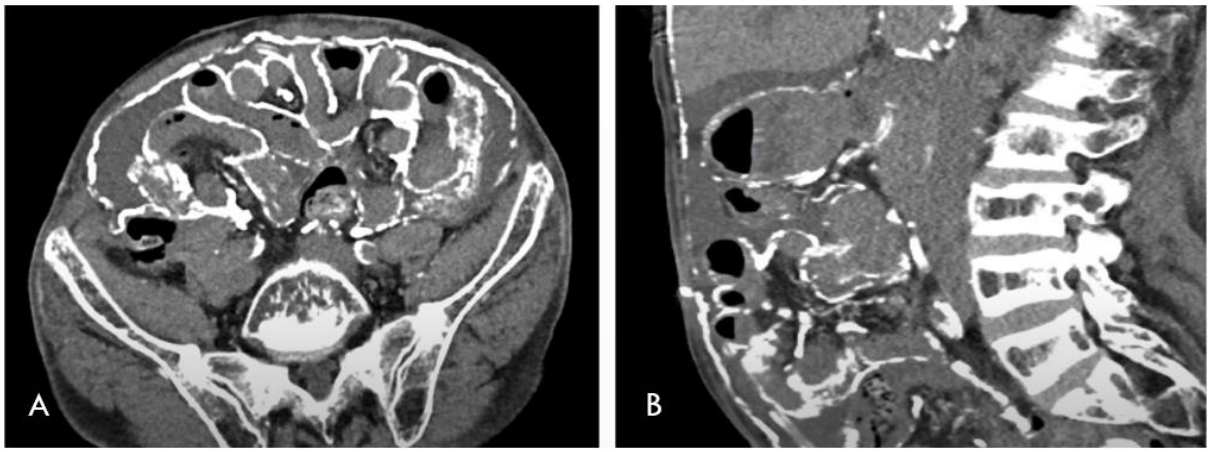

Figure-3 (A) Axial section of NECT abdomen showing numerous calcification in bowel walls & peritoneal reflections, (B) Sagittal section of NECT abdomen showing hypodense collection in subepatic area & interloop areas.

DISCUSSION

Encapsulating Peritoneal Sclerosis (EPS) is a rare and often challenging condition characterized by the development of a thick, fibrous peritoneal membrane that encases the intestines, leading to bowel obstruction, malnutrition, and a range of gastrointestinal symptoms. It is classically associated with long-term peritoneal dialysis (PD), but it can also occur in individuals without a history of dialysis. The pathogenesis of EPS remains poorly understood, but it is believed to result from chronic peritoneal inflammation, which leads to fibrosis and the progressive formation of a "capsule" around the bowel. This fibrotic response causes the bowel to become trapped and obstructed, further exacerbating symptoms of malabsorption and nutritional deficiencies.

The typical presentation of EPS includes nonspecific abdominal symptoms such as abdominal distension, pain, weight loss, and nausea. The condition progresses insidiously, often making diagnosis challenging. Because EPS is not always accompanied by a history of peritoneal dialysis or surgery, its clinical manifestations can easily be mistaken for other causes of abdominal pathology, such as malignancy, infections, or functional bowel disorders.

Imaging plays a critical role in diagnosing EPS, providing essential information about the extent of peritoneal fibrosis, the degree of bowel encapsulation, and the presence of bowel obstruction. In this case, both contrast-enhanced CT and USG were integral in confirming the diagnosis.
The contrast-enhanced CT scan is the gold standard for evaluating EPS. This imaging modality allows for detailed visualization of the peritoneal changes, including peritoneal thickening, fibrosis, and bowel encapsulation.

Surgical intervention, including adhesiolysis and bowel resection, is often required for patients with EPS. Nutritional support, including TPN, and anti-inflammatory treatment are essential components of postoperative care. Early recognition through radiological imaging facilitates timely intervention, improving patient outcomes.

CONCLUSION

Encapsulating Peritoneal Sclerosis is a rare but serious condition that can present with abdominal distention, pain, and bowel obstruction. In our cases, the diagnosis was confirmed at the Department of Radio-Diagnosis, Agartala Government Medical College (AGMC) in 2024 through proper history, contrast-enhanced CT imaging, USG, and abdominal X-ray. Early diagnosis and surgical intervention led to a favorable outcome for those patients. Those cases highlight the critical role of radiological imaging, particularly contrast-enhanced CT scans, in diagnosing and managing EPS.

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