



## Mesenteric Cyst Management and Outcomes: Case Series in Single Institution and Literature Review

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### Abstract

**Introduction:** Mesenteric cysts are a rare intra-abdominal pathology. They are typically discovered incidentally while patients are undergoing work-up or receiving treatment for other conditions. In our paper; we aim to review the current diagnostic and treatment strategies for mesenteric cysts and present our case series managed in our institution.

**Methods:** a retrospective case series consisting of 5 cases were included in the study from 2015-2019 with a mean follow up of one year. Literature review of pubmed included all the published cases series and literature review on the topic.

**Results:** This retrospective study included 4 cases of mesenteric cyst and 1 case of omental cyst. The ages of the patients ranged from 29 to 50 and they were all females. All 5 patients were further assessed with CT, MRI and a PET CT in one case. The sizes of the cysts ranged from 5cm to 17cm. 4 cases had laparoscopic enucleation of the cysts and one case had open surgery due to the large size of the cyst. No recurrence with up to one-year follow-up.

**Conclusion:** The diagnosis of mesenteric cyst is highly dependent on imaging modalities while looking out for radiological features suspicious for malignancy. CT scan and US are the mainstay for the diagnosis. Laparoscopic exploration followed complete excision is the mainstay of treatment.

### Introduction

Mesenteric cysts are a rare intraabdominal pathology. The incidence of mesenteric cysts varies between 1 to 27000 to 1 to 250000 admissions. The history of this pathology dates back to 1507 which was discovered incidentally on a postmortem examination [1]. Reports of mesenteric cysts are higher in females, as is also evident in our series [2]. Mesenteric cysts can occur at any age and they present in different ways. Mesenteric cysts are typically discovered incidentally while patients are undergoing work-up or receiving treatment for other conditions, such as appendicitis, small bowel obstruction, or diverticulitis. Clinically, patients with these cysts present with abdominal pain, distention, vomiting, and nausea, which is the common symptomology for abdominal disease.

Performing a thorough physical examination and conducting ultrasonography and Computed Tomography (CT) evaluations are key in diagnosing mesenteric cysts [1]. Mesenteric cysts can be located anywhere in the GI tract but are most commonly present in the mesentery of the small intestine. The size of mesenteric cysts varies with the larger sized cysts being symptomatic. These cysts are rarely malignant, and their recurrence rate is very low [3,4]. The most common and most treatment option is effective surgical excision. This can be done with minimally invasive or open surgery. Patients usually recover completely after the operation and no further treatment is necessary [5-7]. In our paper, we aim to review the current diagnostic and treatment strategies for mesenteric cysts and present our case series managed in our institution.

Case #	Age	Sex	Symptoms	Diagnosis	Location	Size	Treatment	Pathology
1	29	F	Epigastric pain, vomiting	US, CT	Mesentery of transverse colon	7x10cm	Laparoscopic enucleation	Benign cyst with secondary fat necrosis
2	32	F	LUQ pain, diarrhea, constipation	US, MRI, CT	Mesentery of transverse colon invading the tail of pancreas	17x11cm	Laparoscopic enucleation + distal pancreatectomy	Benign cystic lymphangioma.
3	40	F	Left abdominal mass	US, CT	Posterior peritoneum near the descending colon	8x6cm	Laparoscopic enucleation	Benign cyst lined by a single layer of flattened cells
4	41	F	Abdominal pain, fever	US, CT	Greater omentum	11x9cm	Open enucleation	Benign cyst
5	50	F	Abdominal pain, diarrhea, constipation	US, CT, PET CT	Mesentery of transverse colon	5x5cm	Laparoscopic enucleation	Benign cystic mesothelioma.

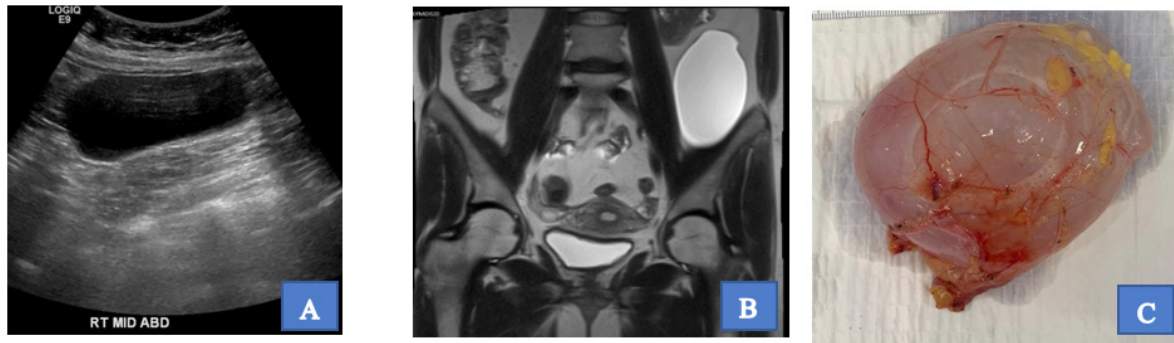
**Table 1:** Demographics of the patients in the cases series.

## Case Presentation

This retrospective study included 4 cases of mesenteric cyst and 1 case of omental cyst. The ages of the patients ranged from 29 to 50 and they were all females. The most common presenting symptom was chronic intermittent abdominal pain and in one case the main presenting symptom was palpable abdominal mass. Alternating constipation and diarrhea were present in two of the patients and fever in one. Nausea and vomiting were not present in any cases except one. In most cases, an ultrasound was enough to make the diagnosis. However, further imaging was necessary to further assess the cystic lesions and its relationship to the surrounding structures. All 5 patients were further assessed with CT, MRI and a PET CT in one case. The PET CT was requested in one patient due to presence of anemia and presence of large cyst on CT so in order to rule out malignancy pre operatively, the PET CT was requested. Table 1 summarizes the demographics for the patients included in the study with the site, size, location and final pathology.

The location of the cysts was in the mesentery of the transverse colon in three cases, the greater omentum in one case, and in the retroperitoneum mesocolon and the tail of the pancreas in one case. The sizes of the cysts ranged from 5cm to 17cm. In 4 of the cases, the cysts were managed with laparoscopic enucleation of the cysts. One case underwent laparotomy and cyst enucleation due

to the adhesions and the large size of the cyst. The final pathology showed benign cysts in all cases. One case was reported as cystic mesothelioma and one case was reported as cystic lymphangioma. The other 3 cases were not further investigated for origin. The length of stay in most cases ranged from 1-3 days. However, one patient stayed in the hospital for 7 weeks because she underwent distal pancreatectomy and developed pancreatic leak. There were two cases that had post-operative complications. In one case, the patient had pancreatic leak as the cyst was in invading the tail of the pancreas. During the surgery the invasion to the pancreas necessitated distal pancreatectomy to ensure complete removal of the cyst. This leak was managed conservatively, with NPO and TPN for 4 weeks and then she was gradually started on diet. As a result, the patient was discharged home seven weeks after the surgery because she had intermediate output from the fistula and needed high dose somatostatin. The other complication was developing tachycardia and hypotension in another patient which was due to high doses of narcotics and was managed conservatively. In one case, a follow up ultrasound was done at 6 months and did not show recurrence. Follow up CT of the patient complicated with the pancreatic leak at 6 months and one-year post operatively showed no signs of recurrence. No imaging was done for the rest of the cases and there were no clinical signs of recurrence. (Figure 1) shows pre-operative images and post-operative specimen for some of the patients in the case series.



**Figure 1:** A: US image showing mesenteric cyst for one of the patients with clear echogenicity and no enhancement of the wall, B: CT scan for one of the patients showing the clear consistency of the cyst with no enhancement or thickening of the wall. C: post-operative image of one of the mesenteric cysts removed from one of the patients (with clear gelatinous fluid inside the cyst).

The mean follow-up for the patients was one year with no signs of recurrence. Table 2 shows details of the follow up and length of hospital stay. Figure 1 showed US and CT images pre-operatively for the patients and one post-operative image for a mesenteric cyst.

Case#	LOS	Complications	Follow up	Follow up Imaging	Recurrence
1	3 days	Tachycardia/hypotension	1 year	None	no
2	7 weeks	Pancreatic leak	2 years	CT	no
3	1 day	None	4 years	None	no
4	2 days	None	2 years	None	no
5	3 days	None	1 year	US	no

**Table 2:** Follow up for the patients and recurrence rate.

## Discussion

Mesenteric cysts have various presentations. The presentation depends on location, size and manifestations of complications. Patients may be asymptomatic in which case mesenteric cysts are an incidental finding on imaging, surgery for another cause or physical exam. Symptomatic patient can present with an array of symptoms, most commonly abdominal pain, followed by abdominal swelling and lastly distension [1,2,5]. Complications may include intestinal obstruction or infection of the cyst. Our series reflected this with the most common presentation being abdominal pain. However, none of the patients presented with a complication from mesenteric cyst.

The location of mesenteric cysts can vary, with the most common location reported in the small bowel mesentery, half of which were identified in the ileal mesentery followed by mesocolon and retroperitoneum [1,2,5]. Majority of cysts are single but they can uni or multi-locular. The cyst wall is usually lined by a single layer of epithelium and the fluid can be chylous, serous or hemorrhagic [2,3,8]. Fluid composition relates to the suspected

etiology of these cysts. While not yet clearly understood, chylous cysts have been hypothesized to originate from obstructed or traumatized lymphatics. Alternatively, De Parrot et al, proposed a classification system based on origin, which includes simple lymphatic cysts, cysts of mesothelial origin, cysts of enteric origin, cysts of urogenital origin, mature cystic teratoma, and pseudocysts [4].

Malignant cysts are accounted for in literature with an incidence of about 3% [3]. Despite this being a very rare entity in an already rare finding, it must be considered in the differential diagnosis when a mesenteric cyst is encountered. Malignant transformation of benign cysts has also been reported, which favors prompt treatment once discovered [3,4]. Mesenteric cysts can be diagnosed using different imaging modalities. The broad range of presentation make imaging very valuable in reaching a diagnosis. The finding on plain x-ray may show evidence of a mass or displacement of bowel [4]. Barium studies may demonstrate mass effect, displaced bowel and obstruction [4]. Ultrasound, CT and MRI are more accurate in aiding the diagnostic workup and all of our patients had a preoperative diagnosis of mesenteric cyst.

Ultrasound is useful in characterizing the internal nature of the cyst while CT is more advantageous with the determination of the type of fluid content [1,4]. Magnetic Resonance Imaging (MRI) in addition to aiding with identifying cyst content, adds a further advantage of being more accurate in identifying the location of cyst [6]. In one of our patients, we requested an MRI before surgery to assess the relationship of the tail of the pancreas to the cyst in order to plan the surgery. Imaging can also point in the direction of malignancy. Thick cyst wall or the presence of nodule raises the suspicion of malignancy [9-11]. Treatment options have varied over the years, ranging from surgery, laparoscopic or open, which includes marsupialization, resection and enucleation to less invasive methods such as ultrasound guided ablation. The current treatment of choice is surgery. Aspiration and marsupialization are controversial approaches due to the rate of recurrence and possible introduction of infection [5-7]. Complete enucleation is recommended for benign lesions. Lesions adherent to surrounding structures may require resection of bowel. Similarly, in the case with close attachment to the tail of the pancreas, we had to remove part of the pancreas to ensure complete removal of the cyst. Percutaneous ethanol ablation has been reported with shrinkage in lesion in size but not complete resolution. This however was a single case report and would require further investigation [12].

Minimally invasive surgery is safe and viable technique for the excision of mesenteric cysts [13]. With the advantage of shorter hospital stay. Laparoscopic surgery with satisfactory results and complete resection is feasible as demonstrated by our series as well. Laparoscopic surgery is also associated with earlier return to normal functional status [14,15]. One of the limitations of the study is that it is a retrospective analysis. We have small number of cases which could be attributed to the rarity of the pathology however this limits the potential observational value of the study. Nevertheless, the study remains important because it demonstrates various presentations, imaging modalities and treatments available for mesenteric cysts. Furthermore, management of all the patients by one team lead to unification of the management and treatment modalities.

The management of mesenteric cysts relies on detailed history taking, thorough examination and imaging of the abdomen. We recommend CT scan as the imaging modality of choice although ultrasound may be sufficient and adds valuable information about the consistency of mesenteric cysts. We also recommend laparoscopic resection for these cysts due to the advantages it offers a patient. Prognosis is good with low recurrence rates.

## Conclusion

Mesenteric cysts are rare intraabdominal masses which present with a variety of symptoms in different locations within the abdominal cavity. Since these lesions have different origins, the

symptom and locations will differ from one patient to another. The diagnosis is highly dependent on imaging modality while looking out for radiological features suspicious for malignancy. CT scan and US are the mainstay for the diagnosis. Laparoscopic exploration followed complete excision is the mainstay of treatment.

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