



# Variable Presentations of Mesenteric and Omental Cysts in Infancy and Childhood: Long-Term Follow-Up

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## Abstract

**Background/Purpose:** Mesenteric and omental cysts are rare intra-abdominal pathology. Clinical presentation depends on the size of the cyst. Small cysts may be asymptomatic or may present with acute abdomen. The aim of this study is to present a long term study of mesenteric and omental cysts in infancy and childhood with variable presentations.

**Patients and Methods:** This study was carried out in Al-Azhar University Hospitals, Cairo, Egypt and King Abdul Aziz Specialist Hospital, Taif, Saudi Arabia, in the period from January 2000 through January 2015. The period of follow up was 15 years on average. The study included twenty two cases. Their ages ranged from 7 days to 12 years. 18 (81.8%) patients presented with an abdominal mass without signs consistent with intestinal obstruction and 4 (18.2%) patients presented with acute abdomen. Patients were investigated by abdominal U/S, C.T. scanning and lab studies. Exploratory laparotomy was performed in nineteen patients and assisted laparoscopy for three patients.

**Results:** Out of twenty two cases (14 boys and 8 girls). There were 6 (27.3%) cases of omental cysts and 16 (72.7%) cases of mesenteric cysts. 18 (81.8%) patients presented with abdominal mass without signs of intestinal obstruction and 4 (18.2%) patients presented with acute abdomen due to torsion of the long pedicles of three omental cysts (13.6%) and impaction of the fourth omental cyst (4.5%) in the cavity between the urinary bladder anteriorly and rectum posteriorly. Their cyst wall was partially gangrenous in some areas. Out of 16 (72.7%) cases of mesenteric cysts there were 6 (27.3%) cases with multiple fluid-filled cysts, variable in size, arising from the mesentery of the ileum and the biggest cysts were adjacent to its wall and sharing the same blood supply. 10 (45.5%) cases have had a big, single, fluid-filled cyst with short pedicle arising from the mesentery of the terminal ileum.

Transfixation excision of the pedicles was performed in 6 (27.3%) omental cysts and in 9 (40.9%) mesenteric cysts and Ileal resection with a primary end-to-end anastomosis of the ileum in the other 7 (31.8%) mesenteric cysts. Open surgery in 19 (86.4%) cases and assisted laparoscopy in 3 (13.6%) cases. In all cases the postoperative period was uneventful. There was no recurrences or deaths encountered during the follow up period.

**Conclusion:** The mesenteric and omental cysts in infancy and children are rare disease with variable presentations. They always require surgical treatment either open or laparoscopic. There was no evidence of recurrence or deaths during the long-term follow-up period.

**Keywords:** Mesenteric and omental cysts; Pediatric abdominal cyst

## Introduction

Mesenteric and omental cysts are rare intra abdominal disease. The incidence of mesenteric cysts is variable between the international published reports. It ranges between 1 per 105,000 [1,2] to 1 per 250,000 hospital admission [3] and the incidence of omental cysts is even more rare [1,2]. Only 25% of cases diagnosed before the age of 10 years [1,2]. Mesenteric cysts can occur anywhere in the mesentery of the gastrointestinal tract from the duodenum to the rectum, and they may extend from the base of the mesentery into the retroperitoneum [5,6,9].

Children with mesenteric and omental cysts present with deceptive signs causing diagnostic problems. It can present with non specific symptoms, an abdominal lump, acute abdomen or ascites [7,8]. In our study, we present twenty two cases with mesenteric and omental cysts, with different

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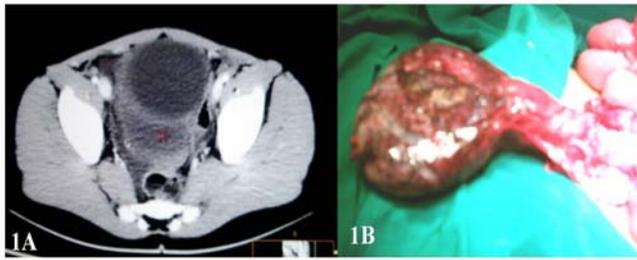
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**Figure 1A and 1B:** (A) C.T scan of the abdomen showing hypodense cystic lesion (10 cm x 8 cm x 15 cm), occupying the pelvic cavity and causing indentation of the dome of the urinary bladder. (B) An Omental cyst (just before excision) is attached to its twisted pedicle (clockwise, more than 360°). The cyst wall is gangrenous in some areas.



**Figure 2A and 2B:** (A): Pelvi-abdominal ultrasound showing a big, well defined cystic lesion, measuring about 12 cm x 5.5 cm. displacing the mesentery posteriorly, with locular pattern at its postero-inferior aspect. (B) Abdominal C.T scan with oral and I.V. contrast study showing a huge hypodense cystic mass. They are occupying the anterior, middle and lower abdominal region and compressing the adjacent organs. The size of the biggest cyst is measuring about 4.5 cm x 10.5 cm x 17cm.



**Figure 2C and 2D:** (C) Multiple yellow, fluid-filled cysts, variable in size, arising from the mesentery of the ileum. The biggest cyst is measuring about 9 cm x 10 cm x 6 cm and sharing the same blood supply of the ileal wall. (D) Standard ileal resection with a primary end-to-end anastomosis of the ileum was done successfully.

presentations in different age groups and treated by different surgical procedures.

## Patients and Methods

This study was carried out in Al-Azhar University Hospitals, Cairo, Egypt and King Abdul Aziz Specialist Hospital, Taif, Saudi Arabia, in the period from January 2000 through January 2015. The study was reviewed and approved by the review board and written consents of patient's parents were taken in accordance with the human rights Committee Guidelines of the Hospital. The period of follow up was 180 months on average (ranged from 12 to 180 months). Twenty two cases (14 boys and 8 girls) were included in this study. Their ages ranged from 7 days to 12 years. Eighteen patients presented with abdominal mass without signs of intestinal obstruction and four patients presented with acute abdomen. Patients

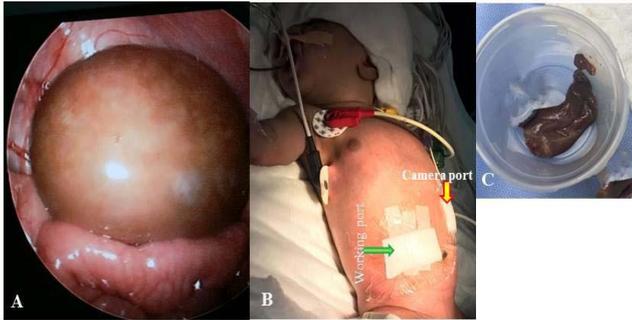
were investigated by routine lab studies including tumor markers and abdominal ultrasound (U/S) and C.T. scanning in some doubtful cases, (Figure 1A, 2A, 2B). Exploratory laparotomy was performed in nineteen patients under general anaesthesia and assisted laparoscopy was performed in three cases, (Figure 4A-4C). Transfixation excision of the pedicles was performed in six omental cysts (Figure 1B) and in nine mesenteric cysts, (Figure 3A, 3B) and Ileal resection ( about 15cm to 20 cm of the mid-ileum) with a primary end-to-end, single layer anastomosis of the ileum in the other seven mesenteric cysts using Vicryl (polyglactin) 3/0 (Figure 2C,2D). All excised cysts were sent for histopathological examination.

## Results

CBC, biochemistry and Tumor markers were within normal limits except leukocytosis in 4 (18.2%) cases of omental cysts. Out of 22 cases there were 6 (27.3%) cases of omental cysts (4 boys & 2 girls) and 16 (72.7%) cases of mesenteric cysts (10 boys & 6 girls). Their ages ranged from 7 days to 12 years. 3 (13.6%) cases of omental cysts developed torsion of their long omental pedicles. Whereas, 4<sup>th</sup> case (4.5%) had a big omental cysts, measuring about 10 cm x 8 cm x 12 cm, occupying the abdominal and pelvic cavity and impacted in the pelvis between the urinary bladder anteriorly and rectum posteriorly. Their cyst wall was partially gangrenous in some areas, (Figure 1A, 1B). Out of 16 (72.7%) cases of mesenteric cysts there were 6 (27.3%) cases with multiple fluid-filled cysts. They were variable in sizes and arising from the mesentery of the ileum, the biggest cysts were adjacent to its wall and sharing the same blood supply, (Figure 2C). 10 (45.5%) cases with a big, single, fluid-filled cyst with short pedicle arising from the mesentery of the terminal ileum, (Figure 3A-3B). The cysts were filled with serous fluid in 17 (77.3%) cases and brownish fluid in 4 (18.2%) cases of omental cysts and one case of mesenteric cyst (4.5%) due to intracystic haemorrhage (Figure 3A). Transfixation excision of the pedicles was performed in 6 (27.3%) omental cysts and in 9 (40.9%) mesenteric cysts and Ileal resection with a primary end-to-end anastomosis of the ileum in the other 7 (31.8%) mesenteric cysts. Open surgery in 19 (86.4%) cases and assisted laparoscopy in 3 (13.6%) cases. Histopathological examination of all cysts revealed variable sized wide spaces lined by flattened endothelial like cells and separated by fibro fatty tissue with bundles of smooth muscle fibers. Areas of hemorrhage and vascular congestion are also seen. No evidence of malignancy could be seen. In all cases the postoperative period was uneventful. Patients were discharged between the 4<sup>th</sup> and the 7<sup>th</sup> postoperative day. There was no recurrences or deaths encountered during the follow up period.



**Figure 3A and 3B:** (A) A single, brownish, fluid-filled cyst is delivered after laparotomy, measuring about 15 cm x 10 cm, connected to the mesentery of the ileum by small and narrow pedicle. (B) An intact single mesenteric cyst measuring about 8 cm x 10 cm x 5 cm, after transfixation excision of its pedicle.



**Figure 4A, 4B and 4C:** (A) A single, brownish, fluid-filled cyst is seen during laparoscopy in a 2 day-old boy, full term, 2.5 kg born with abdominal cyst. It is connected to the mesentery of the ileum by vascular pedicle. (B and C) Extraction of the cyst through the port site (green arrow) after aspiration of the fluid inside the cyst followed by extracorporeal transfixation excision of its pedicle.

## Discussion

Mesenteric and omental cysts are rare intra-abdominal lesions. The incidence of mesenteric cysts is variable between the international published reports. It ranges between 1 per 105,000 [1,2] to 1 per 250,000 hospital admission [3] and the incidence of omental cysts is even more rare [1,2]. Only 25% of cases diagnosed before the age of 10 years [1,2].

In 1507, Benevanni first described this entity in an 8-year-old boy. In 1842, Rokitansky published the first accurate description of a chylous mesenteric cyst. In 1880, Tillaux performed the first successful surgery for a cystic mass in the mesentery [4].

Mesenteric cysts can occur anywhere in the mesentery of the gastrointestinal tract from the duodenum to the rectum, and they may extend from the base of the mesentery into the retroperitoneum [5,6,9].

They most commonly occur in the ileal mesentery of the small bowel or the sigmoid mesentery of the colon [3]. Omental cysts are confined to the lesser or greater omentum [7,8].

In our study, there were 16 (72.7%) cases developed in the ileal mesentery of the small bowel and 6 (27.3%) cases of omental cysts were confined to the greater omentum.

The exact etiology of mesenteric cyst has yet to be ascertained. The most accepted theory, proposed by Gross, is benign proliferation of ectopic lymphatics in the mesentery that lack communication with the remainder of the lymphatic system [10].

Mesenteric and omental cysts can be simple or multiple, unilocular or multilocular, and they may contain hemorrhagic, serous, chylous, or infected fluid [6]. The fluid is serous in ileal and colonic cysts and chylous in jejunal cysts. They can range in size from a few millimeters to 40 cm in diameter [7,9].

In our series, there were 6 cases (27.3%) with multiple fluid-filled cysts. They were variable in sizes and arising from the mesentery of the ileum. The biggest cysts were adjacent to its wall and sharing the same blood supply. 10 cases (45.5%) with a big, single, fluid-filled cyst with short pedicle arising from the mesentery of the terminal ileum. All omental cysts were solitary with long pedicles. The cysts were filled with serous fluid in 18 (81.8%) cases and brownish fluid in 4 (18.2%) cases of omental cysts due to intracystic haemorrhage.

Mesenteric and omental cysts are variable in their presentations. They are often asymptomatic and found incidentally while patients are undergoing work-up or discovered as an incidental finding during laparotomy or laparoscopy for another condition or they can manifest as an acute life-threatening intra-abdominal catastrophe [11].

The most common mode of acute presentation in children is that of a small-bowel obstruction, which may be associated with intestinal volvulus or infarction [12].

In our series we treated 18 (81.8%) patients presented with abdominal mass without signs of intestinal obstruction and 4 (18.2%) patients presented with acute abdomen. 3 (13.6%) cases of omental cysts developed torsion of their long omental pedicles. Whereas, 4<sup>th</sup> case (4.5%) had a big omental cysts, measuring about 10 cm x 8 cm x 12 cm, occupying the abdominal and pelvic cavity and impacted in the pelvis between the urinary bladder anteriorly and rectum posteriorly. The cyst wall was partially gangrenous.

The symptoms are even variable and non-specific and include pain (82%), nausea and vomiting (45%), constipation (27%), and diarrhoea (6%). An abdominal mass may be palpable in up to 61% of patients [11].

The imaging modality of choice is abdominal U/S [8,12]. U/S is a very sensitive and specific radiologic imaging modality used not only for the diagnosis but also for the follow-up of these cysts, even in the prenatal period [13]. However, these can be confused with large ovarian cysts in the fetus and newborn [14]. Despite providing additional information about the location, size, and invasion of the cysts into the surrounding tissues, computed tomography is not generally necessary while evaluating mesenteric cysts in childhood because of the high radiation exposure [13]. Magnetic resonance imaging could be an alternative for evaluation, especially in prenatal cystic lesions [13]. In our study, all cases are diagnosed by abdominal U/S first and confirmed by abdominal CT scanning in doubtful cases.

Cystic lymphangiomas are sometimes differentiated from mesenteric and omental cysts. They have an endothelial cell lining and thin walls that contain lymphatic spaces, lymphoid tissue, and smooth muscle [14,15]. In a series of 191 patients with lymphangioma, 4.7% of patients presented with lymphangioma in the mesentery [16]. In our series, the microscopic examination of sections of the cysts revealed variable sized wide spaces lined by flattened endothelial like cells and separated by fibro fatty tissue with smooth muscle fibers. The walls lack lymphoid tissue and lymphatic spaces. Areas of hemorrhage and vascular congestion were also seen. There was no evidence of malignancy.

Mesenteric cysts can often be shelled out from between the leaves of the mesentery while taking care to avoid damage to the mesenteric vessels [17], or they may require concomitant bowel resection in order to ensure that the blood supply to the bowel is not compromised [7,8]. Omental cysts can always be removed without resection of the adjacent transverse colon or the stomach [7,8]. Partial excision alone with or without drainage is not indicated because of the high recurrence rate associated with these procedures. Approximately 10% of patients require this form of therapy [18]. If marsupialization is performed, the cyst lining should be sclerosed with 10% glucose solution, electrocautery, or tincture of iodine to minimize recurrence [19].

In 1993, Hebra et al mentioned that we have had three recurrences out of 22 cases (0% to 13.6%), but none necessitated reexploration [20]. Essentially no mortality is associated with mesenteric or omental cysts in children; only 1 pediatric death has been reported since 1950 [21].

In our study, exploratory laparotomy was performed in nineteen patients under general anaesthesia and assisted laparoscopy was performed in three cases. Transfixation excision of the pedicles was performed in six omental cysts and in nine mesenteric cysts and Ileal resection with a primary end-to-end, single layer anastomosis of the ileum in the other seven mesenteric cysts. All excised cysts were sent for histopathological examination. During the follow-up period, the postoperative period in all cases was uneventful and there was no a recurrence or deaths.

## Conclusion

The mesenteric and omental cysts in infancy and childhood are rare intra abdominal lesion with variable presentations that always requires surgical treatment either open or laparoscopic. There was no evidence of recurrence or deaths during the long-term follow-up period.

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