Section: General Surgery

Case Report

GIANT OMENTAL CYST IN AN ADOLESCENT BOY PRESENTING AS PROGRESSIVE ABDOMINAL DISTENSION: A CASE REPORT

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ABSTRACT

Giant omental cysts are rare intra-abdominal lesions, especially in adolescents, and often present with non-specific symptoms that delay diagnosis. We report the case of a 17-year-old boy who presented with a two-month history of progressive abdominal swelling and one-month history of diffuse, dull abdominal pain without vomiting, bowel or urinary disturbances, or constitutional symptoms. Examination revealed a distended abdomen with a large, non-tender, smooth, side-to-side mobile mass. Baseline laboratory parameters were within normal limits apart from mildly elevated erythrocyte sedimentation rate. Ultrasonography demonstrated a well-defined, heterogeneously cystic lesion with internal echoes and septations in the right iliac fossa, while contrast-enhanced computed tomography revealed a thick-walled oblong cystic mass measuring 18.7 × 14.7 × 12.3 cm, arising from the right lumbar region, extending to the epigastrium and iliac fossa, and displacing the bowel loops without invasion or calcification. Exploratory laparotomy identified a giant omental cyst measuring approximately 25 × 20 × 15 cm, arising from the greater omentum and lying between the stomach and transverse colon, with additional smaller cystic clusters in the adjacent omentum. Complete excision of the cyst with peritoneal drainage was performed without the need for bowel resection, and the postoperative course was uneventful. Gross examination showed a unilocular cyst with hemorrhagic external surface and brownish friable luminal contents. Histopathology revealed a cyst wall composed of fibrocollagenous to fibroadipose tissue lined by attenuated epithelium, with chronic inflammatory infiltrate, sheets of hemosiderin-laden macrophages, cholesterol clefts, and foreign-body type giant cells, without granulomas or atypia, consistent with a benign lymphatic/lymphangioma-like omental cyst complicated by intracystic hemorrhage. At three to four months of follow-up, the patient remained asymptomatic with no clinical evidence of recurrence.

Keywords: Omental cyst, Giant abdominal cyst, Lymphangioma, Adolescent, Exploratory laparotomy.

INTRODUCTION

Mesenteric and omental cysts are uncommon benign intra-abdominal lesions that arise from the peritoneal cavity and may occur at any age but are particularly important in the paediatric and adolescent population. Their reported incidence ranges from approximately 1 in 100,000 to 1 in 250,000 hospital admissions, making them among the rarest of abdominal tumours.[1,2] Although mesenteric cysts are more frequently encountered, omental cysts constitute only a small fraction of these lesions and are considered even rarer.[2] These cysts may remain clinically silent for long periods or present with a wide spectrum of non-specific abdominal symptoms, making pre-operative diagnosis challenging. Early recognition is nonetheless vital, as delayed diagnosis can lead to progressive enlargement, mass effect on intra-

abdominal organs, and potentially life-threatening complications. Historically, mesenteric and omental cysts were often grouped together under a single descriptive label, but radiologic–pathologic correlation has demonstrated that they represent a heterogeneous group of lesions with distinct histologic subtypes and behaviours. Ros and colleagues proposed a histologic classification that includes lymphangiomas, non-pancreatic pseudocysts, enteric duplication cysts, enteric cysts, and mesothelial cysts, each with characteristic imaging and pathological features and differing implications for management.[3] In paediatric surgical series, most lesions arise from the mesentery of the small bowel, whereas omental cysts are confined to the greater or lesser omentum and are encountered far less frequently.[2] Despite these differences, both entities share similar clinical manifestations and are often considered together in differential diagnoses of cystic intra-abdominal masses in children. The clinical presentation of mesenteric and omental cysts depends largely on cyst size, location, and the presence or absence of complications.[2,4] Smaller cysts are frequently incidental findings during imaging or surgery performed for unrelated reasons, whereas larger lesions tend to present with progressive abdominal distension, vague or colicky abdominal pain, early satiety, constipation, or a palpable mass.[1,2,4] In paediatric cohorts, abdominal mass without signs of obstruction is reported as the most common mode of presentation, although some children present acutely with features of an acute abdomen due to torsion, intracystic haemorrhage, rupture, infection, or bowel obstruction. Case reports underscore that the symptoms are often non-specific and may mimic more common conditions such as ascites, abdominal tuberculosis, or ovarian pathology, particularly when the cyst is large and occupies much of the abdominal cavity.[4,5] The aetiology of these cysts remains incompletely understood, and several theories have been proposed. The most widely accepted mechanism, particularly for lymphangiomatous cysts, is a developmental malformation of ectopic lymphatic channels that fail to establish normal communication with the central lymphatic system, leading to progressive cystic dilatation.[6] Other proposed mechanisms include failure of mesenteric leaf fusion, degeneration of lymph nodes, trauma, previous infection, or neoplastic transformation. Histopathologically, omental and mesenteric cysts may show fibro-collagenous or fibroadipose walls with variable endothelial or mesothelial lining, lymphatic channels, chronic inflammatory infiltrate, and evidence of haemorrhage or cholesterol clefts, features that help distinguish lymphatic malformations from mesothelial or enteric duplication cysts. Contemporary case-based reviews highlight the importance of correlating these microscopic findings with imaging characteristics to refine diagnosis and guide operative planning.[6] Imaging plays a pivotal role in the evaluation of a child or adolescent with a suspected intra-abdominal cystic lesion. Ultrasonography is typically the first-line modality as it is widely available, non-invasive, and free of ionising radiation.[2,4,6] Omental and mesenteric cysts usually appear as anechoic or hypoechoic, uni- or multiloculated lesions, sometimes with thin septations, internal echoes, or debris when haemorrhage or infection is present.[3,4,6] However, large cysts may be mistaken for complex ascites on ultrasound, particularly when they occupy the entire abdomen and create fluid thrill and non-shifting dullness on clinical examination.[6,7] Contrast-enhanced computed tomography (CECT) and magnetic resonance imaging (MRI) provide further details regarding the origin, extent, internal architecture, and relationship of the cyst to adjacent viscera and major vessels. Complete surgical excision remains the treatment of choice for both mesenteric and omental cysts in children and adolescents. Depending on cyst size, location, and the presence of adhesions or involvement of bowel mesentery, resection may be achieved via conventional laparotomy or minimally invasive laparoscopic approaches. Enucleation of the cyst with preservation of adjacent bowel is usually feasible for omental lesions, whereas mesenteric cysts sometimes require segmental bowel resection to preserve adequate vascular supply. Partial excision, deroofing, or simple aspiration have been associated with high recurrence rates and are therefore discouraged except in selected situations where complete excision is not technically possible. Large series and recent reviews emphasise that prompt surgical removal not only relieves symptoms but also prevents serious complications such as volvulus, haemorrhage, rupture, infection, and, very rarely, malignant transformation.[5,7] Giant omental cysts typically defined as lesions that occupy most of the abdominal cavity or measure more than 10–15 cm in maximum dimension are particularly rare, especially in older children and adolescents.[6,7] In many reported cases, these lesions have been misinterpreted clinically as massive ascites, haemoperitoneum, or tubercular peritonitis, leading to inappropriate initial treatment and significant diagnostic delay.[6,8] Massive cysts can cause profound abdominal distension, respiratory compromise due to diaphragmatic elevation, early satiety, weight loss, and occasionally severe anaemia from intracystic haemorrhage or rupture into the peritoneal cavity.[8] Recent paediatric case reports describe presentations with shock and life-threatening haemorrhage, underscoring that, despite their benign histology, giant omental cysts can behave in an acutely life-threatening manner when complicated.[7]

Case Presentation

Patient Information

A 17-year-old boy presented to the Outpatient Department of Surgery, HAHC Hospital, New Delhi, with abdominal complaints. His growth and development were normal, and there was no family history of similar illness.

Presenting Complaints

The patient complained of swelling in the middle and right side of the abdomen for the last 2 months and diffuse, dull abdominal pain for 1 month. The pain was associated with gradual abdominal distension. It was not related to food intake, and there was no history of vomiting. There was no history of fever, jaundice, constipation, burning micturition, or any bleeding manifestations. There was also no history of contact with a person having tuberculosis or any history of abdominal trauma. He had no loss of appetite.

General Physical Examination

On general physical examination, the patient was anicteric, with no edema. His vital signs were within normal limits. There was no evidence of lymphadenopathy, and his anthropometric measurements were within the normal range.

Abdominal Examination

On abdominal examination, the abdomen was found to be distended. A large, non-tender swelling was palpable, which had a smooth surface and well-defined borders. The swelling was movable from side to side.

Laboratory Investigations

Laboratory investigations revealed a hemoglobin level of 11.8 g/dL and an erythrocyte sedimentation rate of 49 mm in the first hour. The total leukocyte count was 4170/cm³, with differential counts showing neutrophils 71%, lymphocytes 16%, eosinophils 2%, and basophils 0%. The platelet count was 4,47,000/cm³. Urinalysis showed a pH of 7.5, specific gravity of 1.010, 1–2 pus cells, and 1–2 epithelial cells per high-power field.

Radiological Investigations

Ultrasonography of the Abdomen

Ultrasonography of the whole abdomen revealed a well-defined, 16 × 11 cm heterogeneously cystic mass lesion in the right iliac fossa. The lesion showed echogenic solid components, fine septations, and dense internal echoes and was seen projecting into the abdominal cavity. Multiple enlarged lymph nodes were seen in the vicinity, the largest measuring 6 mm in short-axis diameter. Other abdominal organs appeared normal.

Contrast-Enhanced Computed Tomography (CECT)

High-dose contrast-enhanced computed tomography (CECT) of the whole abdomen revealed a large thick-walled oblong cystic lesion in the right lumbar region, extending inferiorly to the right iliac fossa region and medially up to the epigastrium. It measured approximately 18.7 cm (craniocaudal) × 14.7 cm (transverse) × 12.3 cm (anteroposterior) and was pushing the abdominal viscera contralaterally. A large, non-enhancing soft tissue component was noted within the lesion. No calcification or fat attenuation areas were identified. The lesion was smooth-walled and displaced the bowel loops without engulfing or invading any surrounding structures.

Operative Findings

An exploratory laparotomy with excision of the omental cyst and peritoneal drainage under general anesthesia was performed, and the specimen was sent for biopsy. Intraoperatively, a large cystic swelling measuring 25 × 20 × 15 cm was found, containing hemorrhagic fluid and debris. The cyst was arising from the greater omentum and lying between the stomach and greater omentum, bulging anteriorly. The rest of the intestine was collapsed and pushed downward and laterally. The stomach and transverse colon were not communicating with the cystic swelling. Multiple clusters of cystic swellings were also seen in the omentum adjacent to the transverse colon and greater curvature of the stomach. The postoperative period was uneventful.

Histopathological Examination

Gross Examination

On gross examination, the cystic tissue was unilocular, measuring 12 × 12 × 6 cm. The wall thickness varied from 0.4 to 0.6 cm. The external surface was hemorrhagic with prominent vascular markings. On cutting open, the inner surface of the cyst was smooth, and the lumen contained brownish, thick, friable material.

Microscopic Examination

Microscopic examination showed that the cyst was lined by attenuated epithelial lining. The wall was composed of fibrocollagenous to fibroadipose tissue, which was focally infiltrated by chronic inflammatory cells composed predominantly of lymphocytes and plasma cells, along with sheets of hemosiderin-laden macrophages. The cyst wall also showed cholesterol clefts and foreign body-type giant cells. In some areas, lymphoid aggregates were seen, along with many congested and dilated blood vessels. The lumen showed large areas of hemorrhage. No granuloma or atypia was noted.

Outcome and Follow-up

The patient was discharged on the fourth postoperative day. On follow-up after 3–4 months, the patient remained symptom-free.

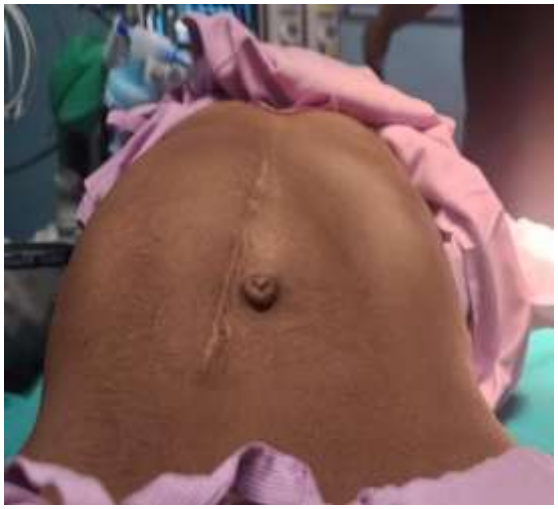

Figure 1: Visible swelling on Abdominal Inspection

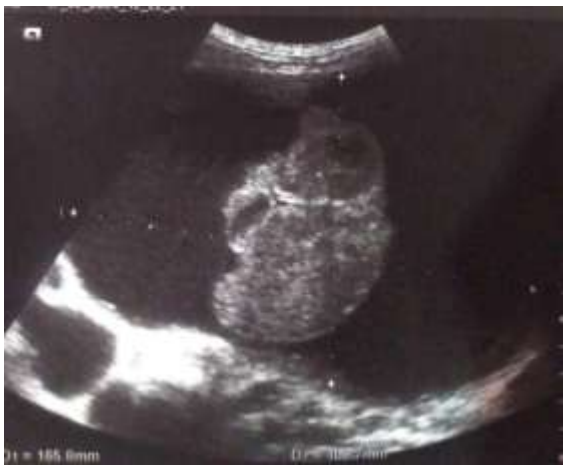

Figure 2: USG Abdomen depicting the large fluid filled cyst

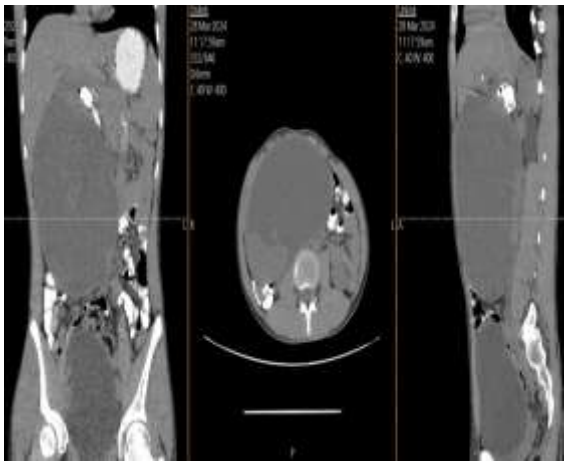

Figure 3: Abdominal CT scan Showing the large cystic lesion

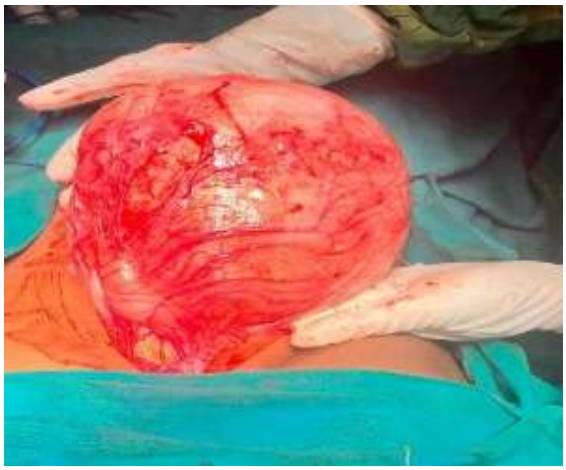

Figure 4: Intraoperative view of the cyst

DISCUSSION

In the present case, a 17-year-old boy was diagnosed with a giant omental cyst measuring approximately 25 × 20 × 15 cm intraoperatively, which is older than the typical age at presentation for intra-abdominal lymphatic cysts in children. Our patient also had the less common omental origin. In the 23-year series by Ghritlaharey et al. (2024), only 3 of 18 children (16.7%) had cysts arising from the greater omentum, while more than four-fifths of patients were ≤5 years at the time of diagnosis, highlighting how unusual an adolescent omental lymphatic cyst of this size is compared with their largely preschool cohort.[9]

Clinically, our patient presented with two months of abdominal swelling and one month of dull, diffuse pain with progressive distension, but without features of intestinal obstruction or systemic toxicity. In contrast, Tripathy et al. (2022) reported that in their series of 32 children with mesenteric cysts, 78% were below 5 years of age and a substantial proportion presented with intestinal obstruction; 10 of 32 children (31%) required bowel resection to permit complete excision of the cysts.[10]

Radiologically, the cyst in our patient was identified as a large, thick-walled, heterogeneously cystic lesion with internal septations and a non-enhancing soft-tissue component on CECT, displacing but not invading adjacent viscera. These features are in keeping with previously described giant omental cysts. Sharma et al. (2021), in a five-year experience with 35 pediatric mesenteric cysts, reported an average cyst size of 15 cm (range 5–25 cm), with many lesions causing mass effect and occasionally obstruction.[11] Our lesion reached the upper range of those sizes and produced marked abdominal distension, but still without obstruction, again underlining the "space-occupying" rather than obstructive behavior of large omental cysts in contrast to mesenteric lesions that more frequently compromise bowel lumen.

Our case also demonstrates that cross-sectional imaging can accurately localize large cysts to the omentum pre-operatively, although intraoperative findings remain the gold standard. Verma et al. (2020) described a 6-year-old boy with gradually increasing abdominal distension in whom a giant intra-abdominal cyst initially suspected to be mesenteric was ultimately proven laparoscopically to be an omental cyst; complete laparoscopic excision was achieved and histology confirmed cystic lymphangioma.[12] In comparison, our patient's imaging suggested an extensive lesion in the right lumbar and iliac regions extending to the epigastrium, and laparotomy confirmed its origin from the greater omentum between the stomach and transverse colon. While Verma et al. could safely approach their cyst laparoscopically in a smaller child, the sheer size (25 × 20 × 15 cm) and multiloculated nature of our lesion, with multiple adjacent cystic clusters, favored open exploration in this adolescent to permit controlled decompression and en bloc removal.

Histopathologically, our cyst showed attenuated epithelium, fibrocollagenous to fibroadipose wall, chronic inflammatory infiltrates rich in lymphocytes and plasma cells, sheets of hemosiderin-laden macrophages, cholesterol clefts, foreign-body giant cells, and luminal hemorrhage, without atypia or granuloma. These findings are compatible with a complicated lymphatic malformation. Yan et al.

(2024), in a seven-year experience of mesenteric and omental lymphatic malformations in children, emphasized that omental lesions often present with larger size and a higher frequency of intracystic hemorrhage or infection than mesenteric lesions, and that histology typically reveals thin-walled lymphatic channels with secondary inflammatory changes.[13]

From a surgical standpoint, our patient underwent open excision of the omental cyst with drainage, without the need for bowel resection, and had an uneventful postoperative course with no symptoms at 3–4 months follow-up. While open surgery remains standard in many centers for giant or complex cysts, minimally invasive techniques are increasingly reported. Chen et al. (2023) described a cohort of children with mesenteric cysts managed using robotic-assisted laparoscopy, demonstrating that complete excision could be achieved with favorable visualization, precise dissection, low complication rates, and rapid recovery.[14] Compared with their robotic series, our open approach achieved similarly excellent early outcomes, but required a larger incision and may be associated with more postoperative pain and a longer scar. Nonetheless, the absence of bowel involvement in our case avoided the higher resection rates (and potential anastomotic risks) often seen in series dominated by mesenteric rather than omental lesions.

Finally, this case highlights the diagnostic importance of combining ultrasound and CT in evaluating large cystic abdominal masses in children and adolescents. In our patient, ultrasound and CECT together delineated a large septated cyst with solid components displacing bowel loops, narrowing the differential diagnosis to lymphatic or omental cyst. Purnama et al. (2024) reported a 2-year-old boy with a massive mesenteric cyst in whom CT initially suggested ascites, whereas ultrasound more clearly demonstrated a septated cystic mass; definitive diagnosis was only established at laparotomy and histology as cystic lymphangioma.[15]

Overall, our 17-year-old boy with a huge omental lymphatic cyst expands the age spectrum and reinforces existing evidence that complete surgical excision, even via open laparotomy, provides excellent short-term outcomes with low recurrence risk when the lesion can be removed without sacrificing major bowel segments.

CONCLUSION

This case highlights that giant omental cysts, though rare, should be considered in adolescents presenting with progressive abdominal distension and a large, mobile, cystic mass. Careful clinical evaluation combined with ultrasonography and CECT helps to delineate the lesion and plan surgery, although definitive diagnosis is often confirmed intraoperatively and histologically. Complete surgical excision of the cyst, even via open laparotomy in very large lesions, can be accomplished safely without bowel resection and is associated with excellent short-term outcomes. Early recognition and timely intervention are crucial to prevent potential complications related to mass effect or intracystic hemorrhage.

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