Original Article

Management Outcomes of Mesenteric Cysts in Paediatric Age Group

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Abstract

Background: Mesenteric cysts are rare intra-abdominal masses and high index of suspicion is required to clinically suspect this pathology and make a definitive diagnosis. They are most commonly located in the ileal mesentery but can be located anywhere along the gastrointestinal tract mesentery and may extend into the retroperitoneum. The rarity of these anomalies and diversity of clinical picture pose challenges in the diagnosis and operative management. The objective of this study is to determine the demographic pattern, clinicopathological diagnosis and management outcome of mesenteric cysts in our hospital. **Materials and Methods:** This retrospective study was conducted on children operated for mesenteric cysts from October 2013 to September 2020. Statistical analysis was performed using Open Epi Version 3.01. **Results:** Out of 32 children with a diagnosis of mesenteric cyst, 78% were below 5 years of age. Small intestine was affected in 26 cases and large bowel mesentery was the site of origin in six cases. Complete excision of mesenteric cyst was possible in all cases. Bowel resection was required in ten cases (31%) to enable complete excision. Bowel resection was required more often in children operated on emergency than those with elective surgery, and is statistically significant ($P = 0.04$; confidence interval: 0.05–0.96, odds ratio: 0.23). An uncommon co-existence with ileal atresia and detection of rare chylolymphatic cyst in another infant were also remarkable findings. Histopathology proved the diagnosis in all cases. There was no mortality or recurrence during hospitalisation and follow-up, which ranged from 3 months to 3 years. **Conclusions:** Mesenteric cysts present with diverse clinical features and children below 5 years of age are most commonly affected. Complete surgical excision is the optimal treatment and may require bowel resection in significant number of cases, especially those operated during emergency. Histopathology is the gold standard for diagnosis.

Keywords: Mesenteric cysts, paediatric age group, surgical excision

Introduction

Mesenteric cysts are rare intra-abdominal lesions, with an incidence of 1:20,000 paediatric hospital admissions.[1,2] They can be located anywhere in gastrointestinal tract mesentery and may extend to the retroperitoneum.[3-5] The presentation varies widely from asymptomatic abdominal mass to life-threatening acute symptoms. The classical sign of Tillaux, 'mobility of mesenteric cysts in transverse plane, and not in longitudinal plane', was described by the French surgeon, who first performed surgical resection in 1880.[6,7] The optimal treatment ranges from simple excision of cyst to massive resection of the adjoining intestine.[4,8] The rarity of these anomalies and diversity of clinical picture pose specific problems in the diagnosis and operative management.[9]

Aim

The objective of this study is to determine the demographic pattern, clinicopathological diagnosis and management outcome of mesenteric cysts in our tertiary care hospital.

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Materials and Methods

This retrospective study was conducted on children at or below 14 years who were operated on and a confirmatory diagnosis of mesenteric cyst was made by histopathological study. Patients in whom a provisional diagnosis of mesenteric cyst was made but surgery was not done due to refusal by parents or who left against medical advice were excluded.

The medical records of patients admitted from October 2013 to September 2020 were reviewed. The diagnosis of mesenteric cyst was based on imaging studies and intraoperative findings. This was confirmed by histopathology of excised tissue. Data were analysed in respect of demographic pattern, operative findings, histological features and outcome.

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After hospitalisation, history, physical examination, plain abdominal X-ray, abdominopelvic ultrasonography, haematological and biochemical investigations were performed. Ultrasonography detected thin-walled cystic lesion in abdomen, supporting a pre-operative diagnosis of mesenteric cyst. Computed tomography (CT) scan of the abdomen was done in 20 cases, which suggested mesenteric cyst [Figure 1]. CT scan also ruled out that the cysts did not originate from other abdominal organs and provided better anatomical delineation of the cysts. Laparotomy was done after initial stabilisation. The exact surgical procedure varies depending upon the intraoperative findings and extent of involvement of bowel. The excised tissue was sent for histopathological study. Post-operative treatment continued with intravenous fluids, antibiotics and supportive measures. Children were allowed oral feeding after return of bowel function. They were discharged after fully recovery and advised for follow-up in outpatient department (OPD) with histopathology report. Duration of follow-up ranged from 3 months to 3 years.

Statistical analysis

Statistical analysis was performed using Open EpiVersion 3.01 (Emory University, Rollins School of Public Health, USA) from www.openepi.com. The data were presented as percentages (%). Comparison between the groups was made by using mid-P exact test with confidence interval (CI). $P < 0.05$ was considered as significant.

Results

There were 17 boys and 15 girls operated for mesenteric cyst during the 7-year study period, with a male-to-female ratio of 1.13:1 [Table 1]. The age distribution ranged from 3 days to 13 years with a median age at presentation of 27 months. Twenty-five cases (78%) were below 5 years of age, including two newborns and six infants. The median weight of the children was 12 kg (range: 2.8–27 kg). Abdominal mass was the most common presenting feature (16 cases), usually accompanied by distension. Ten patients presented with symptoms of intestinal obstruction and six children had abdominal pain without features of obstruction.

Intraoperatively, majority of mesenteric cysts ($n = 26$) were found to arise from small intestinal mesentery [Figure 2]. Cysts were of various sizes and were multiloculated lesions. The diameter

Table 1: Demographic and clinical characteristics of 32 children with mesenteric cyst

Characteristics	Number of cases, *n* (%)
Age	
Neonates	2 (6)
Infants	6 (19)
Children (>1 year)	24 (75)
Sex	
Male	17 (53)
Female	15 (47)
Presentation	
Acute	16 (50)
Chronic	16 (50)
Chief presenting feature	
Abdominal mass	16 (50)
Acute intestinal obstruction	10 (31)
Pain abdomen without obstruction	6 (19)
Surgical intervention	
Urgent	12 (38)
Elective	20 (62)
Location of mesenteric cyst	
Jejunum	11 (34)
Ileum	15 (47)
Colon	6 (19)

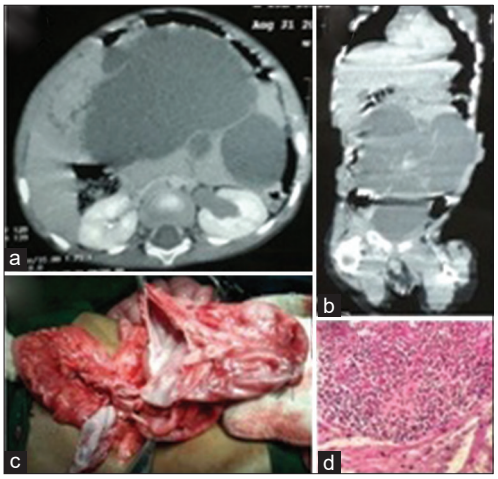

Figure 1: A 23-month male child with mesenteric cyst arising from sigmoid mesocolon, (a and b) CT scan showing large abdominopelvic multiloculated cystic lesion with internal enhancing thin septa, displacing large bowel loops laterally, (c) Intraoperative photograph showing cystic mass in sigmoid mesocolon, (d) Microsection: Cyst wall fibrocollagenous infiltrated with lymphocytes and plasma cells. Confirming diagnosis of mesenteric cyst (H and E ×400)

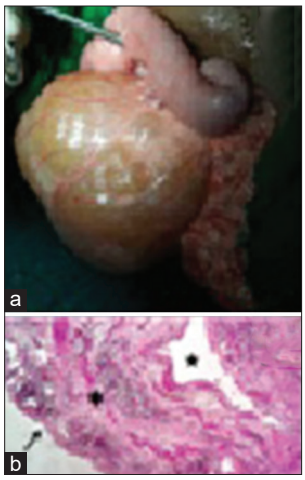

Figure 2: One-year and 8-month female child with mesenteric cyst, (a) intraoperative picture showing multiloculated cystic mass in the mesentery of small intestine, (b) histopathology: Cyst wall lined by flattened endothelial lined cells (thin arrow); dilated lymphatics (star); wall infiltrated with lymphocytes (short arrow). Proving the diagnosis of mesenteric cyst (H and E, ×100)

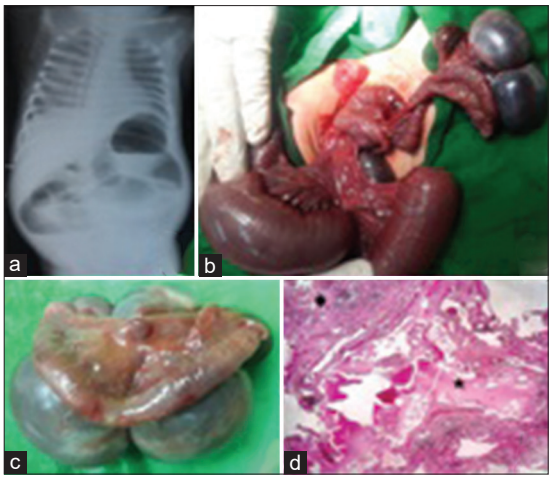

Figure 3: Three-day female with mesenteric cyst and type IIIa ileal atresia (a) abdominal radiography showing dilated bowel loops with air–fluid levels and absence of distal gas in pelvis, (b) intraoperative photograph showing dilated proximal ileum, mesenteric defect and multiple cysts located in the mesentery of distal atretic ileum (c) resected cystic mass with adjacent atretic ileum, (d) microsection: Lymph fluid with lymphocytes (star) evident in lymphatic cyst (short arrow) and lymphoid aggregates seen in the wall (H and E, ×100)

Table 2: Comparison of operative procedures between two clinical groups

Surgical intervention	Excision of cyst and anastomosis	Excision with resection	CI	*P*
Emergency	4	8	0.05-0.96	0.04*
Elective	18	2	0.84-29.78	0.08
Total	22	10		

*P<0.05 (significant) mid-P exact test. CI: Confidence interval

of excised cysts ranged from 4 cm to 27 cm along the long axis (median size: 12 cm). Eleven cases (34%) were smaller than 10 cm and six cases (19%) were larger than 20 cm. Cysts originated from the large bowel mesentery in six cases, four of these were from the sigmoid mesocolon. Volvulus of intestine caused by mesenteric cyst was found in eight cases and two cases were associated with perforation. Complete excision of mesenteric cyst was possible in all cases. However, resection of involved intestine was required in ten cases. Bowel resection was required more often in children operated on emergency basis than those done as elective surgery and the result was found to be statistically significant (P = 0.04; CI: 0.05–0.96; odds ratio: 0.23) [Table 2].

A 3-day-old female newborn had neonatal intestinal obstruction from type IIIa ileal atresia along with multiple cysts in the mesentery of distal ileum [Figure 3]. Subsequent histopathological study confirmed mesenteric cyst in the mesentery of atretic ileum, an extremely rare association. A rare variant of mesenteric cyst; 'chylolymphatic cyst', was also seen in a 2-month-old female infant [Figure 4]. The multicystic lesion was found in the ileal mesentery, approximately 30 cm proximal to ileo-caecal junction. No major complications were noted, except wound infection in four cases. None of the cases

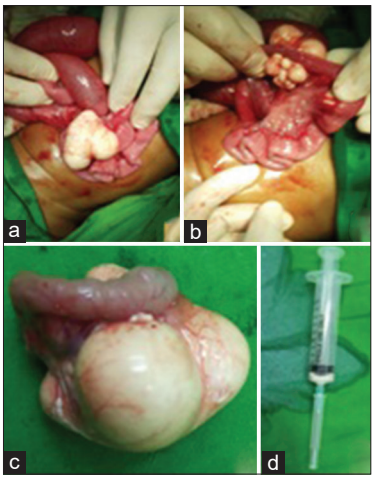

Figure 4: A 2-month-old female infant with chylolymphatic cyst, (a and b) Intraoperative photographs showing milky white cystic mass in the mesentery of ileum, (c) excised chylolymphatic cyst along with adjoining ileum, (d) aspiration of a cyst revealing chylous fluid

required re-exploration. The patients were discharged usually on the 2nd post-operative week and advised to attend OPD with histopathology report. No evidence of malignancy was found in any case. Recurrence of mesenteric cyst was not reported during follow-up.

Discussion

Although mesenteric cysts can occur at any age, children below 5 years are most commonly affected.[2,3,5] In our study, 78% of cases were below 5 years, which is similar to above reports. The median age at detection is reported as 46 months.[10] However, it was 27 months in our study. This may be a reflection that patients are presenting earlier in recent years. In contrast to adult population, where it is reported as more common among females, males are more frequently affected in paediatric age group.[1,2,6] A slight male preponderance was also observed in the present study.

As mesenteric cysts arise from a variety of location in the gastrointestinal tract, there may be wide spectrum of symptomatology.[9] In general, they can present in three ways: incidentally diagnosed during routine physical examination or imaging (approximately 40% of cases); nonspecific abdominal symptoms such as pain and distension and acute abdomen, usually due to complications of mesenteric cyst (approximately 33% of cases).[6,7] In comparison to adults, acute symptoms are more commonly observed in childhood.[10,11] Abdominal pain is described as the most common presenting feature in many series.[5,8,12] However, intestinal obstruction constituted 53% and 70% of presentation in series reported by Prakash *et al*. and Ghritlaharey, respectively.[1,3] However, it was found in 31% of cases in this series and abdominal mass was the most common mode of presentation. Our findings corroborate with Gafar and Batikhe, who detected abdominal mass as the chief presenting feature (61%).[9]

Small intestine, especially ileal mesentery, is described as the most common location of mesenteric cyst.[3,7] Large gut is

involved in 15% and 18% of cases in series reported by Gafar and Batikhe[9] and Prakash *et al*.,[3] respectively. Our finding in this respect corroborates with the above studies as small and large gut were involved in 81% and 19% of cases, respectively. Sigmoid mesocolon is the most common location in this category and similar findings were also detected in our study.[2,3] Complete excision is the treatment of choice to avoid the risk of recurrence.[1,8,13] Segmental bowel resection is necessary if intestinal vascularity cannot be preserved.[8] In comparison to adults, where resection and anastomosis is needed in 33% of cases, approximately 50%–60% of paediatric cases require this procedure.[2,12] Bowel resection was required in 31% of our cases to enable complete excision of cysts. Comparison of bowel resection between emergency and elective surgery for mesenteric cyst was made and the results were found to be statistically significant ($P = 0.04$; mid-P exact test).

Patients with retroperitoneal cysts are difficult to excise completely and may require multiple operations.[5] Although retroperitoneal extension was found in three of our cases, total excision was possible. The co-existence of mesenteric cyst with intestinal atresia detected in one patient in the present study is extremely rare and <10 cases were mentioned in the literature.[14] Mesenteric cysts might be causing mesenteric vascular compromise due to volvulus, followed by intestinal atresia, a disorder occurring during later part of intrauterine life.[14-16] Another important observation was chylolymphatic cyst causing bowel obstruction, in a 2-month old infant. This is a rare variant of mesenteric cyst and only a few cases have been reported.[4,17] They contain both chyle and lymph. The accumulation is considered to be due to imbalance between inflow and outflow of chylous and lymphatic fluid.[4]

Although pre-operative imaging findings are suggestive of the lesion, histopathological studies are the gold standard for conclusive diagnosis. The cyst wall is lined by flattened endothelial cells with dilated lymphatic channels and infiltrated by lymphocytes and plasma cells.[17] Enteric duplication cysts and mesothelial cysts are major differential diagnosis. Duplication cysts show the layers of intestine in cyst wall, mucosal lining and do not contain the lymph fluid or lymphoid aggregates. Cystic mesothelioma might be having similar findings but cysts are lined by mesothelial cells without smooth muscle and are usually seen in adult females.[10] In general, the major post-operative complication is recurrence of cysts, which is reported from 0% to 16% of cases.[2,10] This is particularly seen in cases with partial excision, marsupialisation and among cysts extending into retroperitoneum.[4] Mortality has also been reported in up to 3% of cases, especially following massive bowel resection due to volvulus and short gut syndrome.[5,10,13] There was no mortality in the present study and none recurred during follow-up period.

Limitations

The major limitation of the study is limited number of cases, which is due to rarity of these malformations. Again, this is a single-centre retrospective study.

Conclusions

Mesenteric cysts commonly affect children below 5 years of age and distal small bowel is most frequently involved. Complete surgical excision is the optimal treatment and may require resection of the adjoining segment of intestine. Bowel resection is required significantly more often in children operated on emergency basis than those done as elective surgery. Although imaging studies suggest the lesion, post-operative histopathology is the gold standard for diagnosis.

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Conflicts of interest

There are no conflicts of interest.

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