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Mesenteric Cysts – A Series of Six Cases with a Review of the Literature

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Abstract

Background: Symptomatic mesenteric cysts account for only 1 in 100,000 acute adult and 1 in 20,000 acute paediatric admissions. Acute symptoms are related to compression of intra-abdominal organs or stretching of the mesentery by rapid expansion. An abdominal mass, mobile in transverse but not longitudinal plane, is often the only physical finding.

Method: We outline the presentation, management and histological findings of 6 cases that presented to this hospital from 1987-1997.

Results: There were 5 adults aged 32-79 yr and an 8 yr old boy. The child presented acutely with a painful tender abdominal mass. Of the adults, 1 presented acutely, 2 with chronic symptoms and 2 were incidental findings. Mesenteric cysts were successfully resected in all cases.

Conclusion: Surgical intervention is recommended and resection of adjacent bowel may be necessary for complete excision. Successful minimal access surgery via the laparoscope has been reported and may become more widely applicable.

Introduction

Mesenteric cysts are rare entities, accounting for only 1 in 100,000 acute adult admissions to hospital[1,2]. They present in all age groups with a peak incidence in the fourth decade[3]. One-third of all cases are paediatric, the first yr of life accounting for 5 per cent of the total[3-5], where presentation are usually acute (1:20,000 acute paediatric admissions) due to rapid progression of symptoms[1].

The first description was by an Italian anatomist named Benineni in 1507. He described a mesenteric cyst found on post-mortem examination of an 8 yr old boy[6]. Over 300 yr later (1850) Tillaux performed the first successful resection of a mesenteric cyst[7]. He was followed by Pean, who in 1883 outlined the first marsupialisation of a mesenteric cyst[1]. Since then over 1000 cases have been described in the literature.

We outline 6 cases that presented to this hospital over a 10 yr period, including presentation, radiological features, management, histological findings (where appropriate) and patient outcome. We review the literature and discuss the management options.

Case Histories

1. A 79 yr old female complaining of dyspepsia. Examination, blood biochemistry and full blood count were normal. Ultrasound of abdomen revealed a large cystic anterior to the aorta adjacent to the pancreas. Computed tomography (CT) scan of abdomen (Figure 1) confirmed the diagnosis of a large mesenteric cyst that was subsequently resected.

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2. A 32 yr old male was admitted electively for investigation of right iliac fossa pain, constipation and blood per rectum. Examination was unremarkable other than a palpable mass on rectal examination. Ultrasound of pelvis confirmed a complex mass between the bladder

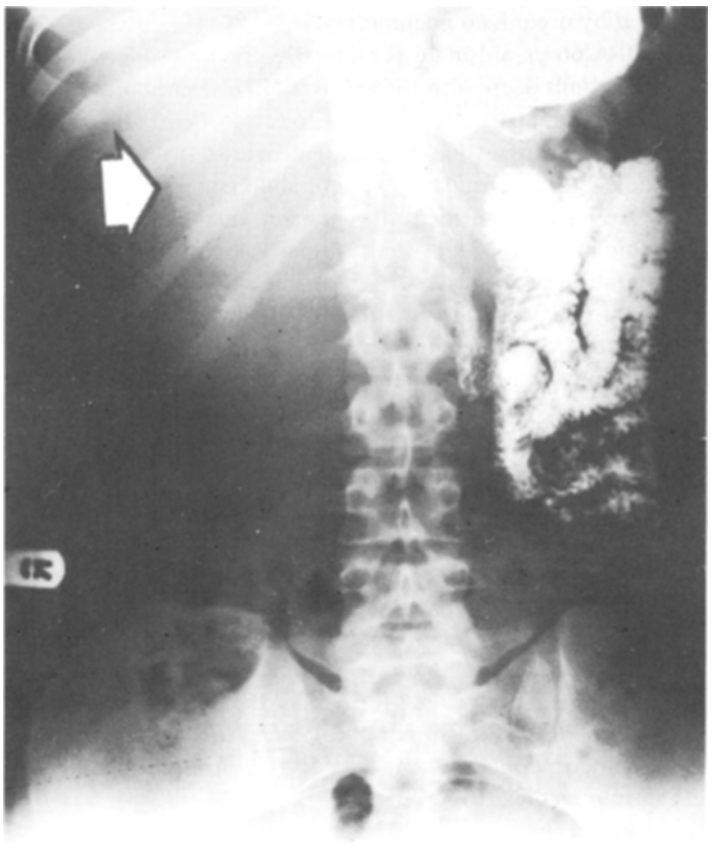

Fig. 1 – CT abdomen (from case 1): mainly cystc mass lying (arrowhead) to the right of the midline.

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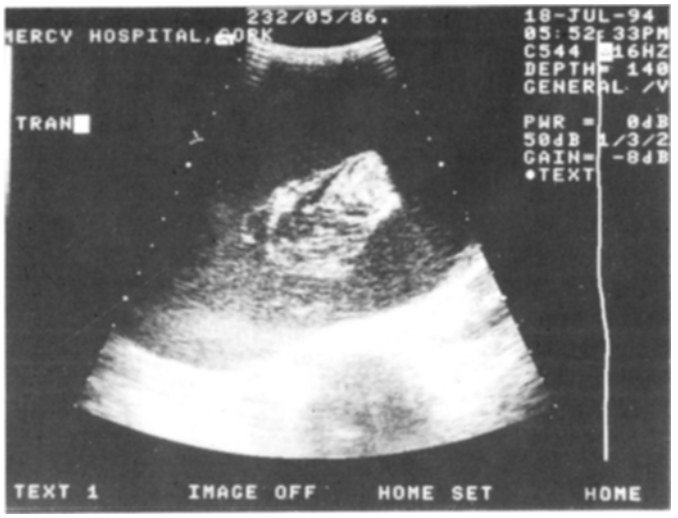

Fig. 2 – Transverse ultrasound scan (from case 4): separated cystic mass in the epigastrium containing thick fluid with some debris, most likely due to recent haemorrhage.

and rectum, indenting the bladder. CT scan of abdomen confirmed a well-defined lesion of low soft tissue density and high fluid content. Colonoscopy and intra-venous urography were normal while barium enema revealed a narrowing at the recto-sigmoid junction due to extrinsic compression. At laparotomy a multiloculated cystic friable mass was dissected easily from the recto-vesical space. Histological sections showed a cyst with a fibrous wall lined by organized haematoma.

3. A 66 yr old male presented with extensive bilateral lower limb deep vein thromboses. Investigation revealed a 7 cm cystic structure anterior to the aorta on ultrasound. Upper and lower gastrointestinal endoscopy and barium studies were normal. CT scan of abdomen demonstrated a cystic lesion anterior to the inferior vena cava (in which thrombosis was identified). Laparoscopic guided needle aspiration of the cyst was performed to aid resolution of the thrombosis. The cyst, which refilled within two months, was resected from the ileal mesentery at laparotomy. Histology confirmed a mesenteric cyst.

4. A 67 year old female presented with obstructive jaundice. CT scan of abdomen, ultrasound of abdomen and laparoscopy with biopsy diagnosed carcinoma of the pancreas. She underwent a Whipples procedure and an incidental finding was a histologically benign 4 cm mesenteric cyst not visualised by CT scan or ultrasound.

5. A 34 yr old female presented with a history of recurrent central abdominal pain, vomiting and anorexia for the preceding 3 days. She had mild periumbilical tenderness with a vague fullness of the upper abdomen on examination. Ultrasound revealed a cystic mass in the mid abdomen which was seen to displace the duodenum on barium studies (Figure 3).

6. An 8 yr old male presented with severe crampy abdominal pain of 3 days duration associated with anorexia, vomiting and diarrhoea. He gave a history of similar attacks ever 3 to 6 months lasting from a few hours to 3 days with increasing frequency and duration. One yr previously he underwent an open appendectomy in another hospital.

On examination he was pale and unwell. His abdomen was obviously distended. Palpation revealed a tender, relatively immobile mass, arising out of the pelvis and occupying most of the abdomen. Full blood count and biochemistry were unremarkable. Ultrasound of abdomen revealed a multiloculated cyst and bilateral hydronephrosis (Figure 2). CT scan of abdomen confirmed these findings and intravenous urography displayed extrinsic ureteric compression. At laparotomy, the 20 cm mesenteric cyst was excised en-bloc with a 28 cm segment of ileum. Histology confirmed a mesenteric cyst with numerous lymphatic vessels and recent haemorrhage into the cyst.

Etiology/Pathology

There are several theories regarding the aetiology of mesenteric cysts, all of which involve abnormalities of the lymphatic system. Growth of congenitally malformed, misplaced or malpositioned lymphatic tissue, or failure of the mesenteric leaves to fuse during the embryonic development are plausible suggestions[4,8]. Obstruction and/or degeneration of exiting lymphatic channels has also been proposed[9,10]. However, experimental and therapeutic ligation of the thoracic duct does not result in mesenteric cyst formation[11], presumably because there is an extensive collateral system. It has been suggested that mesenteric cysts are not blinded sacs, but rather represent patent systems where inflow-outflow mismatch occurs[12]. The extent of the mismatch determines the rate of growth and therefore the age of presentation. The putative congenital basis is underlined by the variable incidence and age distribution in Caucasians, Afro-Americans and Japanese populations[8,13].

The cysts may be single or multilocular and are found anywhere in the leaves of the mesentery from the duodenum to the rectum. The commonest site is the small bowel mesentery (50 per cent), with the mesocolon (33 per cent) and mesorectum (10 per cent) accounting for

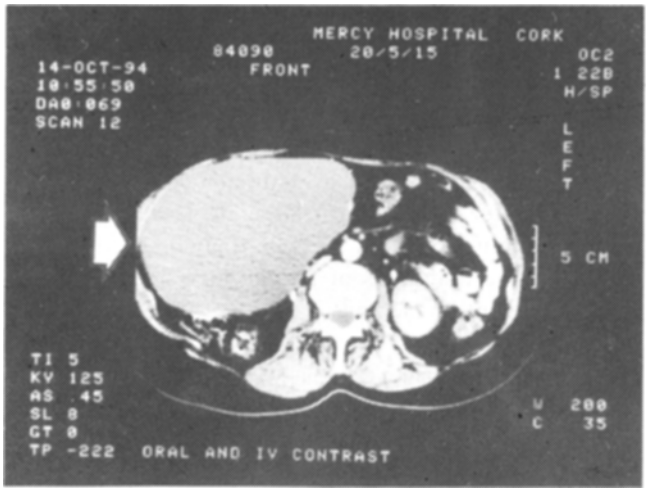

Fig. 3 – Barium meal (from case 5): duodenum displaced (arrowhead) to the left by a soft tissue mass.

the majority of remaining cases[11], as was found in our series. A retroperitoneal cyst is occasionally observed (<5 per cent of cases) which may indicate isolation of this segment during embryonic life[14].

The fluid within the cyst may be serous, chylous, bloody or mixed[6]. It may be thick with a white cheesy consistency that is thought to be a result of inspissated lymph. Serous cysts are characterised by a clear, straw coloured fluid of low specific gravity whose chemical composition resembles plasma[15]. These are found mainly in the mesocolon in contrast to chylous cysts, which are usually situated in the mesentery of the small intestine. Chylous cysts contain a higher proportion of lipid in keeping with their lymphatic origin[15].

Most possess a cuboidal or columnar epithelial lining with an absence of atypical morphlogy[16]. The epithelial lining may be destroyed by increasing of cyst contents. In these cases the cyst wall contains fibrocollagenous tissue infiltrated with chronic inflammatory cells. Mesenteric cysts may be differentiated from cystic lymphangiomas by their lack of lymphoid or smooth muscle tissue[16]. This is a complex structure that suggests a regulatory function, perhaps electrolyte homeostasis of the fluid environment.

Clinical features

The presentation of mesenteric cysts is variable, depending upon the size, location and the presence or absence of complications. It may be an incidental clinical or radiological finding (case 4), or can present with acute or chronic symptoms. The commonest symptoms in the acute setting are abdominal pain and distension (cases 5 and 6), anorexia, nausea, vomiting and malaise. The chronic presentation as in cases 1 and 2 is of progressive abdominal distension and discomfort, constipation, poor appetite and weight loss. Therefore, a malignant tumour is often suspected.

Acute or acute on chronic intermittent central abdominal pain is the most prominent feature seen in 4 of our cases. Pain may be due to infection or torsion of the cyst, haemorrhage into the cyst (cases 2 and 6), stretching of the mesentery, or compression of surrounding structures[11,15] (case 3). Subacute or absolute bowel obstruction can occur as a result of local pressure (case 5), or less often due to volvulus of the mesentery around the axis of the cyst[15]. Presentation of mesenteric cysts in children is frequently acute[15] (case 6). This is thought to be due to rapid cystic enlargement in a confined intra-abdominal cavity. The cysts tend to be the same size as those in adults at presentation, therefore causing a greater degree of obstruction[1]. Case 3 presented interestingly in an atypical form, as compression usually occurs on surrounding bowel and not vessels.

Examination may reveal an abdominal mass which is mobile only in the transverse plane as opposed to omental cysts that are mobile in all directions[17,18]. The patient may be pyrexial and, in the chronic case, anaemia and weight loss may feature. As a rule, there are no signs outside the abdomen.

Management

Laboratory studies are largely unhelpful, but may confirm anaemia or demonstrate an obstructive uropathy (case 4). A calcified mass or displacement of bowel gas patterns may be visualised on plain abdominal radiographs[19]. Upper or lower gastrointestinal contrast studies may show an extrinsic mass effect with normal mucosa thereby excluding intrinsic lesions[19] (case 5). Historically visceral angiography was employed to establish the mass as within the leaves of the mesentery[17,20]. Such invasive diagnostic methods have been made obsolete by ultrasound. Ultrasound scanning is very useful in the demonstration of cystic structures as it enables accurate visualisation of septations and fluid levels[21]. It also reveals the content of the cyst (debris etc.) and permits percutaneous biopsy under guidance[10]. Computed tomography (CT) may offer extra information as to the nature of the fluid through demonstration of negative numbers that indicate fatty lymph[19,22,23]. The presence of an enhancing wall is helpful in characterising a lesion as either a pseudocyst or an enteric duplication cyst, thus differentiating them from the thin walled mesenteric cyst[19]. Magnetic resonance imaging (MRI) offers multiplanar capabilities and therefore may be useful in determining the precise location of the cyst[19,20]. The increased sensitivity of MRI in detection of haemorrhage and fat using T1 and T2-weighted imaging is also helpful[19].

The differential diagnosis includes teratoma of the mesentery, cystic smooth muscle tumours and cystic mesothelioma[19]. CT will differentiate teratomas of the mesentery which are cystic with peripheral calcification but do contain complex fat accumulations[24]. Smooth muscle tumours can occasionally become cystic due to stromal degeneration or tumour necrosis. They may be radiologically indistinguishable from mesenteric cysts[25]. Cystic mesotheliomas are multiocular and classically occur in middle-aged females. They are also difficult to distinguish from cysts of the mesentery with imaging alone[26].

A substantial overlap exists in the imaging findings, the major role of radiological investigations is to demonstrate the cystic nature and anatomical site of the mass and to provide evidence of the pathological diagnosis[19]. In one series, ultrasound was found to be more accurate than CT or MRI for diagnosis of mesenteric cysts[23]. It is cheaper, faster, safer, and more accessible than CT or MRI and is recommended as the imaging modality of choice in the initial investigation[23].

Treatment invariably involves surgical intervention - be it simple drainage, resection or marsupialisation. As a rule, drainage is not recommended because the cyst tends to re-accumulate (case 3) and marsupialisation is not acceptable because of the risk of infection and/or re-operation for persistently draining sinus[10]. Full excision of the cyst with or without its mesenteric origin should be the aim of surgery because recurrence is uncommon following total resection[15,17]. Localised resection of intestine, which may be necessary to excise the cyst in-

toto (cases 3 and 6), does not significantly alter morbidty[15]. Patients with lymphangiomas are more likely to require bowel resection than those with other forms of mesenteric cysts[19].

Minimal access techniques have been widely introduced into surgical practice. Laparoscopy provides visualisation of the peritoneal cavity and retroperitoneal space and should prove to be the diagnostic procedure of choice in cases that remain unclear (case 3). Accurate anatomical, structural and pathological assessment of the cyst can be made rapidly. Successful laparoscopic excision of mesenteric cysts have been reported[27-29]. This technique may become an attractive option for surgical intervention in experienced hands.

Conclusion

The aetiology of mesenteric cysts is ill-defined and the ideal management has yet to be determined. Ultrasound is the preferred imaging tool at the onset of investigation, with computed tomography and magnetic resonance imaging adding advantages in localisation and anatomical definition. The cyst must be distinguished from malignant masses that possess a cystic appearance. Complete excision is the aim of treatment and this should involve resection of attached bowel if necessary. Minimal access surgery is a useful option, particularly where there is little adherence to surrounding structures.

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