**Mesenteric Abnormalities**

**LEARNING OBJECTIVES**

1. List diagnostic considerations for diffuse and multifocal mesenteric abnormalities.
2. Identify mesenteric adenitis on US and CT.
3. Generate a differential diagnosis for mesenteric cysts.

**INTRODUCTION**

The mesentery is a dual layer of peritoneum that suspends the small and large bowel from the posterior abdominal wall. It is fan- or cone-shaped, originating from the superior–central abdomen and radiating inferiorly and peripherally. Mesenteric abnormalities may be divided into focal, multifocal, and diffuse processes. Focal mesenteric lesions are described in the sections below. Diffuse mesenteric pathologies include edema, inflammation, and hemorrhage. These processes typically replace the normal mesenteric fat with soft tissue attenuation on CT, creating a “misty mesentery” appearance, and cause increased echogenicity on US (Fig. 17.1). They also may displace bowel peripherally or encase the superior mesenteric vessels. Multifocal mesenteric masses most often represent lymphadenopathy. Primary diagnostic considerations for mesenteric lymphadenopathy are non-Hodgkin lymphoma, metastatic disease, and infection (Fig. 17.2).1

**MESENTERIC ADENITIS**

Mesenteric adenitis represents benign nodal enlargement from an underlying viral or bacterial infection. Common bacterial agents include *Yersinia enterocolitica* and *Streptococcus*. In most cases, the terminal ileum is the likely site of infection.1 Presenting signs and symptoms include fever, emesis, leukocytosis, and right lower abdominal pain. Clinically distinguishing mesenteric adenitis from acute appendicitis is challenging, allowing imaging to play an important role in the diagnostic workup.4-7

US and CT are the most common modalities for imaging mesenteric adenitis (Figs. 17.3 and 17.4). CT offers a more sensitive and specific evaluation of mesenteric processes, but involves ionizing radiation. There is no clear consensus regarding the normal size of mesenteric lymph nodes in children. Most authors report that a cluster of 3 or more mesenteric lymph nodes with short-axis diameters exceeding 5 mm is required to make this diagnosis.
However, others believe that enlarged mesenteric lymph nodes in a child with abdominal pain are a relatively nonspecific finding and that these criteria allow for significant overlap between mesenteric adenitis and normal nodes.\textsuperscript{3,10} For example, Karmazyn et al.\textsuperscript{10} reported that using a cluster of 3 or more lymph nodes, each with 8-mm diameters, would be more appropriate to diagnose mesenteric adenitis by CT. The enlarged nodes are most often located in the right abdomen anterior to the psoas muscle.\textsuperscript{1,4} Associated mild ileal or colonic wall thickening may be seen in up to one-third of cases, particularly in children less than 5 years old.\textsuperscript{3,11} Before arriving at a diagnosis of mesenteric adenitis, it is critical to exclude acute appendicitis as a cause for abdominal pain.

Treatment of mesenteric adenitis is typically supportive care only, as the clinical course is benign and self-limited. Antibiotics are considered for moderately or severely ill children with suspected bacterial enterocolitis.

**FIG. 17.2** Mesenteric lymphadenopathy in an 18-year-old female with non-Hodgkin lymphoma. Coronal (A) and sagittal (B) reformatted images from a contrast-enhanced CT demonstrate lymphadenopathy within the mesentery (yellow arrows in both A and B), bilateral axilla (blue arrows in A), and the left neck (orange arrow in A).

**FIG. 17.3** Mesenteric adenitis by ultrasound in a 2-year-old female with right lower quadrant abdominal pain. Focused abdominal sonography reveals a cluster of three round hypoechoic mesenteric lymph nodes with short axes of 6 to 7 mm.

**FIG. 17.4** Mesenteric adenitis by CT in an 11-year-old female with right lower abdominal pain. Axial (A) and coronal (B) images from a contrast-enhanced CT illustrate several enlarged mesenteric lymph nodes in the right lower abdomen (yellow arrows in both A and B). Note the normal appendix (blue arrow in A).
Mesenteric cysts are rare intra-abdominal lesions typically seen in neonates and young children less than 5 years old. They are most common within the small bowel mesentery though they may be situated anywhere along the gastrointestinal tract. Histologically, they are benign cystic proliferations of lymphatic tissue. Presenting symptoms include abdominal pain or palpable mass. Mesenteric lymphatic malformations are more frequently invasive and multilocular compared to simple cysts, though both are derived from dysplastic lymphatic channels. Mesenteric cysts have a nonspecific appearance on all modalities and may have septations, internal debris, or blood products (Fig. 17.5).

Differential diagnostic considerations for a mesenteric cyst include enteric duplication cyst, ovarian cyst, pancreatic pseudocyst, and Meckel diverticulum (Table 17.1). Cystic malignancies are also possible but less likely. Mesenteric cysts are surgically resected, occasionally with segmental resection of adjacent small bowel, with an excellent long-term prognosis.

Solid tumors arising from the pediatric mesentery are also rare. They range from benign entities such as lipomas, mature teratomas, and hamartomas to malignancies including immature germ cell tumors and sarcomas (Fig. 17.6). Lesions may be asymptomatic or cause vague abdominal pain and distension. Painful presentations may result from tumor hemorrhage, torsion, or metastatic disease (Fig. 17.7). Treatment of primary mesenteric tumors usually involves surgical resection along with chemotherapy and radiation for malignant lesions.

**Table 17.1** DIFFERENTIAL DIAGNOSIS FOR MESENTERIC CYST

- Mesenteric cyst
- Enteric duplication cyst
- Ovarian cyst
- Pancreatic pseudocyst
- Meckel diverticulum

**FIG. 17.5** Mesenteric cyst in a 16-year-old female. Longitudinal (left) and transverse US images of the pelvis depict an ovoid cyst posterior and to the right of the cervix. The structure is distinct from the right ovary (not shown). The cyst is primarily anechoic with scattered hypoechoic septations.

**FIG. 17.6** Posttransplant lymphoproliferative disorder (PTLD) of the mesentery in a 6-year-old male. Axial (A) and coronal (B) contrast-enhanced CT images show a lobular, homogeneously hypodense mass (arrowheads in A) encasing the superior mesenteric vessels (arrow in A and B).

**FIG. 17.7** Torsion of a mesenteric lipoma in a 14-year-old male presenting with acute lower abdominal pain. A: Right pelvic US image illustrates a lobular echogenic mass where the patient was exquisitely tender. B: Axial contrast-enhanced CT image demonstrates a well-defined, septated, fat-containing mass with surrounding edema (white arrows).
Take Home Points: Mesenteric Adenitis

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<th>Mesenteric adenitis</th>
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<td>• Benign nodal enlargement from viral or bacterial infection, often of terminal ileum</td>
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<td>• May mimic appendicitis clinically</td>
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<td>• US or CT: cluster of 3 or more mesenteric nodes each with short axes &gt;5 mm by US or &gt;8 mm by CT</td>
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<td>• Usually in right lower abdomen</td>
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<td>• Treatment—benign, self-limited</td>
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References

CHAPTER SELF-ASSESSMENT QUESTIONS

1. Which of the following conditions is the most common clinical differential consideration for mesenteric adenitis?
   A. Malrotation
   B. Necrotizing enterocolitis
   C. Inflammatory bowel disease
   D. Appendicitis

2. Which of the following imaging features would be most suggestive of a mesenteric tumor?
   A. Fat attenuation
   B. No discernible organ of origin
   C. Claw sign
   D. Aortic encasement

Answers to Chapter Self-Assessment Questions

1. D Acute appendicitis is the most important differential consideration for mesenteric adenitis. The clinical presentations are often indistinguishable, including fever, leukocytosis, and right lower abdominal pain. Appendicitis should be excluded by imaging before a diagnosis of mesenteric adenitis is made.

2. B When an abdominal mass shows no clear organ of origin, a primary mesenteric tumor should be suspected. Fat attenuation and aortic encasement may be seen with mesenteric tumors but are nonspecific findings. The “claw sign” refers to tissue extending along the margins of a mass, suggesting that the mass arises from this parenchymal organ. For example, Wilms tumor often exhibits a renal claw sign.