Aneurysmal dilatation of retroperitoneal lymphatic trunk
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Section: Abdominal imaging
Area of Interest: Anatomy Lymphatic
Procedure: Diagnostic procedure
Imaging Technique: CT
Imaging Technique: MR
Special Focus: Congenital Dilatation Case Type: Clinical Cases
Authors: Tonolini Massimo, Francesca Rigiroli
Patient: 41 years, female

Clinical History:

Middle-aged woman with history of gastro-oesophageal reflux, admitted to emergency department because of recurrent crampy abdominal pain, nausea, reduced food intake and 5-kg weight loss during the past three months. Physical examination was unremarkable, routine laboratory tests (including acute phase reactants) within normal limits apart from increased serum lipase (480 U/l).

Imaging Findings:

Performed to investigate clinical diagnosis of acute pancreatitis, CT (Figs. 1, 2) showed occupation of the left para-aortic retroperitoneal space by a well-demarcated, ovoid-shaped fluid-attenuation expansile lesion, without contrast-enhancement and signs of invasion. The pancreas did not show significant enlargement, necrotic areas, or abnormal collections. Continuation between the main pancreatic and Santorini duct consistent with pancreas divisum was noted. She was treated medically with prompt clinical and biochemical improvement. A week later, MRI with MRCP (Fig. 3) confirmed pancreas divisum underlying acute pancreatitis, excluded cholelithiasis, and showed the retroperitoneal expansile lesion with cyst-like homogeneous signal, measuring 6 cm in length from lower L1 to upper L3 vertebrae, in communication with the retroperitoneal lymphatic system. Subsequently, at another institution she underwent Positron Emission Tomography (not shown), which failed to disclose 18-fluorodeoxyglucose abnormal uptake. A year and half later, the lesion appeared unchanged on urgent aortic CT-angiography performed to exclude dissection (Fig. 4).

Discussion:

The complex retroperitoneal lymphatic system (RLS) is characterised by several anatomic variants. Continuing upwards from the iliac lymphatics, the lumbar lymphatics drain lymph from lower limbs, pelvis, kidneys, adrenals and abdominal wall, and ascend on either side of the aorta as right and left main trunks, that join the intestinal lymphatic trunk in the cisterna chyli (CC). Well known from anatomical studies, the CC is a dilated lymphatic sac located in the retrocruural space at the T11-L1 vertebral level, usually just to the right side of the aorta. Increasingly referred to as “abdominal confluence of the lymphatic trunks”, the CC continues cranially through the aortic diaphragmatic hiatus in the thoracic duct, that drains lymph into the venous circulation [1, 2]. Currently noncontrast MR-lymphography (MR-LY) is considered the best technique for non-invasive assessment of normal anatomy and abnormalities of the RLS, using heavily T2-weighted sequences (such as in MR-
cholangiopancreatography) to visualize static fluid in the lymphatic vessels with suppressed background signal [1, 2]. Identifiable in 15% of abdominal MRI studies, the CC is a variable-sized fluid-filled (5-12 Hounsfield Units attenuation) structure posterior to the diaphragmatic crus, sometimes oval, fusiform, or plexiform but most commonly tubular or sausage-shaped, usually 1-2 cm wide, up to 5 cm in length. At MR-LY, the usual RLS appearance includes a meshwork of tubular, tortuous, fluid-filled periaortic structures. Occasionally, aneurysmal dilatation of the RLS may occur, including variable dilatation of CC, right, left, or both lumbar trunks as lobulated lesions with homogeneous fluid content and occasional haemorrhagic debris, which are most commonly unilateral. As this case exemplifies, the key to the diagnosis of RLS aneurysmal dilatation couples the characteristic alternating bands of constriction (corresponding to lymphatic valves) and dilatation, with the identification of communication with retroperitoneal lymphatic vessels [1-5].

At cross-sectional imaging, dilated retroperitoneal lymphatic structures may be misinterpreted as enlarged or confluent hypoattenuating lymph nodes. The other important differential diagnosis is retroperitoneal cystic lymphangioma, which represents the end of the spectrum of RLS abnormalities and is a multilocular cystic lesion with infiltrative or convex margins, sometimes bulky with mass effect or involving multiple retroperitoneal compartments [1, 2, 5]. Although in most cases contrast medium is unnecessary to confirm the lymphatic nature of dilated retroperitoneal channels versus lymphadenopathy, intravenous gadolinium contrast may show absent enhancement in the CC within the first 5 minutes after injection, progressive delayed enhancement with fluid-contrast level after 10-30 minutes, uniform opacification 4 hours later [6, 7].

**Differential Diagnosis List:** Aneurysmal dilatation of left-sided retroperitoneal lymphatic trunk, Retroperitoneal lymphadenopathy, Cystic lymphangioma, Retroperitoneal tumour e.g. sarcoma, Retroperitoneal haematoma, Retroperitoneal fibrosis, Inflammatory /Infectious aortitis, Paraspinal abscess, Retroperitoneal oedema / effusion

**Final Diagnosis:** Aneurysmal dilatation of left-sided retroperitoneal lymphatic trunk

**References:**


Description: As the only abnormality, unenhanced images (a...e in cranio-caudal order) show occupation of the left para-aortic retroperitoneal space by a well-demarcated, ovoid-shaped fluid-attenuation expansile lesion (arrows). Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
Description: Detailed unenhanced images show occupation of the left para-aortic retroperitoneal space by a well-demarcated, ovoid-shaped fluid-attenuation expansile lesion (arrows) without significant mass effect. **Origin:** Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
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Description: After contrast, the pancreas does not show significant enlargement, necrotic areas, nor abnormal collections.

The moderately dilated main pancreatic duct (arrowhead) continues with the Santorini duct (arrowheads in b&c). Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
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The moderately dilated main pancreatic duct continues with the Santorini duct (arrowhead). **Origin:** Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
Description: The moderately dilated main pancreatic duct continues with the Santorini duct (arrowhead), indicating pancreas divisum. Axial enhanced images (c...e in craniocaudal order) confirm left retroperitoneal cystic-like expansile lesion (arrows) without contrast-enhancement. Origin: Tonolini Massimo, Department of Radiology, "Luigi Sacco" University Hospital – Milan (Italy)
Description: Detail axial enhanced images confirm left retroperitoneal cystic-like expansile lesion (arrows) without contrast-enhancement (arrows) and signs of vascular or psoas muscle invasion.

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**Origin:** Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
**Description:** Coronal reformatted images (f, detail in g) show the entire cranio-caudal extent of the well-demarcated retroperitoneal cystic-like lesion (arrows). No other abnormal findings in the abdomen and pelvis. **Origin:** Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
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Description: Axial T2-weighted images (a-e in cranio-caudal order) confirm the left retroperitoneal expansile lesion (arrows) with homogeneous fluid-like hyperintense signal. Origin: Tonolini Massimo, Department of Radiology, “Luigi Sacco” University Hospital – Milan (Italy)
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Description: Thick-slab MRCP image excludes cholelithiasis, and confirms pancreas divisum with continuation between Santorini and main pancreatic duct (arrowheads). Origin: Tonolini Massimo, Department of Radiology, ‘Luigi Sacco’ University Hospital – Milan (Italy)
Description: Different oblique MIP projection images from thin-slab MRCP acquisition show the entire size and shape of the cystic-like lesion (+), with lobulated contours, hyperintense fluid-like content, and communication with the retroperitoneal lymphatic system (arrows). Origin: Tonolini Massimo, Department of Radiology, "Luigi Sacco" University Hospital – Milan (Italy)
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