Case 10626

Thoracic and abdominal Burkitt lymphoma
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Section: Paediatric radiology
Area of Interest: Paediatric Kidney Pelvis Thorax
Procedure: Diagnostic procedure
Imaging Technique: Ultrasound
Imaging Technique: Ultrasound-Colour Doppler
Imaging Technique: CT
Special Focus: Lymphoma Case Type: Clinical Cases
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Patient: 11 years, female

Clinical History:

An 11-year-old girl was referred to our institution because of diffuse abdominal pain, nausea, disuria and urinary frequency for 5 days. At physical examination there was a painful abdominal palpation, tenderness of the inferior abdominal quadrants and positive right renal Murphy sign.

Imaging Findings:

An abdominal ultrasound was performed, followed by a thoracic, abdominal and pelvic CT study that showed (figure 1-11):
- Right pleural fluid
- Peritoneal fluid
- Homogeneous hypodense lobulated mass involving the right diaphragmatic hemicupula and extending inferiorly with bulging of the hepatic contour
- Nodular thickening of the greater omentum, parietal peritoneum in the paracolic gutters with mass effect confining the bowel loops to the central portion of the abdomen
- In the pelvis there was a mass compressing the bowel loops, uterus and producing bilateral hydronephrosis
- Increased echogenicity of the right kidney at ultrasound and diminished contrast enhancement at CT study
- Bulky ovaries, without expansive masses
- Increased size of the ileocecal appendix (10 mm)

Elevated LDH and uric acid were the only positive analytic findings.
A laparoscopy was performed and mass biopsy revealed a Burkitt lymphoma.
An osseous biopsy was also performed and did not reveal lymphomatous involvement.

Discussion:

Burkitt lymphoma is one of the most common subtypes of B-cell non-Hodgkin lymphoma in children. It has a rapid growth rate, with most cases showing diffuse disease at the time of the diagnosis.
There are two varieties of the disease, one that happens in some parts of Africa and affects the jaw of children and is associated with Epstein-Barr virus. The other is the North American variety that frequently occurs intra-abdominally.

In the abdomen, the distal ileum, caecum and appendix are the most involved regions. The retroperitoneum,
abdominal and pelvic lymph nodes and ovaries may also be affected. The ovaries can manifest by the presence of a mass that sometimes engulf the pelvic organs. Peritoneal and omental involvement is not common, though when present suggests disseminated disease.

In children, the manifestation of lymphoma is more often extra-nodal, and commonly abdominal and intrathoracic organs are affected. Acute abdominal symptoms (abdominal pain, vomiting, mass, intussusception, weight loss) are a common manifestation of Burkitt lymphoma in children, sometimes suggesting an acute appendicitis. Ascites and pleural effusion may be present.

The main objective of imaging studies is to evaluate the extension and anatomical involvement in order to stage the disease.

Ultrasound is important in the initial evaluation of abdominal lymphoma detecting abdominal superficial lymph nodes and parenchymatous organs compromise. As it does not require radiation exposure it is well suited for study of paediatric patients.

Chest radiographs can provide information about the extension of intrathoracic disease but Computed Tomography (CT) is much more sensitive.

CT utilising IV contrast is the imaging method of choice to evaluate thoracic and abdominal disease. It can be used to define the extension of the disease and follow-up by monitoring the response to therapy and access relapses. It can show hepatosplenomegaly, hypodense focal lesions with low enhancement in the solid organs, and conglomerate of abdominal and pelvic lymphadenopathies.

Magnetic resonance does not give more information than CT study; however, it is useful when evaluating central nervous system involvement, not commonly seen in children.

Gallium 67 scintigraphy can provide a whole-body screen in Burkitt lymphoma and can be used both as a diagnostic and follow-up modality.

The definitive diagnosis of lymphoma requires a histological analysis.

Chemotherapy is the treatment of choice. Monitoring tumour response to treatment is important and either CT or MR may be used for this.

Ileum, caecum and appendix are frequently affected by Burkitt lymphoma. When peritoneal involvement such as omental cake is present, Burkitt lymphoma should be in the differential diagnostic list.

**Differential Diagnosis List:** Thoracic and abdominal Burkitt lymphoma, Peritoneal carcinomatosis, Peritoneal tuberculosis

**Final Diagnosis:** Thoracic and abdominal Burkitt lymphoma

**References:**


Description: Sonography study demonstrated a right pleural effusion. Origin: Batista L, Department of Radiology, Hospital Pediátrico de Coimbra- CHUC, Coimbra, Portugal
**Figure 2**

Description: Abdominal ultrasound demonstrated hydronephrosis. **Origin:** Batista L, Department of Radiology, Hospital Pediátrico de Coimbra - CHUC, Coimbra, Portugal
Figure 3

Description: Ultrasound showed an enlarged ileocecal appendix. Origin: Batista L, Department of Radiology, Hospital Pediátrico de Coimbra - CHUC, Coimbra, Portugal
Description: Ultrasound demonstrated thickening of the greater omentum. Origin: Batista L, Department of Radiology, Hospital Pediátrico de Coimbra - CHUC, Coimbra, Portugal
Description: Ultrasound showed nodular thickening of the parietal peritoneum in the paracolic gutters and pelvis with mass effect. Origin: Batista L, Department of Radiology, Hospital Pediátrico de Coimbra - CHUC, Coimbra, Portugal
Description: Ultrasound showed nodular thickening of the greater omentum and parietal peritoneum in the paracolic gutters and pelvis. Origin: Batista L, Department of Radiology, Hospital Pediátrico de Coimbra - CHUC, Coimbra, Portugal
Description: The ovaries were enlarged but without expansive masses in the sonography. Ascites was also present. Origin: Batista L, Department of Radiology, Hospital Pediátrico de Coimbra - CHUC, Coimbra, Portugal
Description: Solid masses were present within the pelvis with marked vascularity. Origin: Batista L, Department of Radiology, Hospital Pediátrico de Coimbra - CHUC, Coimbra, Portugal
Description: Contrast-enhanced axial CT study showed the lobulated mass involving the right diaphragmatic hemicupula and causing bulging of the hepatic contour. Right pleural effusion and ascites can also be seen. Origin: Batista L, Department of Radiology, Hospital Pediátrico de Coimbra - CHUC, Coimbra, Portugal
**Description:** Axial contrast-enhanced CT showed the peritoneal fluid, the nodular thickening of the parietal peritoneum and bilateral hydronephrosis. The kidneys demonstrated reduced contrast enhancement due to obstructing hydronephrosis. **Origin:** Batista L, Department of Radiology, Hospital Pediátrico de Coimbra - CHUC, Coimbra, Portugal
Description: Axial contrast-enhanced CT study demonstrated thickening of the bowel wall in the pelvis and mass that compresses the bowel loops, bladder and uterus. Origin: Batista L, Department of Radiology, Hospital Pediátrico de Coimbra - CHUC, Coimbra, Portugal