

## An unusual case of paediatric Burkitt's lymphoma (ECR 2013 Case of the Day)

Published on 25.11.2013

**DOI:** 10.1594/EURORAD/CASE.11421

**ISSN:** 1563-4086

**Section:** Paediatric radiology

**Area of Interest:** Abdomen Kidney Pancreas Head and neck

**Procedure:** Diagnostic procedure

**Imaging Technique:** CT

**Imaging Technique:** Ultrasound

**Imaging Technique:** Ultrasound-Colour Doppler

**Special Focus:** Lymphoma Leukaemia Case Type: Clinical Cases

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**Patient:** 4 years, female

### Clinical History:

A 4-year-old girl with no significant past medical history presented with a three-week history of pelvic distension and abdominal pain. Physical examination revealed a palpable mass in the left iliac fossa. Her parents also reported recent-onset of slight right-eye convergent strabismus. Ophthalmological examination revealed no abnormal pupillary reactions or proptosis.

### Imaging Findings:

The patient underwent ultrasound (US) examination of the abdomen that showed two hypoechoic solid masses (Fig. 1a, 1b), with intralesional hypervascularisation at Doppler (Fig. 1c), localised in the right side of the pelvis and in the left iliac fossa and bilateral renal lesions with the same appearance (Fig. 1d, 1e). Ovaries could not be identified. CT study demonstrated bilateral ovarian masses (Fig. 2a, 2b) homogeneously hypodense and multiple solid lesions involving kidneys bilaterally and pancreas (Fig. 2c, 2d) with similar attenuation characteristics, associated with enlarged para-aortic and intercavo-aortic lymph nodes. CT scan of the head showed a soft-tissue mass with homogeneous enhancement after contrast medium, affecting the sphenoid sinus, the anterior ethmoidal cells and rhinopharyngeal roof, with partial osteolysis of surrounding bones (Fig. 2e). Cerebrospinal fluid and bone marrow examination did not appear abnormal. Laboratory evaluation demonstrated only an elevated lactate dehydrogenase level.

### Discussion:

Burkitt's lymphoma is a high-grade B-cells lymphoma, affecting predominantly children, which can be classified in immunodeficiency-associated, endemic and sporadic forms [1]. The immunodeficiency-associated form occurs mainly in patients with HIV. The endemic form is associated with the Epstein-Barr virus (EBV) in 95% of the cases and jaw involvement is the most common manifestation. The sporadic form is rarely associated with EBV. The abdomen is especially involved in the sporadic form, while the leocaecal area is the most common site but the ovaries, kidneys, omentum and Waldeyer's ring may also be involved [2]. As in our patient, the initial clinical manifestation is often a palpable abdominal mass; in these cases ultrasound is the primary imaging modality of

choice. However, because ultrasound does not always permit adequate visualisation of intra-abdominal structures due to the overlying bone or bowel gas, CT remains the gold standard modality for staging and follow-up of children with Burkitt's lymphoma. MR imaging is the best choice for the evaluation of lymphomatous involvement of the central nervous system (CNS). Definitive diagnosis of this disease is based on histologic, cytogenetic, and immunophenotypic features [3].

In our case, Burkitt's lymphoma presented as bilateral ovarian solid masses with similar lesions in the kidneys and pancreas, associated with sphenoid soft tissue.

Ovarian involvement by Burkitt's lymphoma may be primary or secondary, but is considered almost always part of a widely disseminated disease [4]. Primary malignant tumours of ovaries in children are rare. Among these, dysgerminomas are the most common primary neoplasms. At imaging, they appear as solid mass with internal fibrovascular septa [5]. Distant metastases are rare and bilateral ovarian involvement occurs only in 10%. Indeed, bilaterality of ovarian solid lesions is often a clue of their metastatic nature. Among the childhood neoplasms that spread to ovaries, rhabdomyosarcoma and neuroblastoma are the most frequent. The radiologic appearance generally includes heterogeneous soft-tissue masses with calcifications, even if these characteristics are not specific for these entities. Finally, it is important to consider lymphoblastic lymphoma in the differential diagnosis of Burkitt's lymphoma, because both lymphomas can involve gonads, CNS, gastroenteric tract and paranasal sinus. Nevertheless, in lymphoblastic lymphoma a primary supradiaphragmatic involvement is most frequent [6]. In conclusion, when an ovarian solid mass lesion is detected with accompanying lesions out of the pelvis in the paediatric age population, Burkitt's lymphoma must be taken into consideration in the differential diagnoses. Early diagnosis and treatment are important for survival in lymphoma patients.

**Differential Diagnosis List:** Biopsy of ovarian masses indicated a Burkitt's lymphoma., Rhabdomyosarcoma, Neuroblastoma, Lymphoblastic lymphoma, Dysgerminoma

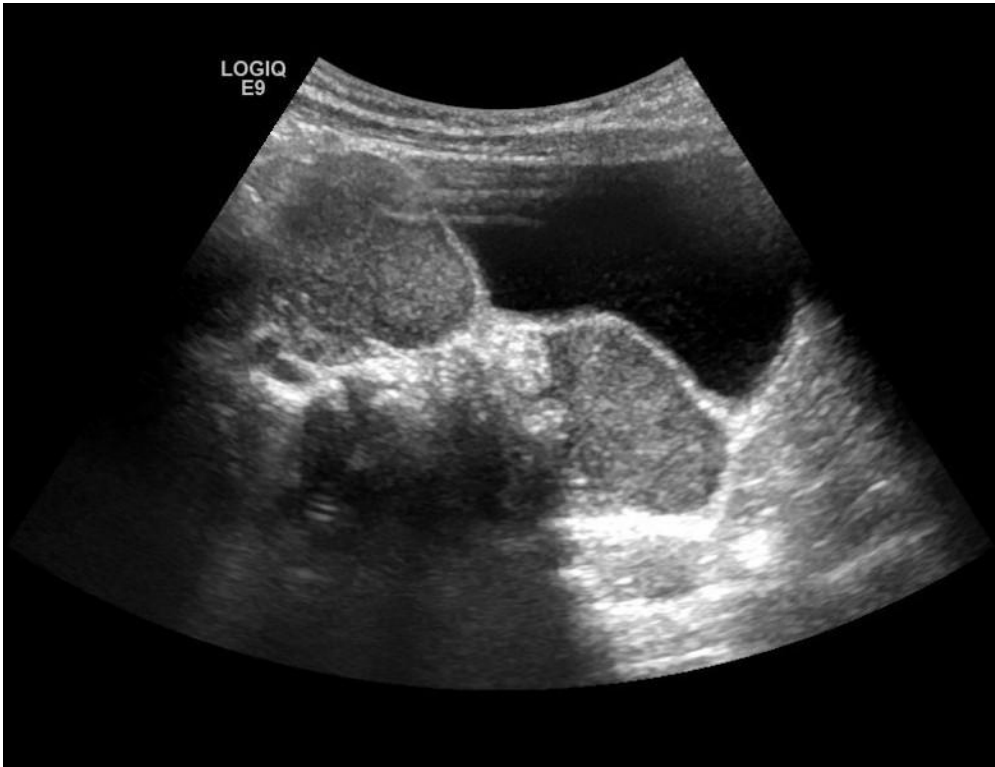
**Final Diagnosis:** Biopsy of ovarian masses indicated a Burkitt's lymphoma.

## References:

- Ferry JA. (2006) Burkitt's lymphoma: clinicopathologic features and differential diagnosis. *Oncologist* 11:375–383 (PMID: [16614233](#))
- Hamrick-Turner JE, Saif MF, Powers CI, Blumenthal BI, Royal SA, Iyer RV. (1994) Imaging of childhood non-Hodgkin lymphoma: assessment by histologic subtype. *Radiographics* 14:11–28 (PMID: [8128042](#))
- Biko DM, Anupindi SA, Hernandez A, Kersun L, Bellah R. (2009) Childhood Burkitt lymphoma: abdominal and pelvic imaging findings. *Am J Roentgenol* 192:1304-15 (PMID: [19380555](#))
- Gutiérrez-García L, Medina Ramos N, García Rodríguez R, Barber MA, Arias MD, García JA. (2009) Bilateral ovarian Burkitt's lymphoma. *Eur J Gynaecol Oncol* 30:231-3 (PMID: [19480266](#))
- Epelman M, Chikwava KR, Chauvin N, Servaes S. (2011) Imaging of pediatric ovarian neoplasms. *Pediatr Radiol* 41:1085–1099 (PMID: [21567140](#))
- McCarville MB, Hill DA, Miller BE, Pratt CB. (2001) Secondary ovarian neoplasms in children: imaging features with histopathologic correlation. *Pediatr Radiol* 31:358-64 (PMID: [11373927](#))

**Figure 1**

a



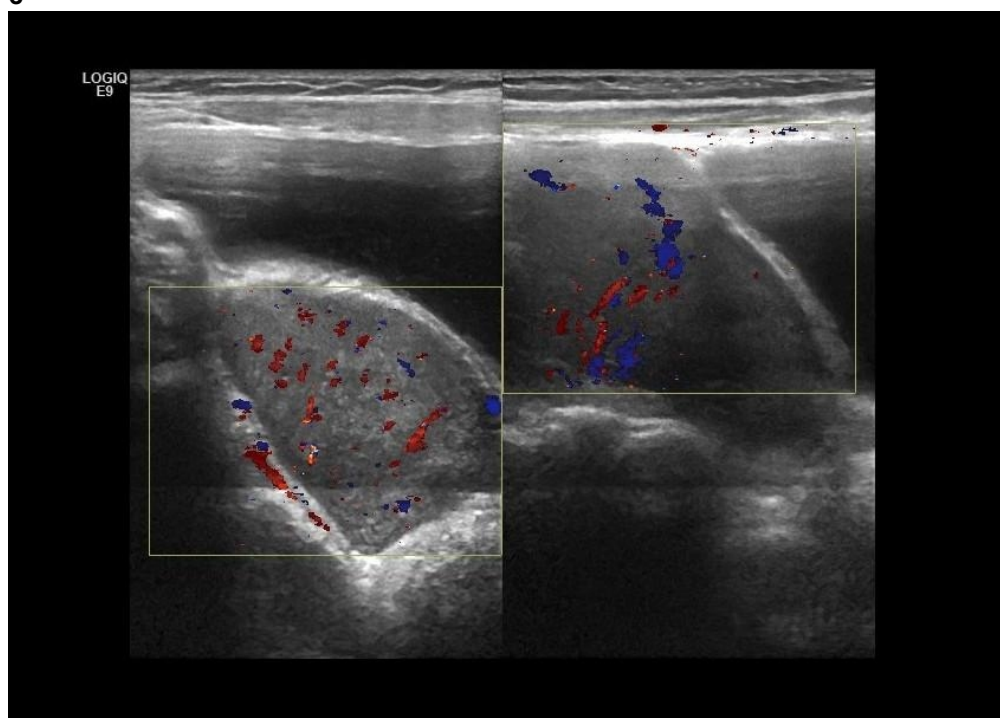
**Description:** On longitudinal B-mode US, two hypoechoic solid mass lesions are seen posterior to bladder, in the right side of the pelvis and in the left iliac fossa. **Origin:** Department of Bio-Imaging and Radiological Sciences, Catholic University, Policlinic "A. Gemelli", Rome, Italy

**b**



**Description:** Transverse B-mode US, showing the solid lesion localized in left iliac fossa. **Origin:** Department of Bio-Imaging and Radiological Sciences, Catholic University, Policlinic "A. Gemelli", Rome, Italy

**c**



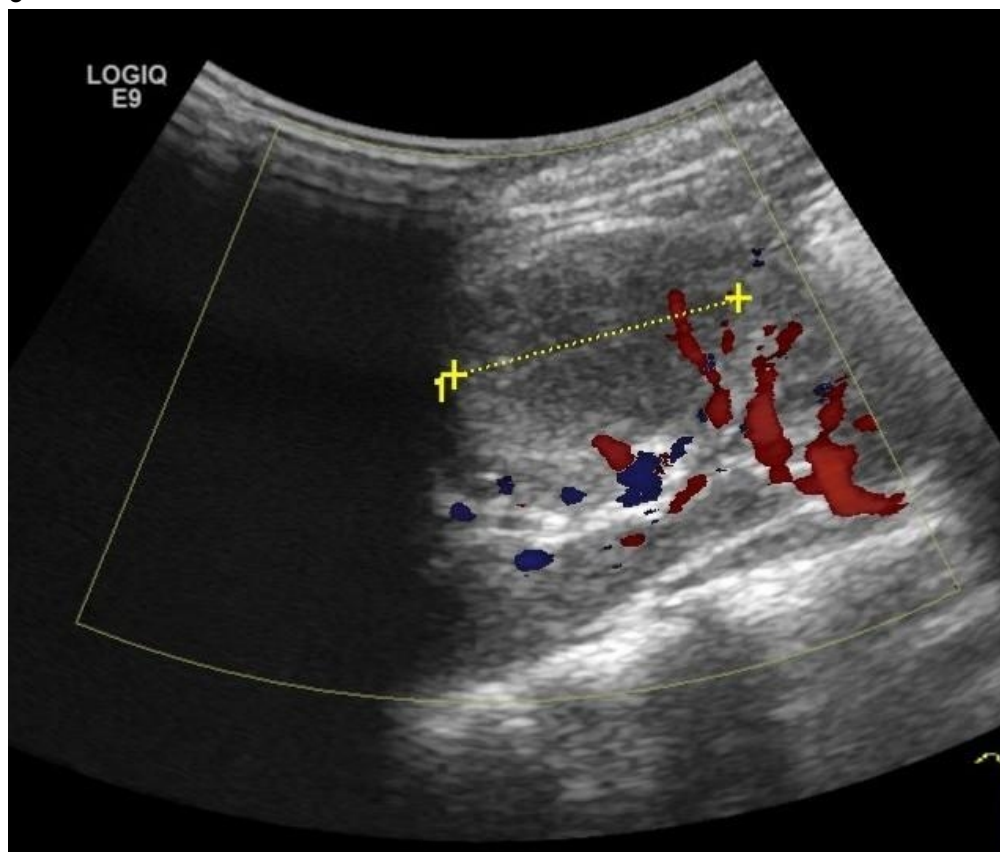
**Description:** At colour Doppler, the solid lesions, localised in pelvis and left iliac fossa, present intralesional hypervascularisation. **Origin:** Department of Bio-Imaging and Radiological Sciences, Catholic University, Policlinic "A. Gemelli", Rome, Italy

**d**



**Description:** Longitudinal B-mode US, showing a solid lesion localised in the right kidney. **Origin:** Department of Bio-Imaging and Radiological Sciences, Catholic University, Policlinic "A. Gemelli", Rome, Italy

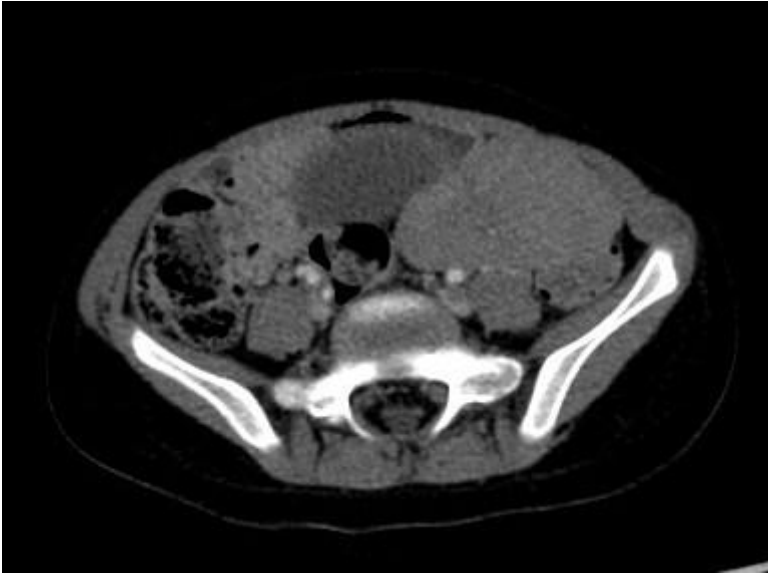
e



**Description:** Colour Doppler US shows an afferent tumour vessel in the renal lesion. **Origin:** Department of Bio-Imaging and Radiological Sciences, Catholic University, Policlinic "A. Gemelli", Rome, Italy

**Figure 2**

**a**



**Description:** Axial contrast-enhanced CT demonstrates a hypodense mass lesion in left iliac fossa.

**Origin:** Department of Bio-Imaging and Radiological Sciences, Catholic University, Policlinic "A. Gemelli", Rome, Italy

**b**



**Description:** Axial contrast-enhanced CT shows a hypodense mass lesion in pelvis, posterior to bladder. **Origin:** Department of Bio-Imaging and Radiological Sciences, Catholic University, Policlinic "A. Gemelli", Rome, Italy

**c**



**Description:** Axial contrast enhanced CT demonstrates multiple hypoattenuating areas in the renal parenchyma. **Origin:** Department of Bio-Imaging and Radiological Sciences, Catholic University, Policlinic \"A. Gemelli\", Rome, Italy

**d**



**Description:** Axial contrast enhanced CT shows a hypodense focal area in the body of pancreas. **Origin:** Department of Bio-Imaging and Radiological Sciences, Catholic University, Policlinic \"A. Gemelli\", Rome, Italy



e



**Description:** CT axial image, showing the sphenoid soft-tissue mass, with osteolysis of surrounding bone. **Origin:** Department of Bio-Imaging and Radiological Sciences, Catholic University, Policlinic "A. Gemelli", Rome, Italy