

## BURKITT'S LYMPHOMA AS POSSIBLE CAUSE OF ACUTE ABDOMEN – CASE REPORT

Predrag Djurdjević<sup>1</sup>, Drakce Radovanović<sup>2</sup>, Snežana Sretenović<sup>1</sup>, Zaklina Necin-Jovanović<sup>1</sup>,  
Danijela Živić<sup>1</sup>, Radisav Bogojević<sup>2</sup>, Svetlana Djukić<sup>1</sup>, Nebojša Andjelković<sup>1</sup>

<sup>1</sup>Hematology department, Clinical Center Kragujevac,

<sup>2</sup>Surgery Department, Clinical Center Kragujevac,

## BURKITT-OV NON HODGKIN-OV LIMFOM KAO MOGUĆI UZROK AKUTNOG ABDOMENA – PRIKAZ SLUČAJA

Predrag Djurdjević<sup>1</sup>, Drakce Radovanović<sup>2</sup>, Snežana Sretenović<sup>1</sup>, Žaklina Necin-Jovanović<sup>1</sup>,  
Danijela Živić<sup>1</sup>, Radisav Bogojević<sup>2</sup>, Svetlana Djukić<sup>1</sup>, Nebojša Andjelković<sup>1</sup>

<sup>1</sup>Centar za hematologiju, Interna Klinika, KC Kragujevac

<sup>2</sup>Hiruška Klinika, KC Kragujevac

Received / Primičen: 24. 03. 2008.



Accepted / Prihvaćen: 04. 08. 2008.

### ABSTRACT

The term acute abdomen refers to acute abdominal conditions presenting with sudden, severe pain and signs of inflammation or dysfunction of abdominal organs, which in basics can be defined by variety of diseases.

A 19-year-old Caucasian male was admitted to the Emergency Department of the Clinical centre in Kragujevac with the condition of acute abdomen. The appropriate diagnostic procedures revealed a neoplastic process localised at the omentum majus, on the small stomach curve, in the hepatic hilus, small bowel mezo, sigmoid colon, vermiform appendix and associated lymphoid nodes, with diffuse infiltration of the small bowel wall, especially in the terminal part of jejunum. These clinical features are general characteristics of abdominal Burkitt's lymphoma and correspond to a sporadic form of Burkitt's lymphoma with nodal and extranodal localisation, negative for HIV infection. This form constitutes less than 1% of adult lymphomas worldwide.

In conclusion, there are various manifestations of Burkitt's lymphoma that have overlapping symptoms and signs with other intra-abdominal diseases. Although the presented case may not be a typical example of Burkitt's lymphoma, it is undoubtedly an aggressive lymphoma that requires an intensive and broad diagnostic approach and appropriate therapy, especially for the many intrinsic entities such as acute abdomen.

**Key words:** acute abdomen, Burkitt's lymphoma

### INTRODUCTION

The term acute abdomen refers to acute abdominal conditions presenting with sudden, severe pain and signs of inflammation or dysfunction of abdominal organs<sup>1</sup>. However, it cannot be considered as a final diagnosis. It represents, in many cases, a condition requiring urgent management, even before all necessary diagnostic procedures are completed<sup>1,2</sup>. The patient described herein was admitted to the urgent medical care unit with the condition of acute abdomen, which was determined to be abdominal Burkitt's lymphoma.

Burkitt's lymphoma (BL) is a highly malignant, aggressive and rapidly growing B cell non-Hodgkin's lymphoma<sup>2</sup>,

### SAŽETAK:

Termin akutni abdomen označava sva akutna stanja praćena jakim bolovima u stomaku i znacima inflamacije i/ili disfunkcije organa trbušne duplje koja se mogu javiti tokom različitih oboljenja.

Bolesnik star 19 godina primljen je u Urgentni centar Kliničkog centra Kragujevac zbog bolova u stomaku nejasne etiologije i otežanog disanja. Nakon sprovođenja neophodnih dijagnostičkih procedura, otkriven je neoplastični proces koji je bio lokalizovan na omentumu majusu, maloj želudačnoj krivini, u hilusu jetre, malom crevnom mezou, sigmoidnom kolonu, crvuljku kao i pridruženim limfnim čvorovima sa difuznom infiltracijom zida tankog creva, pretežno jejunuma. Posle učinjene eksplorativne hiruške intervencije i učinjene biopsije postavljena je i patohistološka dijagnoza – Non Hodgkin limfom, tipa Burkitt. Klinička slika odgovara sporadičnoj formi Burkittovog limfoma sa nodalnom i ekstranodalnom lokalizacijom, HIV negativnog serotipa.

Ovaj klinički slučaj govori da se Burkittov limfom može ispoljiti simptomima i znacima karakterističnim za različite bolesti intraabdominalne lokalizacije. Iako prezentovan slučaj ne predstavlja tipičan primer Burkittovog limfoma, svakako nam ukazuje da ovako agresivan limfom zahteva intenzivan i širok dijagnostički pristup i odgovarajuću terapiju, pogotovo u takvim klinički intrigantnim entitetima kakav je akutni abdomen.

**Glavne reči:** akutni abdomen, Burkitt-ov limfom

which has a low long-term survival rate<sup>4,5</sup>. According to the WHO Classification, there are three clinical variants of Burkitt's lymphoma: endemic, sporadic and immunodeficiency-associated types<sup>6,7</sup>. The endemic variant of Burkitt's lymphoma is related to EBV or malaria infection and usually occurs in African children, 4-7 years old, involving the jawbone and other facial bones, as well as kidneys, ovaries, gastrointestinal tract, breasts and other extranodal sites<sup>6,7</sup>. Sporadic Burkitt's lymphoma is an extranodal disease associated with no specific geographic or climate area and accounts for about 40% of all lymphomas in children and only 1%-2% of those in adults<sup>5</sup>. Although almost



any organ of the body may be involved, the most common localisation is intra-abdominal, affecting the intestinal tract, ovaries, kidneys, omentum and Waldeyer's ring, but very rarely lymph nodes of any localisation<sup>5,8</sup>. Immuno-deficiency-associated Burkitt's lymphoma occurs mainly in patients infected with HIV, but also occurs in acquired and congenital immunodeficient patients<sup>9,10</sup>. The incidence of certain subtypes of Burkitt's lymphoma depends mostly on geographic area, and incidence of associated conditions. These observations emphasise the importance of precise disease definition for biological and epidemiological studies.

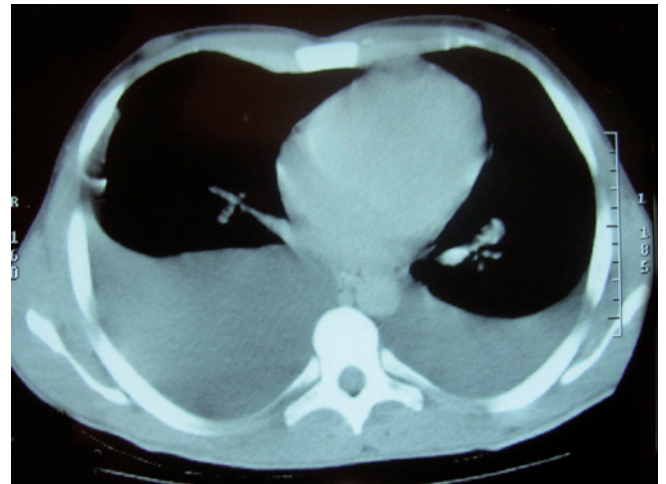
## CASE REPORT

In December 2007, a 19-year-old Caucasian white male was referred to the Emergency Department of the Clinical centre in Kragujevac with dyspnea, abdominal swelling and upper abdominal pain. The patient confirmed that the above-mentioned symptoms had started spontaneously 4 days previously, first with the developing dyspnea, followed by the feeling of abdominal swelling and subsequent pain. Physical examination revealed axillar lymphadenopathy with lymph nodes of diameter around 10 mm, silent pulmonary sound on the both sides in the middle and lower lung fields and a tense abdominal wall (preventing spleen and liver palpation) with direct signs of peritoneal effusion.

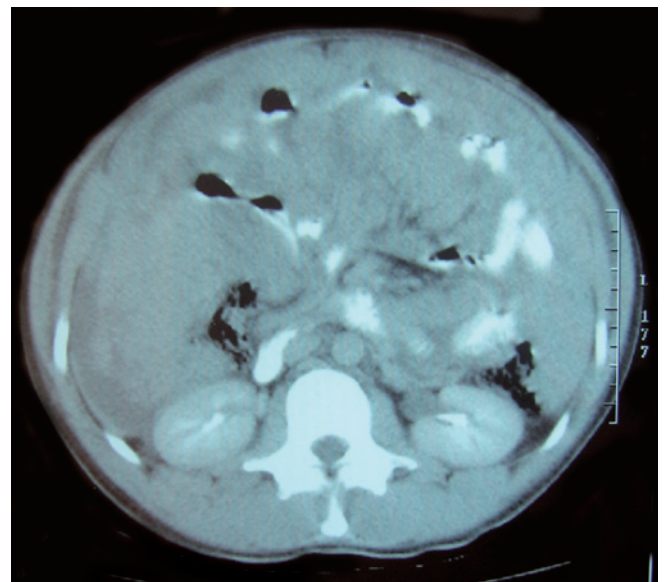
Laboratory findings for haemoglobin levels and leukocyte and platelet counts were normal. Coagulation tests were within normal reference values. The erythrocyte sedimentation rate, fibrinogen level and C-reactive protein were normal, which confirmed non-infectious aetiology. The other important biochemical blood parameters were lactate dehydrogenase (LDH), 6603 U/L; acidum uricum, 1045 umol/L; and creatine kinase, 218 U/L. Liver function was also altered, which presented in the serum levels of total proteins, 53 g/L; aspartate-aminotransferase (SGOT), 145 U/L; and alanine-aminotransferase (SGPT), 45 U/L; but without an increase in bilirubin levels. The serum IgG and IgM levels were lower than normal, while circulating immune complexes, C3, C4, rheumatoid factor, as well as IgA level, were within normal reference values. The virology report confirmed the absence of HBsAg, anti-HCV Ab and antiHIV Ab. The patient's oxygen and carbon dioxide partial pressures (pCO<sub>2</sub> and pO<sub>2</sub>) in the arterial blood showed hypoxia and hyperkapnia. The patient was put on oxygen support, which made the further diagnostic procedures less stressful.

The chest X-ray showed pleural effusion in the right lung to the level of the second rib. After performing pleural puncture of 800 ml of clear liquid, the biochemical analyses confirmed pleural exudate with an extremely high level of lactate dehydrogenase (17,920 U/L), which suggested lymphoproliferative disease. A bone marrow biopsy was performed for confirmation.

In further procedures, an abdominal ultrasound scan and thoracic and abdominal CT confirmed the presence of pleural effusion, but of reduced volume, conceivable oesophageal perforation and diffuse infiltration of convolutions of the small bowel, together with mesenterium and omentum majus, infiltrating vermiform appendix and right perirenal area with discrete findings of peritoneal infiltration (Figures 1, 2, 3). The liver was slightly enlarged, the spleen was 111 mm in cranio-caudal diameter, and both were surrounded by peritoneal free liquid effusion (Figure 4).



**Figure 1.** The presence of bilateral pleural effusion confirmed by the thoracic CT.

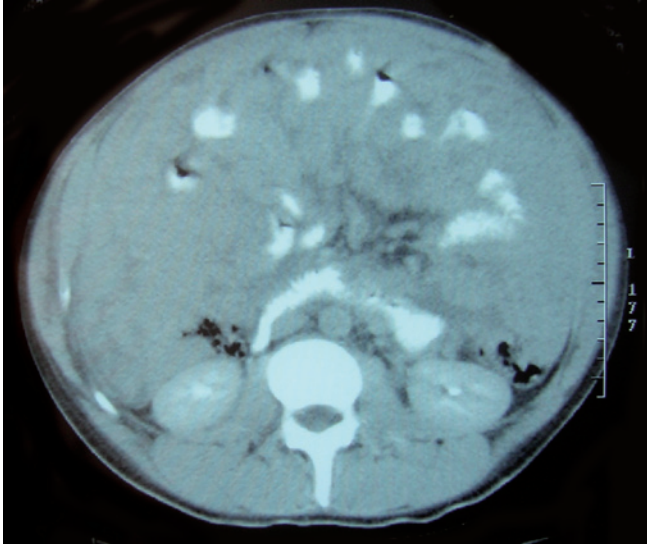


**Figure 2.** Diffuse infiltration of small bowel convolutions together with mesentery and greater omentum, infiltrating vermiform appendix and right perirenal area with discrete findings of peritoneal carcinosis.

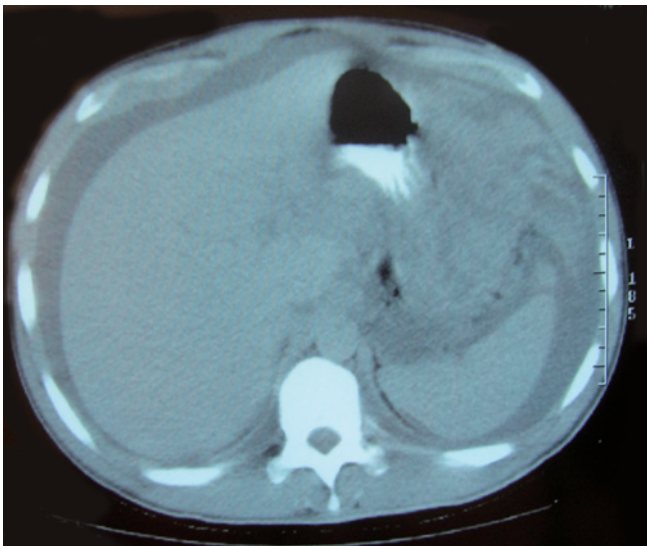
The patient underwent explorative laparotomy, which confirmed the presence of neoplastic disease in the peritoneal cavity. Specifically, the disease was localised at the



omentum majus, on the small stomach curve, in the hepatic hilus, small bowel mezo, sigmoid colon, vermiform appendix and associated lymphoid nodes, with diffuse infiltration of the small bowel wall, especially on the terminal part of jejunum. *Ex tempore* biopsy confirmed malignant tissue and no other procedures were performed, except for the extirpation of an enlarged lymphoid gland of the small bowel's mezo for final histopathology diagnosis. Perforation of the oesophagus, or any other organ, was not confirmed.



**Figure 3.** Diffuse infiltration of small bowel convolutions together with mesentery and greater omentum, infiltrating vermiform appendix and right perirenal area with discrete findings of peritoneal carcinosis.

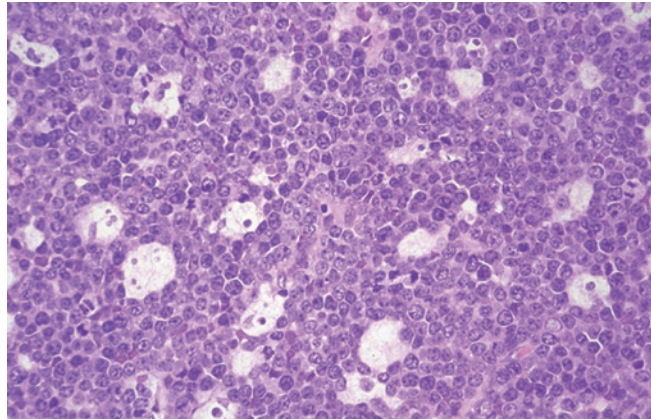


**Figure 4.** Normal size spleen and slightly enlarged liver were both surrounded with peritoneal effusion.

On the histopathology report, the enlarged lymphoid node completely lost its anatomical structure and was infiltrated with the malignant cells, which gave it a “star-

ry sky” appearance. Immunocytochemical stained cells were positive for CD79 $\alpha$ , CD20 and Ki-67 (100%), and slightly positive for CD43 and CD10, which confirmed the diagnosis of high risk non-Hodgkin’s lymphoma, B cell phenotype - Burkitt’s lymphoma type (Figure 5). Bone marrow examination confirmed only non-specific reactive changes.

On completion of all the necessary diagnostic procedures, the patient’s general condition deteriorated from day to day, resulting in renal, liver and pulmonary failure with a fatal outcome before any specific anti-neoplastic therapy could be applied.



**Figure 5.** Light microscopy of the mesenteric lymphoid gland infiltrated with Burkitt’s lymphoma cells, found in our patient (H/E, x40).

## DISCUSSION

The diagnosis of acute abdomen continues to be one of medicine’s most tempting tasks. Acute abdomen represents 5% to 10% of all emergency department visits<sup>11</sup>. The abdomen might be considered an incredibly intricate biological “black box”, in which it is extremely difficult to pinpoint the source of distress. One of the main obstacles to the diagnostic process in patients with acute abdomen is the physician’s own personal bias. A presumptive diagnosis is often reached before the data are fully collected, where such haste leads to overuse of tests and delays in establishing the correct diagnosis. Certain diseases develop an easily distinguished clinical picture in comparison to others, such as sickle cell crisis, mesenteric ischemia, intestinal obstruction and diabetes mellitus, which cause an onset of numerous clinical signs. The astute physician follows a progression of symptoms and signs of the disease over time and notes their onset, as well as their character and severity, in order to reach the correct final diagnosis.

As challenging as it is, careful history-taking, thorough evaluation of the symptoms, physical examination and a judicious use of laboratory tests can simplify the evaluation of the this acute condition. This article aims to illustrate one of the possible primary diseases loca-





lised to the abdominal cavity and not often considered as a cause of acute abdomen.

In 1958, Dennis Burkitt, a surgeon, first described a disorder presenting with jawbone tumours in African children<sup>12</sup>. He noted children with huge facial tumours uni- or bilaterally involving mostly jawbones, but also other facial bones, and sometimes accompanied by enormous abdominal masses. A few years later, the neoplasm was identified as a form of malignant lymphoma, and what initially emerged as a clinical syndrome became a pathological entity called Burkitt's lymphoma<sup>13</sup>. Histologically, Burkitt's lymphoma is composed of monomorphic, medium-sized neoplastic cells of lymphocyte origin with round nuclei, multiple nucleoli and relatively abundant basophilic cytoplasm. These cells typically possess an extremely high proliferation rate and high rate of programmed cell death (apoptosis). Morphological tumour characteristics are numerous, including admixed body macrophages phagocytosing abundant apoptotic debris, creating a typical "starry-sky" pattern<sup>8</sup>. The exact origin of the malignant cells is still unknown. Namely, the origin of these cells is currently thought to be a germinal centre B cell<sup>14</sup>, although several studies on IgHV genes in Burkitt's lymphoma suggest that they may derive from memory B cells, rather than germinal centre B cells<sup>15</sup>.

Burkitt's lymphoma is a unique tumour that sheds light on the understanding of lymphomagenesis. It is the first human neoplasm that is causally associated with viral infection (EBV). The *c-myc* gene that is expressed in Burkitt's lymphoma cells was the first oncogene to be described in lymphomas<sup>16</sup>. In addition, it is the first described non-Hodgkin's lymphoma associated with HIV infection. Among human neoplasms, Burkitt's lymphoma has the shortest doubling time.

There are three types of Burkitt's lymphoma. While the endemic or African types usually present with tumour masses localised on jawbone or retroperitoneum and strong association with Epstein-Barr viral infection, the sporadic type typically presents as an intra-abdominal tumour or digestive tract lesion<sup>17</sup>, as seen in our patient.

The sporadic type of Burkitt's lymphoma is often associated with HIV infection, especially in adults, and is rarely associated with Epstein-Barr infection<sup>18</sup>. On initial presentation, extranodal tumour localisation, predominantly in some intra-abdominal organs such as stomach, distal ileum, cecum or appendix, is most common<sup>19,20,21</sup>. Rarely, the disease is disseminated throughout almost all the intra-abdominal organs and lymph nodes, as described in this patient. Lymphoma cells were found in the omentum majus, on the small stomach curve, in the hepatic hilus, small bowel mezo, sigmoid colon and vermiform appendix, with the diffuse penetration in the small bowel wall, especially on the terminal part of jejunum. Because of this, the initial localisation of the disease could not be determined. Generally, the disease usually presents with mild and non-specific gastrointestinal symptoms and "B" symptoms, such as weight loss, unexplained fever and night sweats<sup>22</sup>. These symptoms are identical to those of numerous opportunistic infections and may delay the diagnosis of lymphoma. In the extreme, Burkitt's lymphoma can initially manifest with aggressive gastrointestinal symptoms and signs, which demonstrate an advanced disease requiring surgical treatment, as we noted in our patient<sup>23</sup>. Although the prognostic features have not yet been determined, some features that have been associated with adverse outcome in adults and children include older age, advanced disease, poor performance status, bulky disease, high level of LDH and involvement of central nervous system or bone marrow<sup>24</sup>. Almost all mentioned prognostic factors were present in our patient, culminating with a fatal outcome before any specific anti-neoplastic therapy could be applied.

Lessons learned: These findings indicate that there are different manifestations of Burkitt's lymphoma, which overlap with other intra-abdominal illnesses in symptoms and signs. Although the presented case may not be a typical example of Burkitt's lymphoma, it undoubtedly suggests an aggressive lymphoma that requires an intensive and broad diagnostic approach and appropriate therapy, especially in many intrinsic entities such as acute abdomen.

## ABBREVIATIONS

Ab – antibody  
 Ag – antigene  
 BL – Burkitt's lymphoma  
 C3, C4 – complement compartments  
 CRP – ..... reactive protein  
 CT – computerised tomography  
 EBV – Epstein – Barr virus  
 HIV – Human immunodeficiency virus  
 IgA – Immunoglobulin class A  
 IgG – Immunoglobulin class G  
 IgM – Immunoglobulin class M  
 LDH – Lactate dehydrogenase  
 pO<sub>2</sub> – Oxygen partial pressure in arterial blood  
 pCO<sub>2</sub> – Carbon dioxide partial pressure in arterial blood

## REFERENCES

1. Mlinaric I. Akutni abdomen. U: Dragovic M, Gerzic Z. Hirurgija., ed 1. Medicinska knjiga-Medicinske komunikacije, Beograd 1998, 1157-1164.
2. Lyon C, Clark D. Diagnosis of acute abdominal pain in older patients. *Am Fam Phys* 2006; 74(9): 1537-44.
3. Patte C, Ribreg V, Brugières L. Non Hodgkin lymphoma in adolescents. *Bull Cancer* 2007; 94(4): 339-48.
4. Cossaro M, Noce L, Bonutti A et al. An a abdominal Burkitt's lymphoma in acute phase. Case report. *Minerva Pediatr* 2006; 58(3): 311-18.
5. Blum KA, Lozanski G, Byrd JC. Adult Burkitt leukemia and lymphoma. *Blood* 2004; 104: 3009-3020.
6. Ferry JA. Burkitt's Lymphoma: Clinicopathologic Features and Differential Diagnosis. *The Oncologist* 2006; 11(4): 375-383.



7. Kelly GB, Rickinson AB, Burkitt Lymphoma: Revisiting the Pathogenesis of a Virus-Associated Malignancy. *Hematology*, 2007.
8. Diebold J. Burkitt lymphoma. In: Jaffe E, Harris N, Stein H et al., eds. *Pathology and Genetics of Tumours of Haematopoietic and Lymphoid Tissues*. Washington, DC: IARC Press, 2001:181–184.
9. Gong JZ, Stenzel TT, Bennett ER et al. Burkitt lymphoma arising in organ transplant recipients: a clinicopathologic study of five cases. *Am J Surg Pathol* 2003;27:818–827.
10. Xicoy B, Ribera JM, Esteve J et al. Post-transplant Burkitt's leukemia or lymphoma. Study of five cases treated with specific intensive therapy (PETHEMA ALL-3/97 trial). *Leuk Lymphoma* 2003;44:1541–1543.
11. Jess P. Prognosis of acute nonspecific abdominal pain. *Am J Surg* 1982;144: 338-43.
12. Burkitt DP. Sarcoma involving jaws in African children. *Br J Surg* 1958; 46: 218–23.
13. O'Connor GT. Malignant lymphoma in African children. II. A pathological entity. *Cancer* 1961;14:270–83.
14. Tamaru J, Hummel M, Marafioti T et al. Burkitt's lymphomas express VH genes with a number of antigen-selected somatic mutations. *Am J Pathol* 1995;147:1398–407.
15. Isobe K, Tamaru J, Nakamura S et al. VH gene analysis in sporadic Burkitt's lymphoma: somatic mutation and intraclonal diversity with special reference to the tumor cells involving germinal center. *Leuk Lymphoma* 2002;43:159–64.
16. Adams J, Harris A, Pinkert C et al. The c-myc oncogene driven by immunoglobulin enhancers induces lymphoid malignancy in transgenic mice. *Nature* 1985;318:533–538.
17. Boerma EG, van Imhoff GW, Appel IM et al. Gender and age-related differences in Burkitt lymphoma--epidemiological and clinical data from The Netherlands. *Eur J Cancer* 2004;40:2781–2787.
18. Onder AM, Reeves-Garica J. The endoscopic and computed tomographic appearance of Burkitt's lymphoma of the stomach with follow-up studies. *International Pediatrics* 2003; 18: 55-57.
19. Gurney AE, Cartwright RA, Gilman EA. Descriptive epidemiology of gastrointestinal non-Hodgkin's lymphoma in a population based registry. *Br J Cancer* 1999; 79: 1929-34.
20. Bissen L, Brasseur R, Azagra JS, Deiree P. Burkitt's lymphoma of the appendix. *JBR-BTR* 2002; 85(5): 257-59.
21. Papandreou E, Gentimi F, Baltogiannis N et al. Nonendemic Burkitt lymphoma presenting with an atypical clinical picture. *J Pediatr Hematol Oncol* 2007; 29(9): 661-3.
22. Cappell MS, Botros N. Predominantly gastrointestinal symptoms and signs in 11 consecutive AIDS patients with gastrointestinal lymphoma: a multicenter, multiyear study including 763 HIV-seropositive patients. *Am J Gastr* 1994; 89: 545-49.
23. Haralambieva E, Boerma EJ, van Imhoff GW et al. Clinical, immunophenotypic, and genetic analysis of adult lymphomas with morphologic features of Burkitt lymphoma. *Am J Surg Pathol* 2005;29:1086–1094.
24. Patte C, Auperin A, Michon J et al. The Societe Francaise d'Oncologie Pediatrique LMB89 protocol: highly effective multi-agent chemotherapy tailored to the tumor burden and initial response in 561 unselected children with B-cell lymphomas and L3 leukemia. *Blood* 2001;97:3370–79.

