Pancreatic Involvement of Burkitt Lymphoma in a Child and Review of the Literature

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Abstract

Pancreatic involvement of non-Hodgkin's lymphoma is extremely rare in childhood and can be overlooked in differential diagnosis of pancreatic masses. In this report we described a 10-year-old boy who presented with pancreatitis and obstructive jaundice, which was the result of pancreatic involvement of Burkitt lymphoma.

Keywords: Pancreatic involvement, Burkitt lymphoma, children, pancreatitis

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Introduction

Involvement of pancreas in childhood Burkitt lymphoma (BL) is unusual, and also jaundice, as a presenting manifestation of pediatric non-Hodgkin's lymphoma (NHL), has sparsely been reported in literature [1-4]. Herein, we present a 13 year-old boy with NHL with obstructive jaundice and the unusual finding of pancreatic involvement.

The Case

Thirteen-year-old boy was admitted with abdominal pain, jaundice and loss of weight. He had a palpable liver extending 4 cm below the right costal margin, and an abdominal mass in the left lumbar region. Laboratory investigations at admission demonstrated an elevated levels of serum aspartate aminotransferase 131 U/L, alanine aminotransferase 207 U/L, gamma-glutamyltransferase 580 U/L, alkaline phosphatase 1051 U/L, total bilirubin 7.23 mg/dl, and direct bilirubin 5.65 mg/dl, lactate dehydrogenase 295.7 U/L, amylase 214 U/L, lipase 222 U/L. Serum electrolytes, calcium, blood urea nitrogen, creatinine, uric acid and the coagulation profile were normal. Serological studies for human immunodeficiency virus, hepatitis B, hepatitis C, cytomegalovirus, and Epstein-Barr virus were negative. On abdominal ultrasonography (US) and color Doppler US, two hypoechoic nodules were detected in the liver, 2.5 cm and 6 cm in diameter, consecutively (Figure 1A). There were also multifocal hypoechoic pancreatic nodules approximately 2-3 cm in size and a large vascular mesenteric mass in the left side of abdomen (Figure 1B). On dynamic magnetic resonance imaging (MRI) and magnetic resonance cholangiopancreatography (MRCP) (Figure 1C-F), one of the nodules of the liver was hyperintense on T1 weighted and hypointense on T2 weighted images. The other nodule and the mesenteric mass were hypointense on T1 weighted and slightly hyperintense on T2 weighted images. The pancreatic nodules were hypointense in respect to pancreatic tissue on both T1 and T2 weighted sequences. All the nodules enhanced slightly and heterogenously after intravenous gadolinium administration. The gall bladder was hydropic and the intrahepatic-extrahepatic biliary tree was prominently dilated. The dilatation ended abruptly at the level of the lesion located in the pancreatic head. Due to the diffusiveness and signal/enhancement patterns of the lesions, lymphoma was presumed radiologically.

The patient underwent US-guided liver biopsy. Pathological investigation showed BL (Figure 2G-H). Microscopic examination of bone marrow biopsy showed involvement of lymphoma. The patient was staged according to Murphy system as having stage IV disease. He was treated according to the high risk arm of NHL BFM (Berlin-Frankfurt-Munster)-95 chemotherapy protocol. He had an excellent response to treatment. At the end of the 3rd course of chemotherapy, control computed tomography (CT) was performed. On CT, the liver lesions were seen to regress in size. The pancreas was normal. There were mesenteric lymph nodes, the largest of which was approximately 1 cm in size. A biopsy was performed from hepatic nodules and revealed necrosis with no viable cells. At the end of the chemotherapy, complete remission was achieved. However, he relapsed in the left kidney 1 month after completion of the chemotherapy. ICE (Ifosfamide-Carboplatin-Etoposide)-rituximab chemotherapy protocol was given. After two cycles of the therapy, there was an unresponsiveness to the treatment. The patient died from disease progression 7 months after the diagnosis.

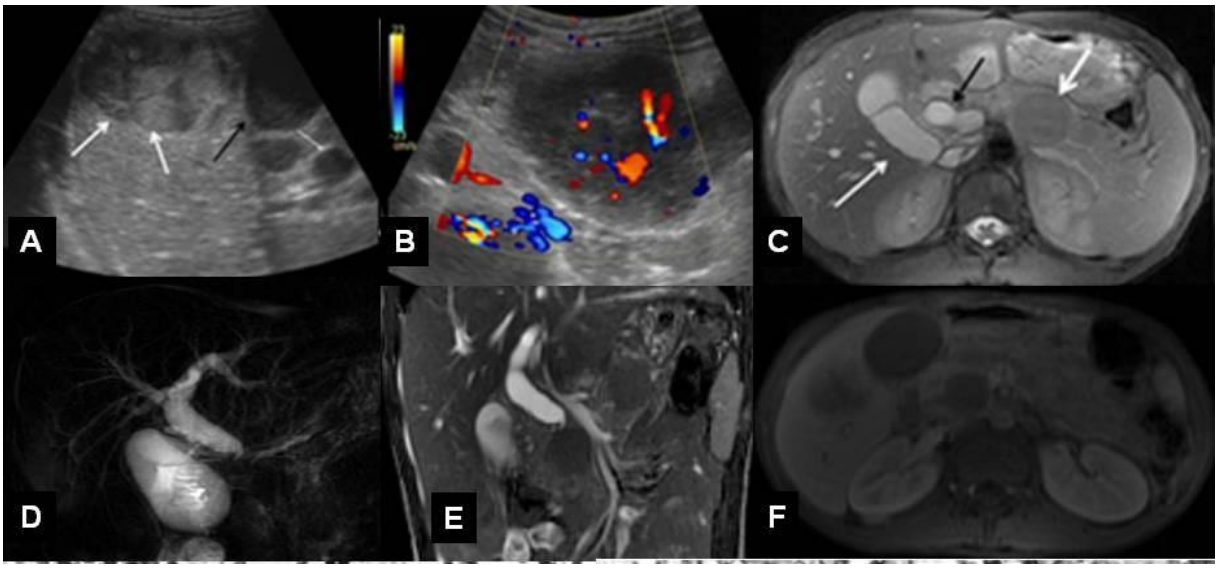

Figure 1 Radiologic Findings: A: On US, a heterogenous hypoechoic nodular lesion is seen in liver (white thick arrow). The gall bladder is dilated (black thick arrow). Note the hypoechoic pancreatic lesion (white thin arrow), **B:** On color Doppler US, increased vascularity is detected inside the mesenteric mass. **C:** On T2 weighted MRI, a hypointense mass is seen in the pancreatic corpus (white thick arrow). Note the choledochal dilatation (black arrow) and the gall bladder enlargement (white thin arrow). **D:** On thick slab MRCP view, the biliary tree is prominently dilated. **E-F:** On T2 weighted coronal image **(E)** and contrast-enhanced T1 weighted transverse image **(F)**, the dilated choledoch ended abruptly (white thin arrow) at the level of the pancreatic head. Note the pancreatic head mass which is hypointense on both T2 weighted (white thick arrow) and T1 weighted (white dashed arrow) images.

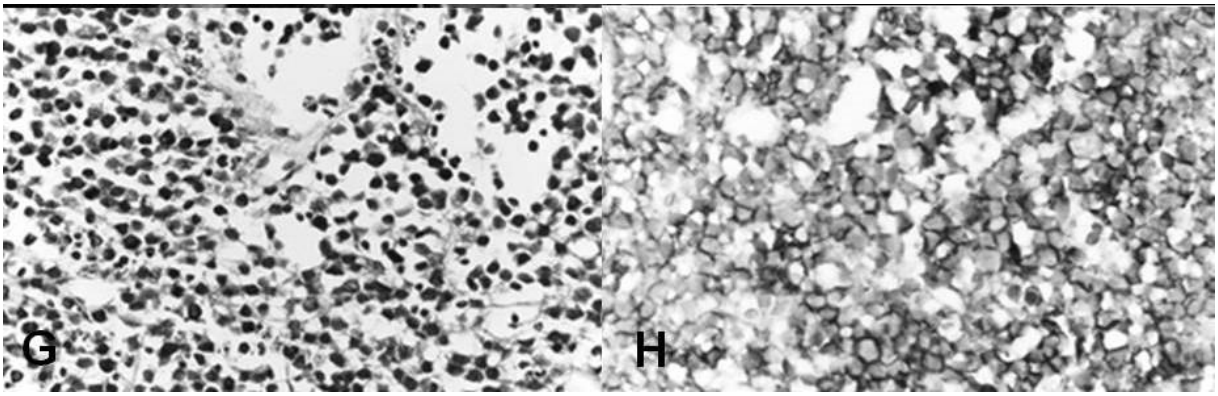

Figure 2 Pathological Findings: G: Diffuse infiltration of monotonous, small to medium-sized atypical lymphocytes (HE, x400), **H:** Positive staining of atypical lymphocytes with CD20 (x400)

Table 1. Clinical Characteristics and Treatment Results of Children with Pancreatic Involvement of Childhood Non-Hodgkin's Lymphoma

Case	Age (years)	Sex	Clinical features	Imaging Findings	Diagnosis	Disease free survival
Pietsch et al	6	M	Jaundice, epigastric pain	2 cm mass in head of pancreas, biliary duct dilatation	Burkitt lymphoma	5 months
Pietsch et al	5	F	Jaundice, diarrhea, vomiting	5 cm mass in head of pancreas, biliary duct dilatation	Large transformed B cell lymphoma	11 years
Meier et al	8	M	Jaundice, epigastric pain, diabetes mellitus	Diffusely enlarged pancreas, mass in head of pancreas	Burkitt lymphoma	3.25 years
Kurosawa et al	14	M	Jaundice, abdominal pain, spinal cord compression	Diffusely enlarged pancreas, biliary duct dilatation	Burkitt lymphoma	2.5 years
Francisko et al	13	M	Abdominal pain	5 cm mass in tail of pancreas	Peripheral B cell lymphoma	2 years
Turkish et al	10	M	Jaundice, abdominal and back pain, pruritic rash	Diffuse enlargement in head of pancreas and focal mass, cavernous transformation of portal vein	Anaplastic large T cell lymphoma	2 years
Fernandez-Plaza et al	14	F	Jaundice, abdominal pain, dyspnea, pericardial effusion	5 cm mass in head of pancreas, biliary duct dilatation	Diffuse large B cell lymphoma	4.5 years
Eisenhuber et al	14	M	Jaundice, abdominal pain	Diffuse enlargement of pancreas and 2-3 cm homogeneous masses, biliary duct dilatation	Diffuse large B cell lymphoma	1.5 years
Aftandilian et al	10	M	Snoring, nasal congestiob, hoarseness, respiratory distress at night	Parapharyngeal mass, 2 masses in body and head of pancreas	Burkitt Lymphoma	6 years
Amido J et al	6	M	Jaundice, vomiting	Diffuse enlargement of pancreas, biliary duct dilatation, large pelvic mass	Burkitt Lymphoma	Not available
This case	13	M	Jaundice, abdominal pain	Multiple nodules in pancreas, biliary duct dilatation	Burkitt Lymphoma	Died

Discussion

The clinical presentation of Burkitt lymphoma is varied and depends on the site of involvement. Clinical manifestations in the abdomen are commonly secondary to compression, obstruction of adjacent structures, or infiltration of structures by tumor. Common presenting symptoms include abdominal pain, palpable mass, nausea and vomiting, intestinal obstruction due to bowel compression or intussusception, and acute appendicitis. Weight loss, fever, and other systemic features present more often with disseminated disease but are less commonly seen than in other types of nonHodgkin's lymphoma in childhood. Burkitt lymphoma involving the kidneys can result in renal failure secondary to obstruction or tumor infiltration of the kidneys or in paraneoplastic effects that manifest as glomerulonephritis, paraproteinemia, or cryoglobulinemia [5].

Jaundice, as a presenting manifestation of pediatric NHL, has sparsely been reported in literature. In a retrospective review of 1270 childhood cases, only 5 (0.39%) had presented with icterus [6]. The most common cause of jaundice is obstruction of the biliary tree by tumor-related compression. Jaundice was due to pancreatic nodule in our patient.

Pancreatic involvement in BL is rare and may be a manifestation of widely disseminated preterminal disease [2]. The head of the pancreas is a frequent site of involvement and there may be dilatation of the biliary tract. The series suggest that the prevalence of pancreatic involvement in pediatric NHL is in the range of 3% to 10%. A definitive diagnosis requires a biopsy; however, imaging plays an important role in the diagnosis and staging of pancreatic masses. On US, focal or diffuse hypoechoic areas of enlargement may be seen [2]. MRI findings in pediatric patients with BL have not been well described in the literature. In adults, pancreatic involvement with BL lymphoma has been described as infiltrative or focal [2]. Focal lesions may appear as a low-signal-intensity homogeneous mass on T1 and a more heterogeneous mass on T2 with low-intermediate signal amplitude. There is subtle enhancement after administration of gadolinium on T1 [2]. The findings of pancreatic involvement with BL in adults are consistent with the MRI findings in our case, in which the pancreas appeared nodular involvement and of low signal intensity on T1- and T2-weighted imaging. Similar imaging characteristics were seen in liver and mesenteric level. The

multifocality of the abdominal masses in our patient was suggestive of a systemic disease such as lymphoma.

US is the accepted standard imaging modality for the evaluation of the gall bladder and the biliary tree and can be used in mild, uncomplicated cases of acute pancreatitis. US cannot clearly delineate the extent of pancreatic disease because of the high frequency of overlying bowel gas. In adults, characterization of pancreatic disease processes is generally assessed by CT. In light of the recent attention to radiation dosages to children from CT, it is our opinion that MR is a choice for evaluation of pancreatic disease in children. We prefer the MR and MRCP for the evaluation of pancreatic ductal structure, lymph node invasion.

Pancreatic involvement rarely detected in childhood NHL [1-4,7-11]. Table I shows the pediatric patients reported in the literature to have pancreatic involvement of NHL. Only those patients, whose clinical features were available, are included here. Presented symptoms were abdominal pain and jaundice in almost all patients. The predominant involved site of the pancreas was head. Common histological types were BL and diffuse large B cell lymphoma.

Pancreatic involvement of BL may be considered one of the causes of pancreatitis in children and can be overlooked in differential diagnosis of pancreatic masses.

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References

1. Pietsch JB, Shankar S, Ford C, Johnson JE. Obstructive jaundice secondary to lymphoma in childhood. J Pediatr Surg. 2001;36(12):1792-5.
2. Amoido J, Brodsky JE. Pediatric Burkitt lymphoma presenting as acute pancreatitis: MRI characteristics. Pediatr Radiol. 2010;40(5):770-2.
3. Francisko B, Moreno L, Andrés Mdel M, Fernández-Navarro JM, Fernández-Sanmartín M, Verdeguer A. Abdominal pain as the first manifestation of primary pediatric lymphoma. J Pediatr Hematol Oncol. 2009;31(3):222-3.
4. Turkish A, Levy J, Kato M, Granowetter L, Ruzal-Shapiro C, Berdon W, Susman J, Lefkowitch J. Pancreatitis and probable paraneoplastic cholestasis as presenting manifestations of pancreatic lymphoma in a child. J Pediatr Gastroenterol Nutr. 2004;39(5):552-6.
5. Biko DM, Anupindi SA, Hernandez A, Kersun L, Bellah R. Childhood Burkitt Lymphoma: Abdominal and Pelvic Imaging Findngs. AJR Am J Roentgenol. 2009;192(5):1304-15.

6. Kutluk T, Varan A, Caglar K, Güler E, Büyükpamukçu M. Management of obstructive jaundice caused by non-Hodgkin lymphoma in children. Med Pediatr Oncol. 2001;36(6):669-70.
7. Meier C, Kapellen T, Tröbs RB, Hirsch W, Parwaresch R, Kiess W, Körholz D. Temporary diabetes mellitus secondary to a primary pancreatic Burkitt lymphoma. Pediatr Blood Cancer. 2006;47(1):94-6.
8. Kurosawa H, Matsunaga T, Shimaoka H, Sato Y, Kuwashima S, Sugita K, Hagane K, Eguchi M. Burkitt lymphoma associated with large gastric folds, pancreatic involvement, and biliary tract obstruction. J Pediatr Hematol Oncol. 2002;24(4):310-2.
9. Fernandez-Plaza S, Sevilla J, Diaz MA, Madero L, Tamariz-Martel A. Dyspnea as the first manifestation of primary pancreatic lymphoma. Pediatr Blood Cancer. 2008;50(2):434.
10. Eisenhuber E, Schoefl R, Wiesbauer P, Bankier AA. Primary pancreatic lymphoma presenting as acute pancreatitis in a child. Med Pediatr Oncol. 2001;37(1):53-4.
11. Aftandilian CC, Friedmann AM. Burkitt lymphoma with pancreatic involvement. J Pediatr Hematol Oncol. 2010;32(8):e338-40.