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CORRESPONDENCE

Complete Remission of Burkitt Lymphoma After Surgical Excision: A Case Report

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Abstract Burkitt lymphoma (BL) is a highly aggressive B cell non-Hodgkin lymphoma that has a high proliferation rate. The prognosis for BL is generally favorable, with cure rate of 75–90 % with modern chemoimmunotherapy regimens. Prompt administration of multiagent immunochemotherapy regimens is critical, because BL is almost always fatal if left untreated. Nevertheless here we report a case of BL that is still in complete remission after more than 4 years without any further treatment after surgical excision of the involved lymph node.

Dear Editor,

Here we report a case of BL that is still in complete remission without any further treatment, after surgical excision of the involved lymph node.

A 16 year-old, male was admitted to our hematology clinic on receipt of his excisional biopsy pathology report in February 2011. He reported that, he had noticed a swelling on the left side of his neck in December 2009. It was diagnosed as a simple upper respiratory tract infection, therefore antibiotics were prescribed. However, the swelling in his neck recurred at the same place in July 2010. This time, it was diagnosed as a viral infection and follow-up without treatment recommended. The patient reported that the swelling in his neck regressed but did not completely disappear in the follow-up. In February 2011, the size of the lymph node in patient's neck enlarged and as a result an excisional lymph node biopsy was performed.

On biopsy specimen, macroscopic appearance of the excised lymph node was 6 × 5 × 2 cm in diameter, yellowish in color and had a soft structure. Morphologically, the lymph node showed effacement of the normal architecture by infiltration of intermediate sized atypical lymphoid cells with marked mitotic activity and apoptosis giving a starry-sky appearance. Immunohistochemistery showed that the infiltrate was positive for CD20, CD10, BCL-6 and immunoglobulin lambda light chain and negative for BCL-2. The neoplastic cells were showing a high proliferation fraction (over 90 %) with Ki-67/MIB-1 staining. The neoplastic cells appeared negative for the other markers studied (CD5, CD21, CD43, TdT, CD3, kappa). In situ hybridization was performed on paraffin-embedded sections of the lymph node specimen using probes that recognize Epstein-Barr virus encoded RNA (EBER). The neoplastic cells appeared to be positive for Epstein-Barr virus. Interphase fluorescence in situ hybridization (FISH) revealed *MYC* gene rearrangement but *BCL2* gene was unaffected. Immunoglobulin heavy chain PCR analysis identified a clonal pattern. These findings supported the diagnosis of malignant lymphoma with B-cell phenotype. The final diagnosis was consistent with Burkitt Lymphoma. (Fig. 1).

At the time of admission the patient was in good condition and had no signs or symptoms of peripheral

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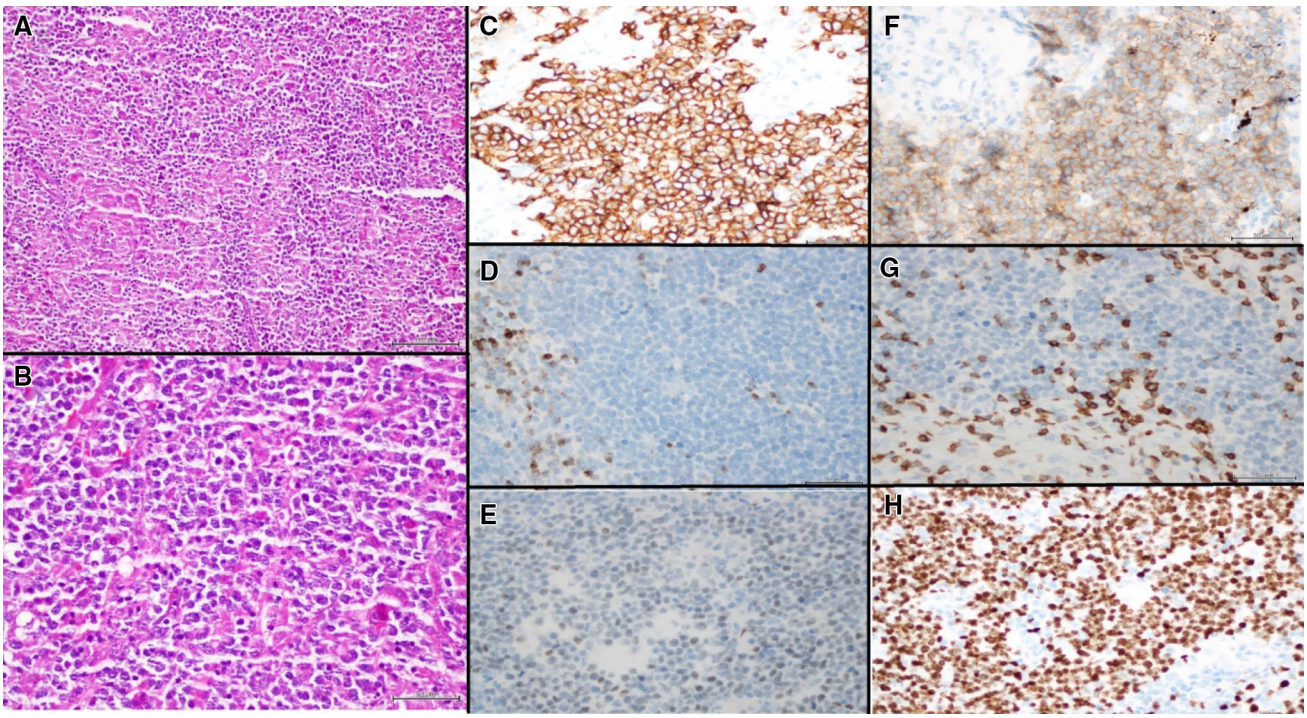

Fig. 1 **a** Epithelioid histiocytes are clustered in neoplastic cells, HEx20. **b** Neoplastic cells are monotonous, medium size, round nuclei, and few small nucleoli, HEx40. **c** CD20. **d** BCL-2**. e** BCL-6. **f** CD10. **g** CD3. **h** Ki-67/MIB-1

lymphadenopathy, splenomegaly and hepatomegaly. The patient's LDH and β2-microglobulin levels were both normal (LDH: 176 U/L, β2-microglobulin: 1.5 mg/L). Tests for hepatitis B, C and human immunodeficiency virus (HIV) were negative. The findings in the bone marrow trephine biopsy were within normal limits and did not show any infiltration of Burkitt Lymphoma. A PET/CT scan performed which showed no evidence of disease. The patient was diagnosed with Burkitt Lymphoma based on these pathological and genetic findings. After the diagnosis had been confirmed by three independent pathologists, treatment with intensive multiagent chemotherapy have been recommended to the patient. However the patient and his family were hesitant about treatment with chemotherapy because of the negative PET/CT scan after removal of the pathological lymph node and the lack of lymphoma involvement in the bone marrow. For this reason he consulted with two different clinical hematologists for a second opinion. As the result of these consultations, all risks had been explained. The patient still refused multiagent chemotherapy with close follow-up. With the recommendation of immediate contact in notification of any sign of disease, we scheduled visits every 2 months during the first year, every 3 months during the second year, and every 6 months after the second year. At these visits we performed a history and physical examination, complete blood count, chemistries, LDH and β2-microglobulin. CT scan of the neck, chest and abdomen was performed every 6 months for the first 2 years. A PET/CT scan was also performed after the first year of diagnosis. In the follow-up we saw no signs of disease progression. The patient is still in complete remission as of October 2015 without having received any kind of treatment.

Today BL is curable in a significant subset of patients when treated with dose intensive mutiagent chemotherapy regimens that also incorporates CNS prophylaxis. It is important to note that CHOP or similar regimens are not considered adequate therapy for the management of BL. Thus for patients with BL who can tolerate aggressive therapies, intensive multiagent chemotherapy may offer the best chance for durable disease control. However BL is always fatal if left untreated [1, 2].

When the general characteristics and aggressive nature of BL considered, there are two explanations for the outcome that we obtained in our patient: 1-BL of the patient has spontaneously regressed, 2-BL of the patient has failed to recur after surgical resection.

Regarding the first explanation, spontaneous regression of BL is rare and reported as case presentations in the literature. There is only six publications can be found in the literature [3–8]. Our case however is different than those reports because of the sporadic type of the disease. The second scenario is the failure of BL recurrence after total

excision of the involved lymph node. The optimal therapy of stage I BL has not been clearly defined because of the paucity of randomized studies in this uncommon disease. Therefore the treatment recommendations of stage I disease are based on experience gained from other agressive lymphoma subtypes. For this reason surgical resection is not considered sufficient for stage I BL, and treatment with fewer cycles of intensive chemotherapy (generally three cycles) recommended. However these chemotherapy regimens are highly toxic, primarily to the hematopoietic system and most patients will have a prolonged hospital stay. In our patient we absolutely recommended chemotherapy but the patient and his family refused treatment with close follow-up. Although our case represents an exception and generalizations should not be made, the outcome of our patient was good. Considering that the majority of relapses occur during the first year after completion of treatment in BL we do not expect a relapse after almost 5 years remaining in complete remission. The results of the studies published by Costa et al. [9] and Intermesoli et al. [10] are in parallel with this opinion showing a high survival and a low relapse rate after 4 years in our patient's age group. However, there are no published cases of BL successfully treated with surgery alone.

Based on these explanations, we think that our patient developed BL in an occasion of repetitive infections and we incidentally treated with surgical excision in a very early stage of the disease. In conclusion here we report an extraordinary case of BL that is still in complete remission without any further treatment after surgical excision. Even it can not be recommended or generalized, to our knowledge it is the first reported case treated with surgery alone. More studies are needed for the optimal management of early stage BL.

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Compliance with Ethical Standards

There is no funding to be reported about this work.

Conflict of interest All of the authors declare that he/she has no conflict of interest.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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