

## **Intraoperative scrape cytology: A rare case of primary ovarian Burkitt's lymphoma**

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**Abstract:** Here we have presented a case of ovarian Burkitt lymphoma. A 7 year old girl presented with ascites and fever for last two weeks. On Abdominal computer tomography (CT) a solid right ovarian mass was detected measuring 6 cm in greatest dimension. Omental deposits were also found. This patient underwent oophorectomy. We prepared the scrape smears from the ovarian mass and stained by Leishman-Giemsa, Hematoxylin and Eosin (H&E) and papanicolaou (Pap) stain. Smears showed high cellularity, mostly composed of monomorphic, small, non-cleaved cells. Few of them showed cytoplasmic vacuolation. Occasional macrophages were also noted. A provisional diagnosis of Non-Hodgkin's lymphoma probably Burkitt's lymphoma was suggested based on the cytomorphological features. Later histopathological correlation was performed which confirmed the cytological diagnosis of Burkitt's lymphoma. We concluded that intraoperative scrape cytology can be a cheap yet rapid alternative of costly frozen section method for the diagnosis of ovarian lymphoma.

**Keywords:** Burkitt lymphoma, ovarian neoplasms, scrape cytology. Intraoperative scrape cytology: A rare case of primary ovarian Burkitt's lymphoma.

### **INTRODUCTION**

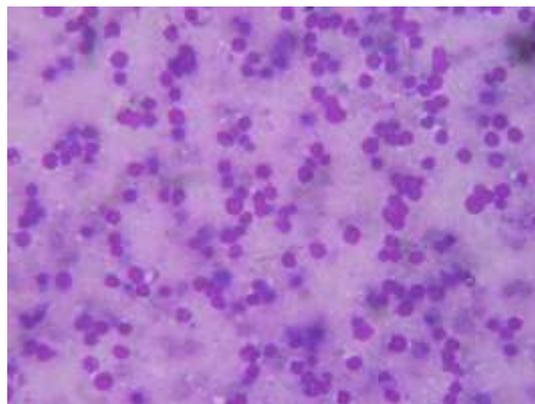
Primary ovarian lymphoma is a rare disorder, accounting for 0.5% of all non-Hodgkin's lymphomas and 1.5% of all ovarian neoplasms [1]. The majority of lymphomas involving the ovary are of B-cell phenotype; among these, Burkitt's lymphoma and diffuse large B-cell lymphoma (DLBCL) are the most common types [2]. The updated WHO Classification of Lymphoid Neoplasms (2008) identifies Burkitt's lymphoma (BL) as a highly aggressive and fast growing mature B-cell neoplasm that often presents in extranodal sites or as an acute leukemia. Although the incidence of BL is low, accounting for only 1~2% of all lymphomas in western countries, it is one of the most common types of malignant tumors in children (endemic, sporadic) and immunocompromised hosts [3]. Burkitt's lymphoma (BL) is common in areas of high malaria endemicity [4], in children and young adults [5] and is strongly associated with the Epstein-Barr virus infection. Involvement of the ovary by BL can be a manifestation of a systemic disease or, even more rarely, true primary ovarian lymphoma [6].

Here we have presented a rare case of primary ovarian Burkitt's lymphoma in a 7 year old girl. This case was diagnosed by intraoperative scrape cytology and after the surgery, histopathological confirmation was established.

### **CASE REPORT**

A 7 year old young girl was presented with vague symptoms like fever, night sweats, abdominal distension and respiratory distress for last 2 weeks. On clinical examination ascites was detected but there was no lymphadenopathy or hepatosplenomegaly. Abdominal computer tomography (CT) revealed a solid right ovarian mass measuring 6cm in greatest dimension with omental cake appearance but there was no enlarged lymph node. Cytologic evaluation of ascitic was negative for malignancy. Bone marrow aspiration report was also within normal limit. This patient underwent right sided oophorectomy. Grossly, the ovarian mass measured 6x5x4 cm. Cut section showed solid, fleshy and homogenous appearance. External surface was smooth [Figure 1]. We prepared the scrape smears from the ovarian mass and stained them by Leishman-Giemsa, Hematoxylin and Eosin (H&E) and

papanicolaou (Pap) stain. Smears showed high cellularity and consisted of diffusely scattered small round cells of uniform size and shape. The cells have scanty basophilic cytoplasm with occasional cytoplasmic vacuolation [Figure 2]. The nuclei were non-cleaved with evenly distributed chromatin pattern and prominent nuclear membranes often showing multiple nucleoli. The neoplastic cells were interspersed with scattered pyknotic cells, nuclear debris and macrophages. Occasional mitotic figures were also seen [Figure 3 a&b]. A provisional diagnosis of Non-Hodgkin's lymphoma probably Burkitt's lymphoma was suggested based on the cytomorphological features and histopathological confirmation was suggested.

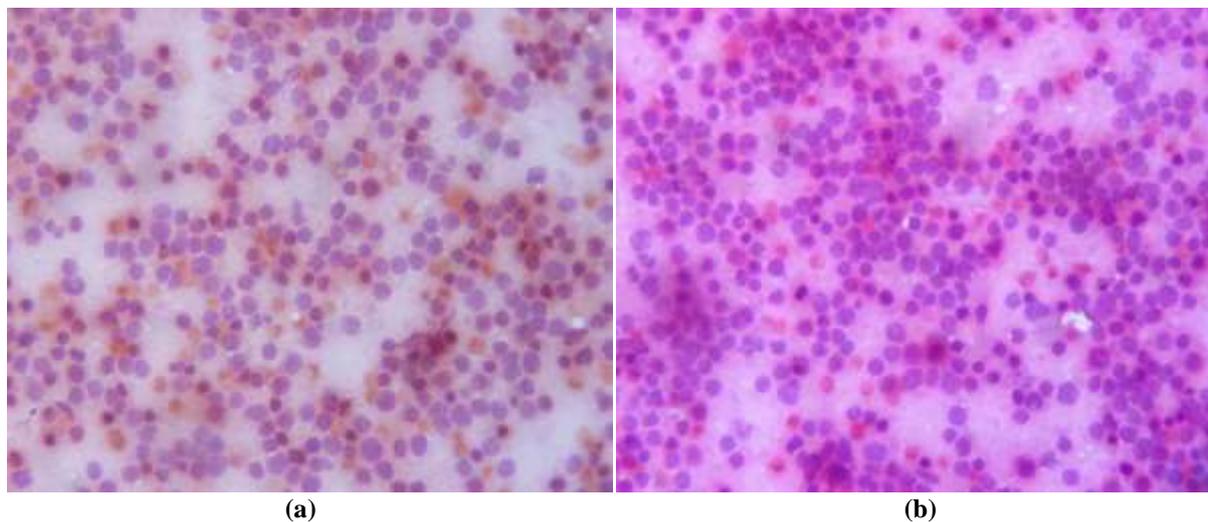


**Figure 2: Showing monomorphic, medium size, non-cleaved cells having scanty cytoplasm with occasional vacuolation [Leishman-Giemsa stain, x400]**

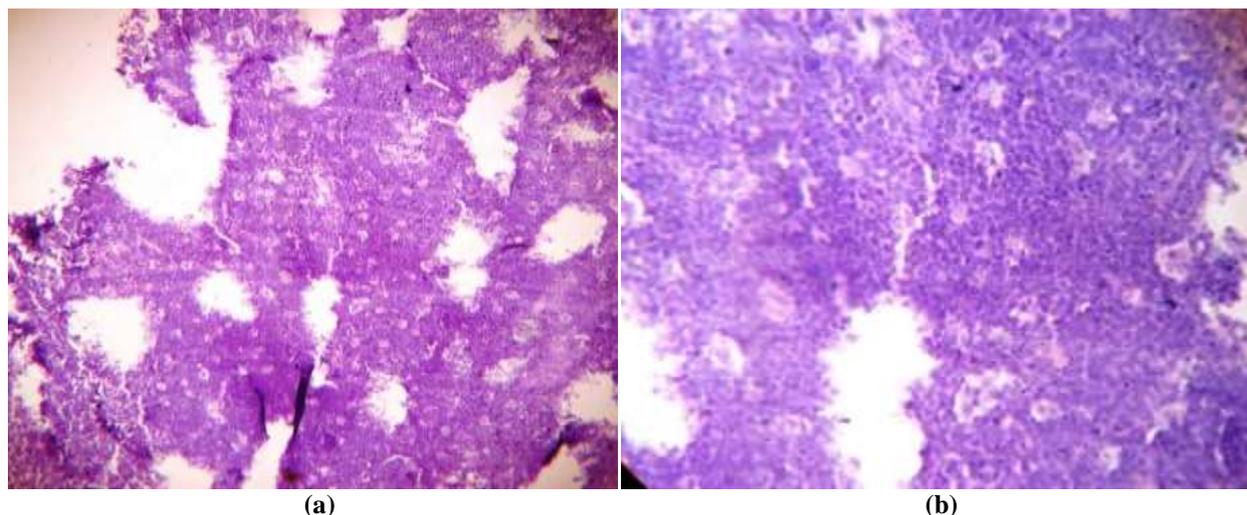


**Figure 1: Gross : Right ovarian mass measuring 6x5x4 cm and cut section shows solid, fleshy and homogenous appearance.**

Subsequent formalin fixed and paraffin embedded (FFPE) sections were stained by Hematoxylin and Eosin (H&E) stain. Sections from the right ovarian mass showed histology of a tumour composed of diffuse sheets of small cells having round to oval nuclei with several prominent basophilic nucleoli. The cells have coarse chromatin and thick nuclear membrane. The cytoplasm of the cells were amphophilic and containing small vacuoles. Numerous mitotic figures and focal prominent “starry sky” pattern were also found [Figure 4 a&b]. Based on the above histopathological findings and absence of disease in blood, bone marrow and lymph node, the final diagnosis of primary Burkitt's lymphoma of ovary was established. Sections from omentum showed tumour deposit. This patient died of septicemia within a month.



**Figure 3: Nuclei showing evenly distributed chromatin pattern and prominent nuclear membranes, also showing neoplastic cells interspersed with scattered pyknotic cells, macrophages & occasional mitotic figures [(a) Papanicolaou stain, x400 (b) H&Estain, x400]**



**Figure 4: Showing diffuse sheets of small cells with prominent “starry sky” pattern [H&Estain: (a)x100; (b) x400]**

## DISCUSSION

Intraoperative cytology has been used for many years in a variety of diagnostic situations and in most studies, has been shown to have comparable accuracy to that of the traditional frozen section. Although relatively few studies have specifically examined cytological assessment of ovarian masses, these have shown promising results.[7,8,9,10] Indeed, in some centers, cytological preparations have been used as the initial diagnostic modality with frozen section restricted to problem cases.[10] Intra-operative diagnosis of ovarian lesions can be achieved by a number of cytological techniques, including imprint, scrape cytology and intra-operative fine needle aspiration cytology. Scrape cytology is a modification of imprint cytology and its diagnostic accuracy is better than imprint cytology. [11] Scraping of the cut surface prior to smearing facilitates the harvesting of cells. Hence, scrape cytology could be preferred over touch preparations/imprint cytology as the former technique would yield much more material than the latter.[12]

Here we have presented a case of primary right ovarian Burkitt's lymphoma in a 7 year girl. We prepared the intra-operative scrape smears from the ovarian mass and stained them by Leishman-Giemsa, Hematoxylin and Eosin (H&E) and papanicolaou (Pap) stain. Smears showed high cellularity and consisted of diffusely scattered small round non-cleaved cells of uniform size and shape. The cells have scanty basophilic cytoplasm with occasional cytoplasmic vacuolation [Figure 2]. The nuclei showed evenly distributed chromatin pattern and prominent nuclear membranes with multiple nucleoli. The neoplastic cells were interspersed with scattered pyknotic cells, nuclear debris and macrophages. Occasional mitotic figures were also seen [Figure 3 a&b]. We applied the 2001 WHO leukemia/lymphoma classification system criteria for the diagnosis of Burkitt lymphoma. We required a monomorphic population of medium sized cells, with rounded nuclear contours, and deep blue cytoplasm

containing small clear vacuoles with crisp borders. [13] As these cytomorphological features were present in this case, a provisional diagnosis of Non-Hodgkin's lymphoma probably Burkitt's lymphoma was proposed and histopathological confirmation was suggested.

Subsequent formalin fixed and paraffin embedded (FFPE) sections were stained by Hematoxylin and Eosin (H&E) stain. Sections from the right ovarian mass showed histology of a tumour composed of diffuse sheets of small cells having round to oval nuclei with several prominent basophilic nucleoli. The cells have coarse chromatin and thick nuclear membrane. The cytoplasm of the cells were amphophilic and containing small vacuoles. Numerous mitotic figures and focal prominent “starry sky” pattern were also found [Figure 4 a&b]. Based on the above histopathological findings and absence of disease in blood, bone marrow and lymph node, the final diagnosis of primary Burkitt's lymphoma of ovary was confirmed following the criteria mentioned by Deepti A et al.[14]

Thus the histopathological confirmation of the cytological diagnosis was established.

## CONCLUSION

To conclude, scrape cytology is a simple, quick, accurate, inexpensive adjunctive cytodagnostic technique and its routine utilization in ovarian lesions could aid in expanding the knowledge of cytology of ovarian neoplasms. Ability of the scrape cytology smears to render immediate diagnosis highlights its role and potential usage in intra-operative consultation in institutions unequipped with frozen section facility.

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