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Case Report

Cell Block: An Unsung Hero

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Abstract

Although present since historic times, cell blocks have still been on a back seat when it comes to diagnostics, despite having immense potential. Cell block preparations made from sedimented cells can be a useful adjunct to routine cytological methods. We, thus, present a case of a 76-year-old female who would have not been treated on time, if a cell block hadn't been attempted.

Keywords: Cell Block, Immunohistochemistry, Immunocytochemistry.

INTRODUCTION

Deciphering a pathology has always been the mainstay of any diagnostic procedure, either using any cytopathological or histopathological parameters, which are now backed by newer molecular techniques, immunohistochemistry (IHC) and immunocytochemistry (ICC) [1]. Though fine needle aspiration biopsy (FNAB) is a simple, inexpensive, and fast diagnostic procedure with high accuracy, it still bears certain limitations in factors of yield, morphology, and other ancillary tests. Especially, in diagnosing a case of lymphoma, FNAB has always borne a brunt. To bridge this gap, the development of cell block techniques for the examination of cytological material has proved to be of great eminence [2]. With this advent at hand, ancillary tests like IHC, ICC can now be attempted successfully on cell blocks, in a way that mimics the histopathological sections [3].

More than a decade ago, the revised European-American classification of lymphoid neoplasms was commonly used to diagnose lymphoproliferative disorders. This classification emphasized the use of histologic architecture with morphological features and IHC studies. However, the World Health Organization (WHO) update has included immunophenotypic, cytogenetic, and molecular profiles alongside morphological features in making this diagnosis [4]. Keeping this in mind, performing IHC on tissue obtained from either biopsy or cell block technique has become a compulsion to land a definitive diagnosis.

In a stride to advance medicine, cell blocks are now been attempted to make a diagnostic call in difficult terrains like ours, where a diagnosis of lymphoma was made using this technique in a 76 year-old-female, as biopsy was not feasible due to vascular proximity.

CASE REPORT

A 76-year-old female presented to the medicine outpatient department (OPD) with chief complaints of pain abdomen and abdominal distention for 6 months, associated with loss of appetite and significant unintentional weight loss. She had a negative history of tuberculosis contact exposure. Radiology revealed multiple lymphadenopathies in the periportal region (largest 2.5 – 3.0 cm) and splenomegaly (with a splenic span of 21 cm).

Her initial investigations revealed anemia (Hemoglobin 9 g/dl) with a deranged coagulation profile. Her peripheral blood film was microcytic hypochromic. Bone marrow aspiration and biopsy done were suggestive of a hypercellular marrow with no abnormal cells. Due to multiple lymphadenopathies and the patient's clinical symptoms, a Positron Emission Tomography (PET) scan was advised which did show 18-Fluoro-deoxyglucose (FDG) uptake in mesenteric lymph nodes.

A biopsy was planned but was soon deferred due to vascular proximity of the nodes. Hereby, an ultrasound (USG) guided FNAB was attempted, under

all precautions. Cytology smears and a cell block was made from the material derived. Two air-dried smears were stained by May Grünwald Giemsa (MGG) and two alcohol-fixed smears were stained by Papanicolaou (PAP) stain and hematoxylin and eosin (H&E) respectively (Fig. 1). However, the morphology of the cells was not that clear.

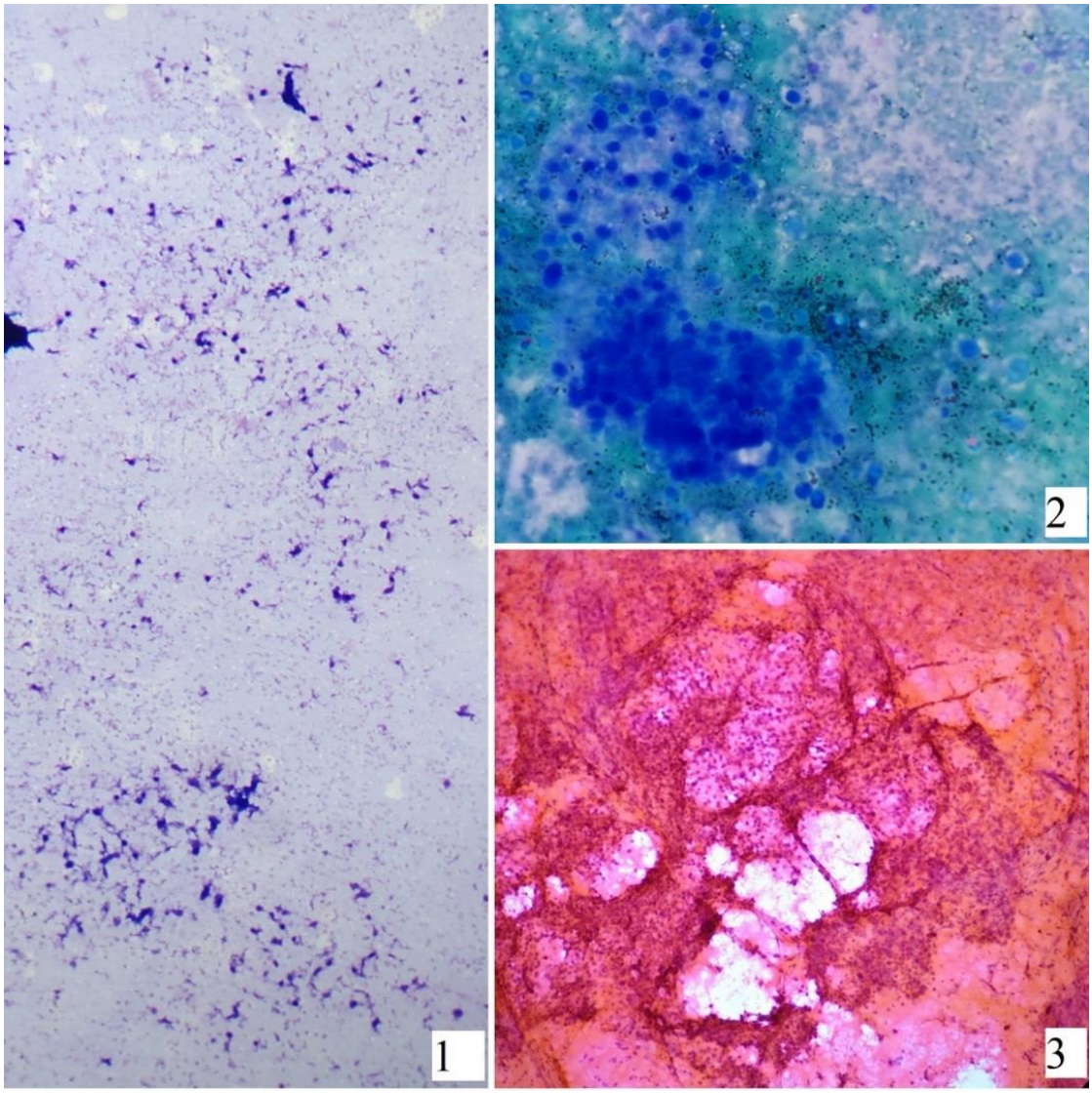

Fig. 1: FNAB smears showing poor yield of cells with some entrapped in blood clots thus obscuring their morphological interpretation

For cell block preparation, the sample was fixed in 10% formalin and incubated overnight at 37'c. Then the sample was centrifuged at 2500 revolutions per minute for 15 minutes. The supernatant was poured off and pooled plasma was added to the sediment in a ratio of 1:1. The mixture was incubated again for 5 minutes at 37'c. Uniplastin was added to the test tube in a ratio of 1:2 and the test tube was kept in a water bath for 1-2 minutes, to ensure clot formation. Once the clot was formed, it was subjected to routine histopathological tissue processing and slide staining with H&E.

Sections examined from the cell block showed monomorphic round cells having scant cytoplasm, nucleus with coarse chromatin, and prominent nucleoli along with occasional mitotic figures (Fig. 2). Hence, a diagnosis of a lymphoproliferative disorder was made.

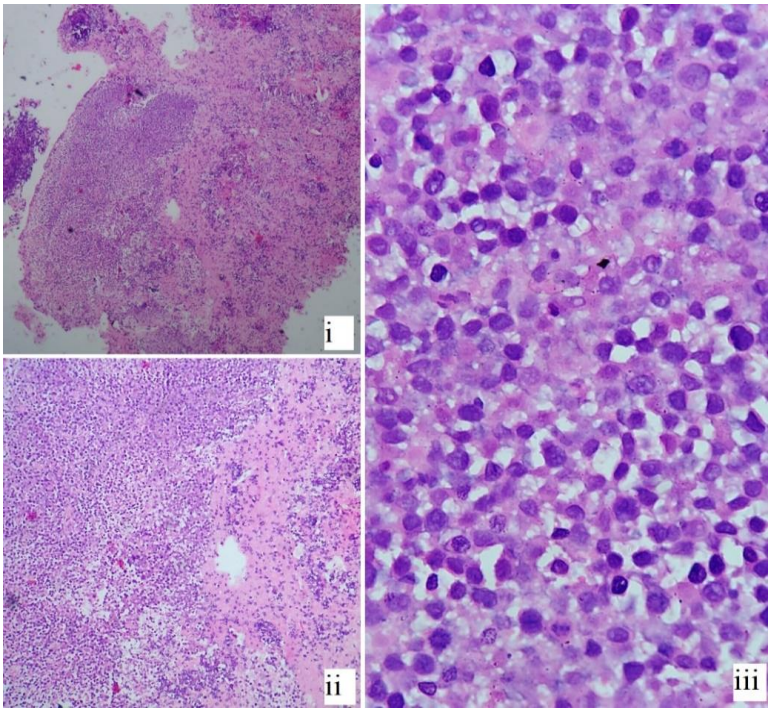

Fig. 2: Cell block section shows (i) fibro collagenous tissue with round blue tumor cells (H&E, 40x), (ii) tumor cells arranged in sheets and dispersed singly (H&E, 100x), and (iii) round to oval cells having scant cytoplasm, nucleus with coarse chromatin (H&E, 400x)

However, for confirmation, ICC needed to be performed which our cell block allowed us to do. A lymphoma panel was put (Fig. 3) which showed diffuse positivity with CD20, CD10, cMyc (40%) and negative staining with CD3, BCL2, and TDT. The histomorphology and ICC proved it to be a high-grade B cell non-Hodgkin lymphoma suggestive of a diffuse large B cell lymphoma. The patient responded well to chemotherapy and is currently under follow-up.

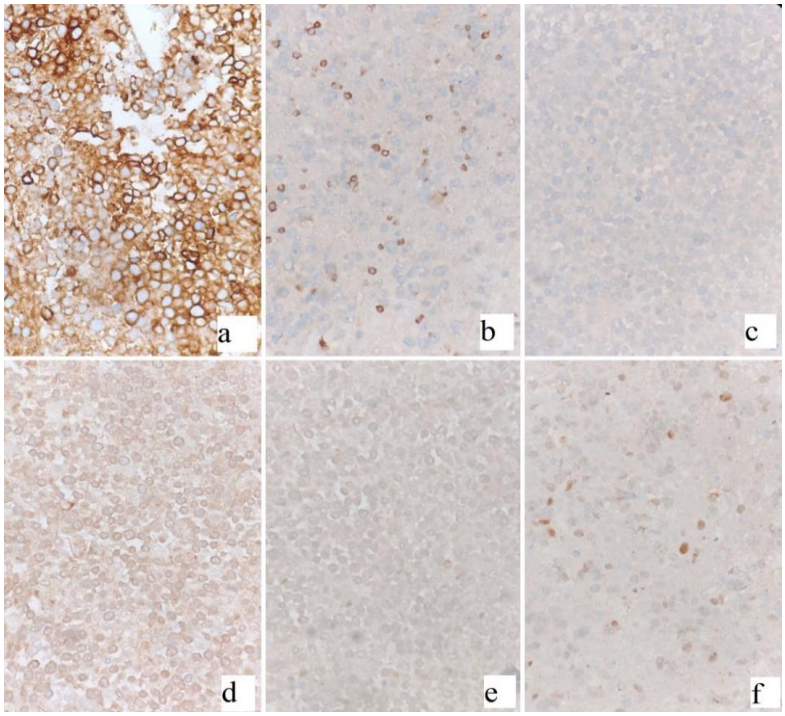

Fig. 3: ICC shows (a) CD20 Diffuse positivity (400x), (b) CD3 negative (400x), (c) BCL2 negative (400x), (d) CD10 positive (400x), (e) TDT negative (400x), (f) c-Myc positive in 40% cells (400x)

DISCUSSION

Cell block preparations made from sedimented cells can be a useful adjunct to routine cytological methods. The major difference between surgical biopsy and FNAB is that FNAB yields relatively smaller amounts of sample with partial or complete loss of histological structure, potentially resulting in its diagnostic limitations. Amador-Ortiz *et al.,* evaluated the accuracy of core needle biopsy and FNAB in conjunction with ancillary studies and found a 96.5% sensitivity, 100% specificity, 100% positive predictive value, and 90% negative predictive value for diagnosing lymphomas thus proving cell blocks in being a reliable and useful method to be utilized with FNAB [5].

Cell blocks have had historic importance for the past 20 years, but their utilization is still far from universal, owing to insufficient sample collection and complicated preparation procedures [6]. In comparison to needle biopsies, better compliance has been noted among patients due to smaller gauge needles. Koss *et al.*, suggested that the procedure should be terminated once bleeding starts to obtain optimal results and that the sample once procured can be subjected to any future correlative scientific studies [7].

As seen in our case, due to the close proximation of large vessels with the site of interest, attempting a wide bore core biopsy would still have carried greater risks of bleeding as compared to a properly done USG guide FNAB which got us adequate material to make a diagnosis and thus treating our patient.

Therefore, proper standardizing of cell block preparation and training pathologists to interpret its morphology can help in bringing this technique into regular practice and thus exploring its full potential.

CONCLUSION

Cell blocks should be considered as a reliable and useful adjunct to FNAB in diagnosing various pathologies. Hereby, with this case report, we would like to highlight the additional information that could be obtained by cell blocks over and above the routine FNAB and surgical biopsies which can be used for improving diagnosis and patient care.

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Conflicts of Interest: None.

Authors' Contributions

- **Conceptualization:** VD, AK
- **Data curation:** AK, VD
- **Critical and intellectual evaluation:** VD, AK
- **Drafting of manuscript:** VD, AK
- **Approval of final manuscript:** All authors

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