



ASSESSMENT OF DIAGNOSTIC EFFICACY IN LYMPHADENOPATHY BY FINE NEEDLE ASPIRATION CYTOLOGY AND CELL BLOCKS VERSUS HISTOPATHOLOGY AT A TERTIARY CARE HOSPITAL

Pathology

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ABSTRACT

Background- Fine Needle Aspiration cytology (FNAC) is easy to do for diagnosis of lymphadenopathy, but it does not yield sufficient information for precise diagnosis. Cell block (CB) preparation in a way mimics the histopathological sections, thus help in sub classifying various lesions. **Methods-** This was observational study with evaluation of diagnostic efficacy in lymphadenopathy by fine needle aspiration cytology and cell blocks versus histopathology at a tertiary care hospital from June 2018 to Jan 2020. **Results-** In this study, (Combined FNAC plus Cell Block) showed concordance with histopathological diagnosis in 90% cases. For Combined FNAC and Cell Block Sensitivity was 95%, Specificity was 100%, Diagnostic Accuracy was 95%. **Conclusion-** FNAC as the first line approach supplemented by Cell Block in selected cases, where the information given by FNAC is in doubt or insufficient to guide clinical management. This strategy is likely to reduce the risk of misdiagnosis and the impact of cytological pitfalls

KEYWORDS

FNAC, Cell Block, Lymphadenopathy, Histopathology

INTRODUCTION

Diagnosis of lymphadenopathy depends mainly on excision of a gland and its histopathological examination. For this, general anesthesia and hospitalization are required. FNAC, on the other hand, is safe, minimally invasive and cost-effective method is widely practiced and has proven to be a very effective means of obtaining tissue from different body sites for diagnosis. However sometimes it does not yield sufficient information for precise diagnosis and the risk of false negative diagnosis always exists. Its diagnostic efficiency is surpassed by its failure rate that has been mentioned by many to be as high as 45%.⁶ An inconclusive diagnosis on FNAC may be due to poor spreading, air drying artifact and presence of thick tissue fragments despite aspiration of adequate material.¹ Further in case of highly vascular organs like lymph node, it often yields hemorrhagic aspirate which reduces its diagnostic efficacy. In order to overcome these problems,

Cell Block (CB) technique has been resorted to make the best use of the available material. Bahrenburg¹ was the first to introduce cell block technique almost a century ago, where he used this technique as an alternative to preparation of conventional smear from ascitic fluid. Since then, the cell block has been prepared from various specimens like urine, pleural, peritoneal, ascitic and pericardial fluid as well as from tissue scrapings and hemorrhagic aspirates.

In this observational study we evaluated the role of CB as a useful adjunct to FNAC smears for establishing a more definitive cytopathological diagnosis in cases of lymphadenopathy. In addition, we evaluated diagnostic accuracy of FNAC combined with CB in lymphadenopathy against histopathology.

METHODOLOGY

This was observational study with evaluation of diagnostic test done in tertiary care hospital. Study population included all patients of lymphadenopathy coming to pathology department for FNAC. Duration of study was One and Half Years.

Inclusion Criteria: - Patients of all age groups clinically diagnosed as lymphadenopathy and coming to Pathology department for FNAC/Histopathology will be included.

Exclusion Criteria: - Patients who are not consenting to the procedure shall be excluded. Also patients who have inflamed skin/ cellulitis /infective skin lesion/patients contradicted for FNAC will be excluded. **Method of Measurement:** Assessment of FNAC, Cell Block & Histopathology of Lymph Nodes will be done by Microscopy.

Outcome Measures: Sensitivity, specificity, negative predictive value

and positive predictive value of the results of FNAC, Cell Block and Histopathology will be calculated and compared to decide which of the two tests is better for Lymphadenopathy.

Statistical Analysis: The data will be collected and entered in Microsoft excel and analyzed by Statistical Packaging for Social Science (SPSS) Software and appropriate test of significance will be value of <0.005 shall be considered to be statistically significant.

RESULTS

After carefully taking account of inclusion and exclusion criteria in account, 40 patients were studied in this study. In present study, maximum numbers of cases observed were in the 41-50 years age group. In Present study, Male to Female ratio was 1:1.1 In present study, Cervical Lymphadenopathy (60%) was most common site followed by Submandibular (20%), followed by Supraclavicular (10%) followed by Inguinal (5%) with Axillary and Submental accounting for 2.5% each.

Table 1. Case distribution as per FNAC

FNAC DIAGNOSIS	No. of Cases	Percentage (%)
REACTIVE LYMPHADENITIS	16	40%
GRANULOMATOUS LYMPHADENITIS	18	45%
METASTASIS OF EPITHELIAL MALIGNANCY	5	12.5%
NON HODGKINS LYMPHOMA	-	-
HODGKINS LYMPHOMA	1	2.5%
CASTLEMANS DISEASE	-	-
Total	40	100%

Table 2. Case distribution as per Cell Block

FNAC DIAGNOSIS	No. of Cases	Percentage (%)
REACTIVE LYMPHADENITIS	18	45%
GRANULOMATOUS LYMPHADENITIS	18	45%
METASTASIS OF EPITHELIAL MALIGNANCY	3	7.5%
NON HODGKINS LYMPHOMA	1	2.5%
HODGKINS LYMPHOMA	-	2.5%

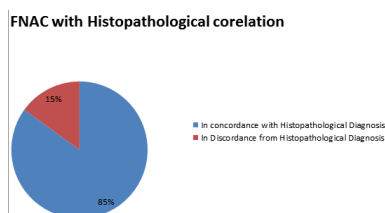
CASTLEMANS DISEASE	-	-
Total	40	100%

Table 3. Case distribution as per Histopathology

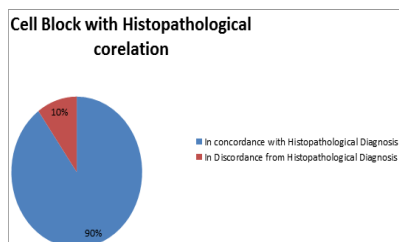
HISTOPATHOLOGY DIAGNOSIS	No. of Cases	Percentage (%)
REACTIVE LYMPHADENITIS	14	35%
GRANULOMATOUS LYMPHADENITIS	18	45%
METASTASIS OF EPITHELIAL MALIGNANCY	5	12.5%
NON HODGKINS LYMPHOMA	1	2.5%
HODGKINS LYMPHOMA	1	2.5%
CASTLEMANS DISEASE	1	2.5%
Total	40	100%

Comparison between FNAC, Cellblock and Histopathology Diagnosis was found to be statistical significant. P value after comparing tables of result of three different diagnostic modality is <0.0001, i.e. it is statistically significant.

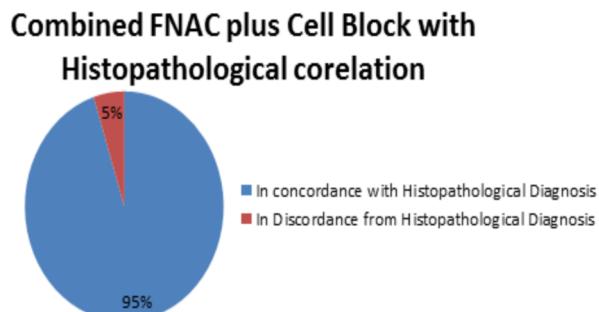
In present study, FNAC showed concordance with histopathological diagnosis in 85% cases. For FNAC Sensitivity was 83%, Specificity was 90%, Diagnostic Accuracy was 85%.

Fig. 1 FNAC with Histopathology Correlation

In present study, Cell Block showed concordance with histopathological diagnosis in 90% cases. For Cell Block Sensitivity was 90%, Specificity was 95%, Diagnostic Accuracy was 90%.

Fig. 2 Cell Block with Histopathology Correlation

In present study, (Combined FNAC plus Cell Block) showed concordance with histopathological diagnosis in 90% cases. For Combined FNAC and Cell Block Sensitivity was 95%, Specificity was 100%, Diagnostic Accuracy was 95%.

Fig. 3 Combined FNAC plus Cell Block with Histopathology Correlation

DISCUSSION

In this observational study we evaluated the role of Cell Block as a useful adjunct to FNAC smears for establishing a more definitive

cytopathological diagnosis in cases of lymphadenopathy. In present study, Maximum numbers of cases, i.e. 22.5% observed were in the age group 41-50 years. In the study by Ashwinkumar K Barsagade et al², majority of cases (32%) were found in 40-50 years. Present study showed that Male to Female ratio was 1: 1.1. In study by Divya Jyothi et al³ both the cases were found equal number of cases and ratio of male to female was: 1:1.

In present study, Cervical Lymphadenopathy (60%) was most common followed by Submandibular (20%), Supraclavicular (10%). In a study of 187 cases by Shruti Vimal et al⁴, site wise distribution was cervical (50.80%), submandibular and supraclavicular (12.30%) each, axillary, and inguinal (10%) each.

In a study by Gupta ML et al⁵, 62.5% presented with cervical lymph node enlargement, 15% presented with submandibular swelling, 10% with inguinal lymph node enlargement, 7.5% with axillary.

Case distribution as per diagnosis

Table 4. Different studies showing Diagnosis wise distribution

DIAGNOSIS	Present Study	Shruti Vimal et al ⁴	Gupta ML et al ⁵	Divya Jyothi et al ³
REACTIVE LYMPHADENITIS	35%	34%	33.33%	42%
GRANULOMATOUS LYMPHADENITIS	45%	29%	16.66%	35%
METASTASIS OF EPITHELIAL MALIGNANCY OR OTHER MALIGNANCY	12.5%	18%	11%	10%
NON HODGKINS LYMPHOMA	2.5%	2%	4.16%	9%
HODGKINS LYMPHOMA	2.5%	1%	1.66%	4%

Sensitivity and specificity of fnac with histopathology:

In the present study, sensitivity of FNAC in the various pathologies of lymph nodes was found to be 83% and specificity of FNAC was found to be 90%, similarly accuracy of FNAC was found to be 85%. A diagnostic test is considered satisfactory if its sensitivity and specificity are around 90%. In the study of 100 cases by Shailaja Prabhala et al⁶, Sensitivity of FNAC was 94% and Specificity of FNAC was 100% for the Diagnosis. In the study of 200 cases of lesion of various organ by Gupta ML et al⁵, Sensitivity of FNAC was 100% and Specificity of FNAC was 96.7%. Diagnostic accuracy of FNAC was respectively 90%.

Sensitivity and specificity of cell block with histopathology:

In the present study, sensitivity of CELL BLOCK was found to be 90% and specificity of CELLBLOCK was also found to be 95%, similarly accuracy of CELL BLOCK was found to be 90%. In the study of 100 cases by Shailaja Prabhala et al⁶, Sensitivity of cell block was 100% and Specificity of cell block was 100% for the Diagnosis. In the study of 148 cases by Revati N Patil et al⁷, Sensitivity of cell block was 98.92% and Specificity of cell block was 96.30% for the Diagnosis and accuracy was 98.33%.

Sensitivity and specificity of combined (fnac plus cell block) with histopathology

In the present study, sensitivity of Combined FNAC with CELL BLOCK was found to be 95% and specificity was also found to be 100%, similarly accuracy was found to be 95%. In the study of 360 cases by Sanjay N. Parate et al⁸, Sensitivity of Combined FNAC with CELL BLOCK was found to be 98% and Specificity was also found to be 93%, similarly accuracy was found to be 96%.

Present study showed that Combined FNAC and Cell Block increased Diagnostic yield with increased accuracy than FNAC and Cell Block alone. Study by Sanjay N. Parate et al⁸ also showed similar findings. It is important to note that sometimes FNAC or Cell Block alone sometimes confusing diagnosis.

In 2 cases in our study, FNAC co related with Histopathological findings where Cell Block yielded different cases probably due to less cellularity on Cell Block. So it is always good to do both FNAC and Cell Block for improving diagnostic yield.

CONCLUSION

The common advantage of FNAC over other biopsy methods is simplicity, speed and low cost. Cell block method allows the recovery and processing of minute amounts of cellular material and facilitates the better diagnosis of lymph node when reviewed along with cytological smears. Cell block bridges the gap between Cytology and Histopathology. FNAC as the first line approach supplemented by Cell Block in selected cases, where the information given by FNAC is in doubt or insufficient to guide clinical management. This strategy is likely to reduce the risk of misdiagnosis and the impact of cytological pitfalls.

REFERENCES

1. Basnet S, Talwar OP. Role of cell block preparation in neoplastic lesions. *Journal of Pathology of Nepal*. 2012; 2: 272-276.
2. Ashwinkumar K Barsagade et al. Diagnostic Utility of Cell Block Preparation of Fine Needle Aspiration Material. *Sch. J. App. Med. Sci.*, Dec 2017; 5(12D): 5031-5037.
3. Jyothi D, Suman S, Bhattacharya BK, et al. Clinicopathological correlation of fine needle aspiration cytology with histopathology in peripheral lymphadenopathy in patients attending a tertiary care hospital in Eastern Bihar. *J. Evolution Med. Dent. Sci.* 2016; 5(104):7654-7656.
4. Vimal S, Dharwadkar A, Chandanwale SS, Vishwanathan V, Kumar H. Cytomorphological study of lymph node lesions: A study of 187 cases. *Med J DY Patil Univ* 2016; 9:43-50.
5. Gupta ML et al. Correlation of fine needle aspiration cytology lymph node with histopathological diagnosis. *Int J Res Med Sci.* 2016 Nov; 4(11):4719-4723.
6. Shailaja P, Nitin G, Satish S. "Utility of Cell Block Technique by Microwave Processing for Rapid Diagnosis in Fluids and Fine Needle Aspirates". *Journal of Evolution of Medical and Dental Sciences*. 2014; 3(60): 13393-13401.
7. Patil RN, Mahore SD, Kolhe HS, Bothale KA, Gowardhan VP, Taori HS, Mhatre RK. Cell Block Technique: An Effective Tool in Diagnostic Cytopathology. *IOSR Journal of Dental and Medical Sciences*, 2016; 15: 99-106.
8. Sanjay N. Parate, Prajкта S. Pawar, Anjali Kakade. Role of cell block preparation in cytopathological diagnosis. *International Journal of Contemporary Medical Research* 2019; 6(7):G26-G31.