ORIGINAL RESEARCH

Comparative Analysis of Cell Block Method and Smear Examination in FNAC Aspirates for Diagnostic Utility in Tertiary Care Centre, Jaipur, Rajasthan

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ABSTRACT

Introduction: Fine needle aspiration (FNA) cytology, which provides a very quick preliminary diagnosis with no harm to the patient and at a far cheaper cost than surgical biopsy, is commonly utilized in the analysis of lesions from diverse body sites. The ability to quickly and accurately diagnose with little invasiveness with FNAC is crucial.

Materials & Methods: All patients with clinically enlarged peripheral swellings who presented to the pathology department are included. All FNAC samples of enlarged peripheral swellings were used to prepare air dried and alcohol fixed CSs to be stained with MGG stain or H&E stain respectively and to prepare CB by Plasma - Thromboplastin method and the sections were stained with H&E and specific stain as per diagnostic requirement.

Results: A total of 51 patients were enrolled in this study between the Age of 10 to 90 yrs. The mean age of present study participants was 46.27± 18.43 year and cases within the age range of 46-60 years (31.4%) constituted the largest group. In the Conventional smear benign cases were 23.5% while in CB it was 21.6% observed. Malignancies were found in 37.3% while in CB it was reported 25.5%. This distribution was statistically significant (p value<0.05).

Conclusion: The current study conclude that CS has a good correlation with malignant lesions, with adequate cellularity, clear visibility of nucleus and cytoplasm and well-preserved architecture. However, blood obscuring and cellular degeneration is encountered more frequently. CB can hence be used as a supplement in arriving at an accurate diagnosis.

Key words: FNAC, Conventional Smear, Cell Block.

INTRODUCTION

Fine needle aspiration (FNA) cytology, which provides a very quick preliminary diagnosis with no harm to the patient and at a far cheaper cost than surgical biopsy, is commonly

utilized in the analysis of lesions from diverse body sites.[1]The ability to quickly and accurately diagnose with little invasiveness with FNAC is crucial.[2,3]With FNAC, there is always a danger of receiving a false-negative or inconclusive diagnostic, and it occasionally fails to provide information for a clear diagnosis.[4] Cell Block (CB) preparations may be useful in these circumstances. To create a CB, several pieces of the same material can be purchased and stained using common methods like H & E, which is a condensed collection of cells made from a fine needle aspirate material that is fixed and embedded in paraffin.[5] It can be especially helpful to classify cancers since this may not be available from smears alone.[6]
For peritoneal fluids, pleural, FNA, bronchial washings, and few other cytological specimens, CB preparations are frequently utilized. There are a number of ways to prepare CB which are embedded in paraffin from FNAC, including direct transfer of all centrifuged cellular material wrapped in lens paper[7]or embedding in plasma or agar and processing as a typical histological specimen.[8]Thus, this study aimed at assessing the utility of CB in increasing the accuracy of cytodiagnosis of fine needle aspirates of lesion from various body sites.

MATERIALS & METHODS

The present study includes all the fine needle aspiration samples (FNA), received in the Department of pathology at JNUIMSRC from 01 January 2021 to 31October 2022. All patients with clinically enlarged peripheral swellings who presented to the pathology department are included.
A written consent was taken before performing the procedure. All FNAC samples of enlarged peripheral swellings were used to prepare air dried and alcohol fixed CSs to be stained with May-Grunwald-Giemsa stain or H&E stain respectively and to prepare CB by Plasma - Thromboplastin method and the sections were stained with hematoxylin and eosin and specific stain as per diagnostic requirement.
The diagnoses were categorized as Benign, Malignancies, Other Infections/ Inflammation, Suspicion of Malignancy, Tubercular and Inconclusive. A comparative evaluation of CS vs. CB was conducted. Data were analyzed using SSPS 20 software. Data were presented in the form of frequency, mean, standard deviation and graphs. Comparison of qualitative variables were done using chi square or fisher's exact test whenever necessary. Comparison of quantitative variables were done using t-test. Significance was considered if p value is less than 0.05.

RESULTS

Atotalof51patientswereenrolled in this study who were having clinically enlarged peripheral swellings visited to Pathology department between the Age of 10 to 90 years at Jaipur National University Institute for Medical Sciences & Research Centre, Jaipur from Jan 2021 to Oct 2022. The mean age of present study participants was 46.27± 18.43 year and cases within the age range of 46-60 years (31.4%) constituted the largest group. In the present study, 51 % participant were female and 49% were male. All the FNAC cases were screening by conventional method & Cell block (CB) technique.
In the Conventional smear benign cases were 23.5% while in CB it was 21.6% observed. Malignancies were found in 37.3% while in CB it was reported 25.5%. (Fig.1) the abundant background blood was present in 27.5% in CB compared to 0.0% in smear. This distribution was statistically significant (p value<0.05). (Fig.2)
The Mean score of smear & cell block were calculated by SPSS software ver. 21.0 were blood obscuring, diagnostic material, cellular degeneration & architectural preservation parameters were found significant below p <0.05. (Table.1)

Fig1: Correlation of Convention smear & Cell Block

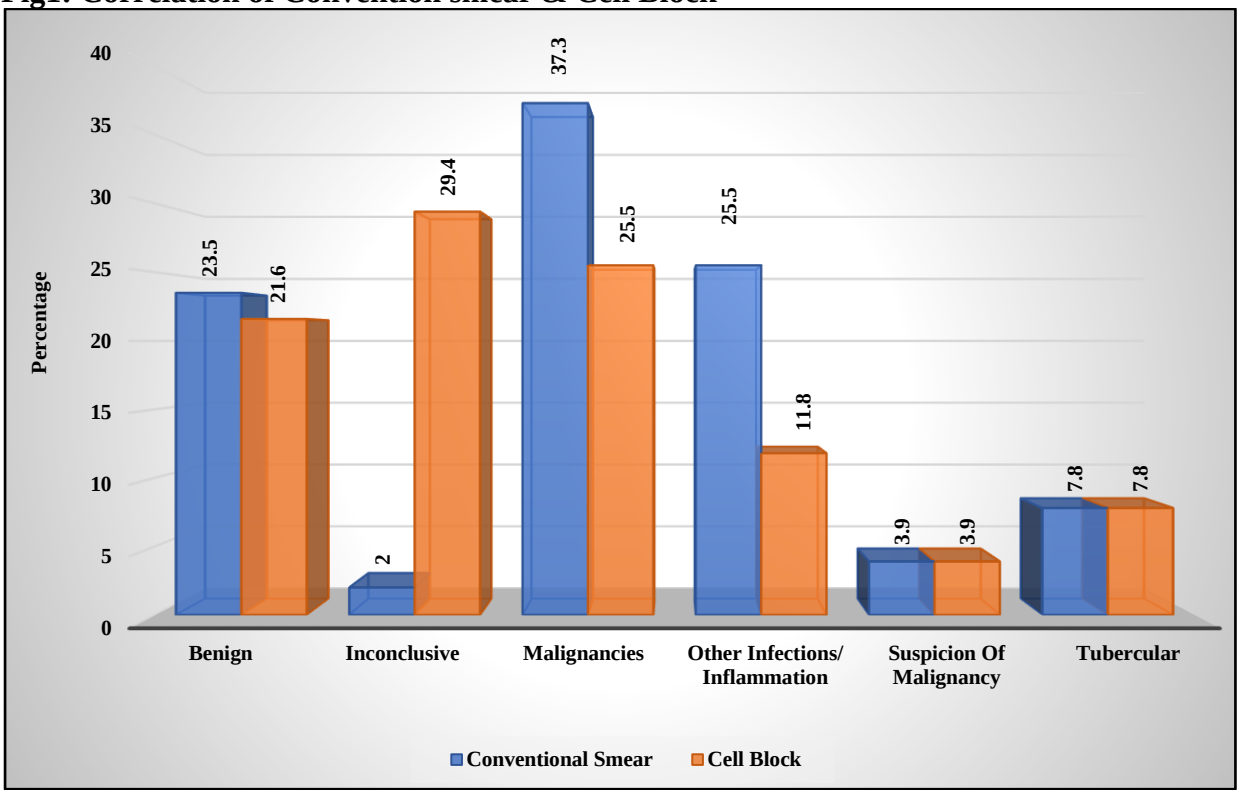
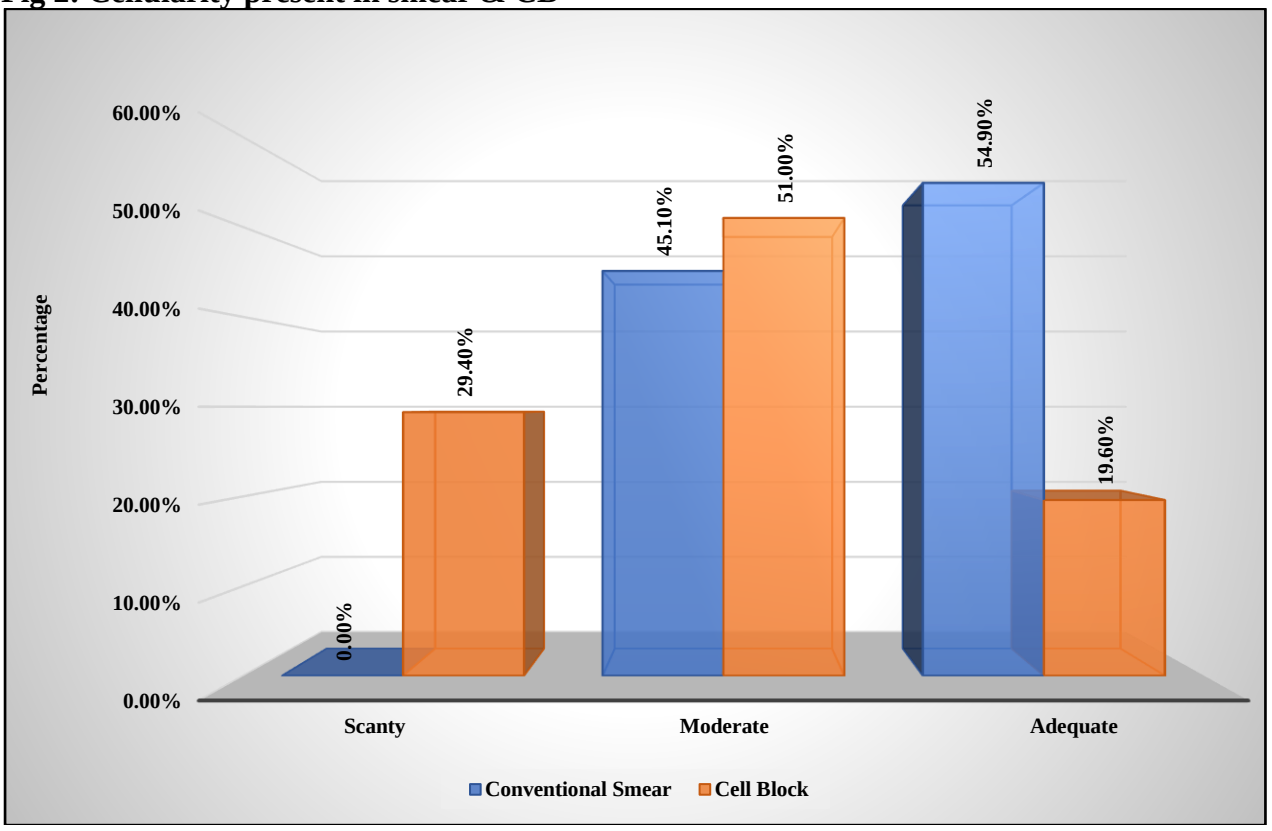


Fig 2: Cellularity present in smear & CB



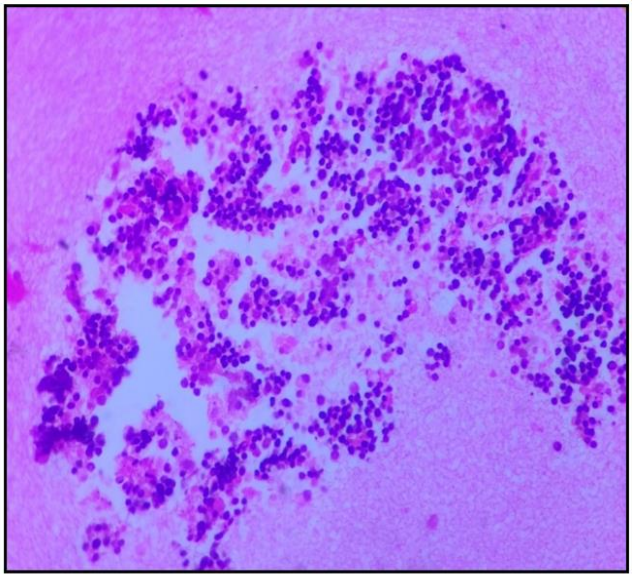


Fig 3A Small Cell Carcinoma on Cell Block (H & E 400x)

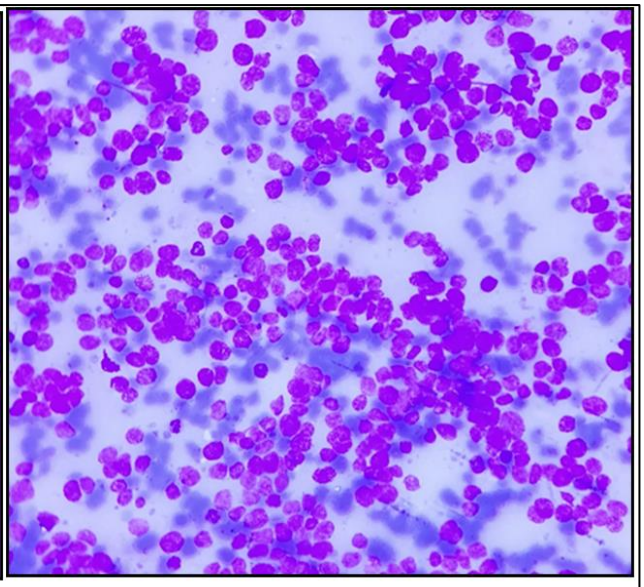


Fig 3B Small Cell Carcinoma on FNAC smear (MGG, 400x)

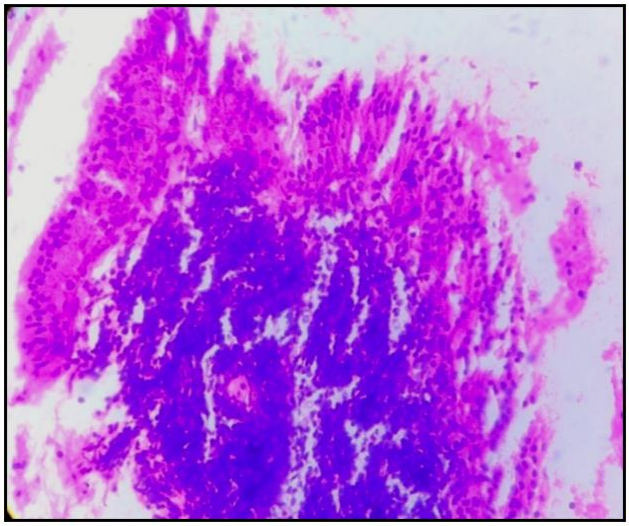


Fig.4A Warthin tumor on Cell Block (H& E 400x)

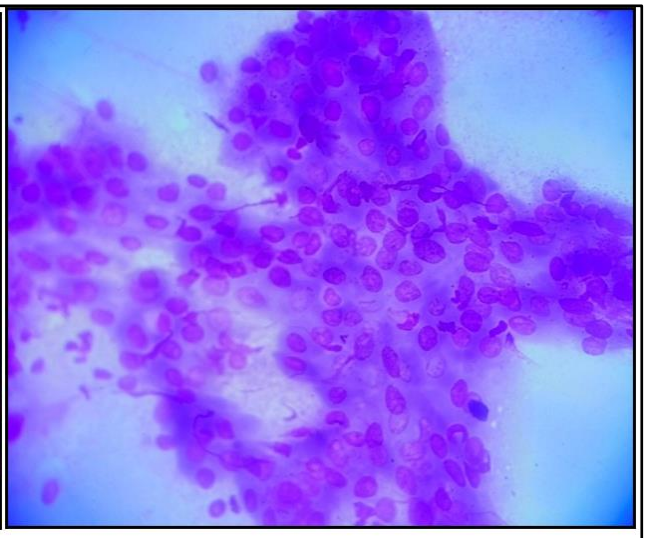


Fig. 4B Warthin tumor on FNAC smear (MGG, 400x)

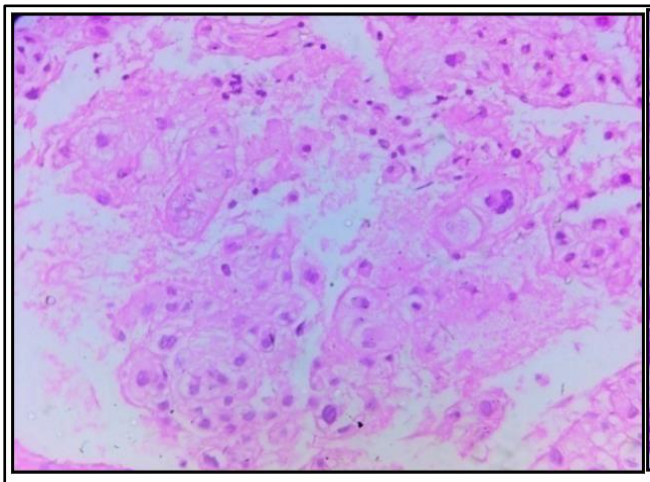


Fig. 5A Chordoma (aggregates of physaliphorous cells) on Cell block

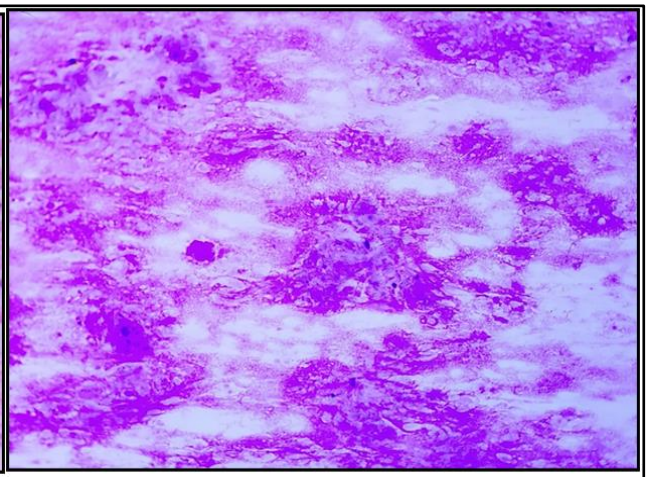


Fig. 5B Chordoma on FNAC smear (MGG, 400x)

Table 1: Mean score for smear and Cell block

	CS		CB		P value
	Mean	SD	Mean	SD	
Blood obscuring	1.25	0.44	0.92	0.69	0.004
Diagnostic material	1.55	0.50	0.90	0.69	<0.001
Cellular degeneration	1.63	0.48	1.12	0.83	<0.001
Architectural preservation	1.53	0.54	1.04	0.79	<0.001

DISCUSSION

Simplicity, cost effectiveness and high accuracy have made smear prepared conventionally from FNA acceptable by pathologists and clinicians. However, there are certain limitations such as mimicking malignancy by degenerative and inflammatory cells; loss of histological architecture and difficulty in cytological diagnosis.

The mean age of our study participants was 46.27±18.43 year. Age distribution ranged from 10 to 87 years. In our study, most of the cases were of age group 46-60 years (31.4%) followed by 31-45 years (25.5%), while > 60 years were the least (19.6%).51 % of cases were female. Which was in an agreement with Batra et al[9] observed a maximum number of cases with 41-50 years and 51-60 years (28%). Male: female ratio is 1.2:1 which indicates a greater number of males. Shekhar H et al[10]in which cases were of age, 1 to 75 years, and 57% were males. Majority were of age group 31 to 40 years.

In the present study malignancies were found in 37.3% of CSs compared to 25.5% of CB while benign lesions were seen in 23.5% and 21.6% respectively. 29.4% cases were inconclusive in CB in contrast to only 2% in CS. Thus, CSs are better in diagnosis of malignant lesions than CBs. Present study was in an agreement of Bhanvadia VM. et al[11]and Miachieo N et al[12], who also observed that the percentage of diagnosis of benign lesions were almost similar with both methods. However, in diagnosis of malignant lesions, in contrast to our study they found CB to be superior to CS. 4 aspirates in both the methods were tubercular. This has not been assessed in previous studies for comparison. More number of samples in the CB, 15 were inconclusive, in contrast to only 1 in CS.

In the present study 12 cases to CS and 11 cases were labelled benign by CB method respectively. By CB method, 13 cases were malignant. Out of the 12 cases with benign lesion, 11 cases correlated with diagnosis in both the methods while 1 case was inconclusive in the CB. In 2 cases there was a suspicion of malignancy by both the methods.6 cases were diagnosed under 'Other Infections/ Inflammation' in both the methods, while 7 diagnosed as inconclusive by CB were included in this category by the CS. An additional 6 cases diagnosed as inconclusive in CB proved to be malignancies in CS. This finding is contradictory to Bhanvadia VM. et al[11] findings who observed additional10% diagnostic yield with CB, while studies done by Richardson et al[13], Liu et al[14] showed 12% and 12%respectively had increased diagnostic yield.

CONCLUSION

The current study shows that CS has a good correlation with malignant lesions, with adequate cellularity, clear visibility of nucleus and cytoplasm and well-preserved architecture. However, blood obscuring and cellular degeneration is encountered more frequently. CB can hence be used as a supplement in arriving at an accurate diagnosis. It is evident from the current study that CSs are comparatively superior to CB either for adequate cellularity or for categorization of lesion, and to sub type a malignant lesion, CB are helpful. Hence, CBs are done routinely not only to complement the diagnosis but are essential for fine-needle cytology. This suggests that CS and CB should be complemented with each other than considering them as alternatives.

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