Survey Report

iMedPub Journals
www.imedpub.com

Insights in Biomedicine
ISSN 2572-5610

2017
Vol.2 No.4:19

DOI: 10.21767/2572-5610.100035

Cytopathology: Addenda, Ancillaries, Adjuvants and Auxiliaries

Bajaj A*

Department of Histopathology, A.B. Diagnostics, A-1 Ring Road, Rajouri Garden, New Delhi-27, India

Received: December 01, 2017; **Accepted:** December 28, 2017; **Published:** December 29, 2017

***Corresponding author:** Dr. Anubha Bajaj

anubha.bajaj@gmail.com

Consultant, Department of Histopathology A.B. Diagnostics, A-1 Ring Road, Rajouri Garden, New Delhi-27, India.

Tel: 91-9811693956, 00911141446785

Citation: Bajaj A (2017) Cytopathology: Addenda, Ancillaries, Adjuvants and Auxiliaries. Insights Biomed. Vol.2 No.4:19

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Multitudinous cytologic (the science that deals with formation, structure and function of cells) techniques have been appraised to gather abundant and sufficient cell material for primary diagnosis and adjuvant analysis.

Direct smears (i.e. the study of cellular morphology after the fine needle aspirates are dabbed onto a glass slide,) for the ancillary procedures are an authority for molecular, fluorescent *in-situ* hybridization (FISH) and archives and storage. Cell blocks are not always satisfactory to bring off additional essays. A single, high quality needle pass is more corroborative than subsequent needle passes diluted with peripheral blood, which are of not much advantage for configuring cell blocks. Aspirated material on direct smears are superior to cell blocks for recording infection using special stains such as Gram's stain, Ziehl Neelsen stain (Acid Fast Bacilli), Gomori Methenamine Silver etc. and with regular stains such as Papanicolaou and Diff Quik. The special stains yield a greater number of organisms with an exclusive morphology in contrast to the identical cell blocks. The branching, septate fungal hyphae are also effortlessly displayed in the direct smears vis-a-vis cell blocks. Sample submission for microbiological culture alongwith a provision of unstained direct smears for routine and special micro-organism staining is also beneficial with a high-quality pass as opposed to cell blocks [1].

Liquid based cytology (a method in which the head of the plastic spatula used to obtain the cells is inserted directly in the vial with the cellular preservative and then centrifuged to form a pellet of cells for display on the glass slide to examine for evidence of cellular atypia/ frank malignancy) is a substitute to customary practices and preparations. The thin prep (a modified technique designed to reduce the technical problems inherent in the conventional cell processing, with the use of a special brush/fluid, the cells filtered out and deposited in a thin monolayer onto the glass slide) is widely accepted in the non-gynae cytology of specimens such as pleural/ ascitic / pericardial fluids, urine cytology, brush cytology of Gastro-intestinal tract, Lung etc and standard Fine Needle Aspiration. The results are comparable or exceptional with Thin Prep groundwork vis –a vis accustomed processing in the non-gynae subspeciality, with the remaining vial cells being utilized for DNA analysis, immunocytochemistry and ancillaries. Thin Prep is now also acclaimed and extensively adopted for gynae cytology and is preferred over the traditional and time-tested Papanicolaou smear for the detection of squamous intra-epithelial lesions (LSIL and HSIL). For sample satisfactoriness, for tracking down the atypical cells, for diagnosis of cervical cancer and its precursor lesions, the availability and consistency of the Thin Prep is further sought than the habitual Papanicolaou smear. The advantageous acquisition of cells in a liquid medium provides the liberty to augment the standardized Papanicolaou smear with upgraded approach for Human Papilloma Virus and another agendum. There is elevated determination for priorities of patients with cervical aberrancies **(Table 1).**

The techniques of cell blocks (A paraffin block suitable for sectioning, staining and microscopic study, prepared from a cell suspension in fluid, concentrated by centrifuge or filter paper and processed as a solid specimen of tissue) have the capacity to visualize the lesion directly, and monitor the pureness of the aspirate, can also be passed on for ancillary investigations, however the sample capacity cannot be reviewed. Deep cuts of cell blocks can be used for molecular array without direct inspection [2].

Direct smears of fine needle aspiration can also assess the pathology, give a correct competence and the unsullied response, but the number of smears to be used for adjuvant testing is limited.

Fresh, frozen, centrifuged sample is amenable to suitableness, audit and can be used for ancillaries, but cannot be visualized directly or used to scrutinize the cleanness of the sample.

Table 1 Determination for priorities of patients with cervical aberrancies.

Facility	Direct View	Suitableness	Decipherability	Sample allocation
Cell Blocks	Yes	No	Yes	Yes
Direct Smears	Yes	Yes	Yes	Yes, Limited
Fresh Frozen	No	Yes	No	Yes
Thinprep/Cytospin	Yes	No	Yes	Yes, Limited
Filter Paper (Whatman)	No	Yes	No	Yes

Thin prep and cytospin samples can be called to mind, are partially capable to be used for auxiliary testing, are immaculate samples, but have no capacity for evaluation of suitability.

Filter paper (Whatman-cells dabbed and adherent to the filter paper) sampling cannot be observed or checked if are lucid but can be availed for adjuvant examination and detected if requisite.

Molecular techniques of ancillary cytological testing also flourish in the generation of exemplified medicine. These are Polymerase chain reaction, flouroscent *in situ* hybridization, flow cytometry, conventional cytogenetics, immunocytochemistry etc. These are useful in a variety of existing modalities such as direct smears, cell blocks, filter paper repository, frozen specimens and cellular improvement methods such as Thin Prep and Cytospin. Direct smears exude excellent cellular and DNA preservation, are easily prepared, can be evaluated for cellular competence at the time of performing the procedure and subsequently for assaying cellular cleanness. Direct smears are also the most effective, cost effective, optimal and dependable specimens for a depot of cytologic material for ensuing molecular assays. Cell blocks cannot be evaluated at the time of performing the fine needle aspiration and are often deficient. Filter paper and frozen section do not allow the determination of immaculate specimens.

The benefit and aspect of fine needle aspiration, to achieve target DNA from palpable and non-palpable lesions, is i) Larger areas and amount of sampling ii) Clean samples with a cellular predominance and a paucity of stroma iii) Quick procedural analysis, a preliminary diagnosis which can be communicated. iv) Localized, site-specific material collection for auxiliary corroboration with PCR, FISH, Immunocytochemistry, conventional cytogenetics, Flow Cytometry, molecular analysis and microbiological culture [3].

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