

Fellowship in Cytopathology

Department of Pathology



All India Institute of Medical Sciences (AIIMS)
Jodhpur, Rajasthan, India

Syllabus for Fellowship in Cytopathology:

FNAC -Direct, Guided, EUS

Exfoliative Cytology

Special techniques

ROSE

Classification systems for categorizing lesions in Thyroid, Cervical smears, Salivary Gland and Urinary cytology

Proficiency testing

Automation

Interpretation and Troubleshooting

1. Methods of preparation of fluids for microscopic examination:
 - a. Preparation of direct or sediment smears
 - b. Cyto-centrifuge preparation
 - c. Preparation with LBC
 - d. Processing of haemorrhagic fluids
2. Special staining techniques for bacteria, acid fast bacilli, mucin, glycogen, amyloid, crystals, pigments like Iron and Melanin.
3. Enzyme cytochemistry
4. Different staining techniques for sex chromatin.
5. Case based and Problem based approach for learning, Interpretation and Trouble shooting
6. Correction of technical errors in preparation and staining of cytological smears.
7. Methods of disinfection, cleaning of glassware/laboratory equipment used in collection and processing of specimens, sterilization of equipment/instruments/syringes and needles/solutions for special laboratory use. Preparation of distilled water, saline and buffers commonly used for special cytological techniques.
8. Methods of specimen collection and checking adequacy by ROSE:
Cervical smear or hormonal cytology, Pleural and pericardial tapping, Vaginal smear or hormonal cytology, Vault smear, Method of sputum induction in cases with non-productive cough, To see the endoscopic procedures for collection of brush cytology specimens, Principles of technique of fine needle biopsy
9. Use of various techniques in cytodagnosis:
 - a. Light microscope
 - b. Fluorescent microscope
 - c. Liquid based cytology (LBC -SurePath)

- d. Cell block
- e. Immunocytochemistry
- f. ROSE
- g. Biochemical analysis of fluids (Proteins, Sugar, LDH levels, ADA, A:G ratio, Chlorides etc)

Practical diagnostic experience:

1. Cervical cancer screening:

- a. Identification of normal, inflammatory, metaplastic dysplastic and malignant cells
- b. Identification of specific infection: *Trichomonas vaginalis*, *Candida*, *Actinomyces*, *Herpes* etc.
- c. Identification of cells foreign to cervix
- d. Hormonal cytology: calculation of hormonal indices and its interpretation
- e. Identification of benign and malignant cells (Pap smear, vault smear etc)
- f. Triaging according to HR-HPV status

2.

- a. **Respiratory**-sputum, bronchial wash and bronchial brush, imprints, broncho-alveolar lavage (BAL)
- b. **GIT**: oesophageal/gastric/rectal brush cytology and imprint cytology smears (EUS Guided etc.)
- c. **Oral** cavity, oral scrapings
- d. **Effusions**: pleural, pericardial, peritoneal, synovial etc
- e. **Miscellaneous** body fluids: CSF and other body fluids (Cyst fluids, POD)
- f. **Urine** for malignant cytology

3. Special techniques: Cell block, Cytochemistry and immunocytochemistry

4. FNAC:

- a. All superficial palpable lesions eg. Lymph nodes, Breast, Salivary Gland, Thyroid, Soft tissue lesions etc.
- b. Guided FNA: Ultrasound guided for abdominal and pelvic organs including renal, ovarian, nodal masses, intestinal masses, retroperitoneal lesions
- c. Guided FNA: scan and fluoroscopic guidance lung and other deep seated organs

5. Brain and spinal cord aspirates, Imprint and squash smears

6. Prostate

7. Lung (TBNA , EBUS FNA etc)

8. Per rectal and per vaginal FNA

9. Liquid based cytology (Gynec and Non-Gynec)

Tutorials and Discussions:

Female Genital Tract:

- a. Anatomy, embryology, histology and physiology of female genital tract
- b. Cytology of female genital tract and normal vaginal flora

- c. Inflammatory lesions of vagina and cervix
- d. Adequacy criteria for CP and LBC, Changes in classification (Recent Bethesda 2014)
- e. Cytology of benign epithelial disorders of uterine cervix and vagina
- f. Precancerous and cancerous lesions of cervix
- g. Effect of therapeutic procedure such as radiotherapy and drugs on epithelium of FGT
- h. Significance of cervical cancer screening

Respiratory Tract:

- i. Histology and cytology of normal respiratory tract
- j. Lung cancer and methods for cytodiagnosis
- k. Cellular abnormalities due to benign disorders of respiratory tract
- l. Adequacy criteria for various specimens
- m. Cyto-morphological characteristics of primary vs. secondary lung cancer
- n. Prognostic markers in Lung cancer, RT-PCR based molecular detection from various samples in NSCLC
- o. Importance of lung cancer screening and accuracy of pulmonary cytology

Urinary Tract:

- p. Anatomy, histology and cytology (normal urine)
- q. Etiopathogenesis of bladder cancer and role of urinary cytology in diagnosis of bladder cancer and cancer of other sites
- r. Adequacy criteria and Paris Classification
- s. Cytology of urothelial cancer

Effusions:

- t. Anatomy, histology and cytology of pleural, peritoneal and pericardial cavities
- u. Session on synovial fluid including crystals, String test etc.
- v. Benign and malignant cells in effusions

Gastrointestinal Tract

- w. Anatomy, histology and normal cytology
- x. Cytology of infectious lesions, malignant tumours
- y. **(US Guided and EUS):** FNA of the Liver, Gall bladder, spleen, pancreas etc.

Cytology of cerebrospinal fluid with special tests.

Aspiration biopsy and cytology -general principles of techniques and cytodiagnosis, Special tests available

Breast and nipple secretions:

- y. Anatomy and histology of breast
- z. Cytology of nipple secretions and breast aspirates
- A1. Common lesions and pitfalls

Thyroid:

Adequacy criteria for Direct and Guided, The Bethesda Classification for reporting, Changes in current AJCC 8th Edition, Platforms for triaging of Thyroid FNA specimens
Correlation with clinical and radiological parameters
Benign and malignant lesions.

Lymph Nodes: Benign, infective and non-infective lesions, Triaging for culture / special studies, malignant lesions including metastasis. Taking material for Cell block, ICC, special stains

Salivary Gland Cytology: Recent advances, Milan Classification, Cytohisto correlation, Pitfalls

FNA of small Blue Round Cell Tumours

Kidney and adrenals.

Cytology of Male and Female Genital organs (Ovary and testis) including prostate and seminal vesicles.

Soft tissues: Benign and malignant lesions.

Brain and spinal cord -Squash smears and imprint cytology -Infections, Benign and malignant tumours.

Sex chromatin and chromosomal abnormalities in cancer.

Others:

Advance techniques in cytology.

Molecular testing in NSCLC

Workflow and Cytology laboratory organization.

Quality Improvement and Quality Indicators in Cytology

Automation in cytology laboratory.

Application of flow cytometry and image analysis.

Proposed time to be spent:

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| 1. Direct FNAC (Clinic everyday) | 6 months |
| 2. Exfoliative cytology | 3 months |

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| 3. Histopathology with Cyto-Histo correlation | 1 month |
| 4. Diagnostic and Interventional Radiology | 15 days |
| 5. Haematology | 15 days |
| 6. Biochemistry and Microbiology | 15 days |
| 7. Flow cytometry and Image Analysis | 15 days |

The fellow will have to:

1. See 20 cases of quality analysing and discussing which will be certified by the faculty of the department.
2. Present at one regional and one national conference.