Imprint cytology: an appraisal

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Abstract

A correct diagnosis helps in starting the specific therapy in time, thus reducing morbidity and mortality. FNA, imprint cytology are now rapid diagnostic tool in the armamentarium of clinicians. Imprint cytology is simple and rapid technique for tissue diagnosis. Imprint is a touch preparation in which tissue is touched on the slide and it leaves behind its imprint in the form of cells on glass slide; studies are made after proper staining. Diagnostic cytology is the science of interpretation of cells derived from human body, which either exfoliates freely from epithelial surface or removed from various sources by artificial means.

Keyword: Diagnostic cytology, Imprint cytology, Touch preparation.

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Introduction

The intraoperative diagnostic accuracy of a tumor is an essential part in patients' work-up. Intraoperative diagnosis of surgically removed specimens can be achieved by gross examination with the help of frozen sections & or cytologic examinations. Various cytologic techniques including imprint, fine needle aspiration, and image guided aspiration cytology; squash smears and scrape cytology may be used for intraoperative evaluation of tumors & surgical margins.[(1)]

Origin of cytology dates back more than a century, for over 100 years the discipline of anatomical pathology has centred on diagnostic histopathology. Imprint cytology is simple and rapid technique for tissue diagnosis. Imprint is a touch preparation in which tissue is touched on the slide and it leaves behind its imprint in the form of cells on glass slide; studies are made after proper staining. Diagnostic cytology is the science of interpretation of cells derived from human body, which either exfoliates freely from epithelial surface or removed from various sources by artificial means.[(2-5)]

A correct diagnosis helps in starting the specific therapy in time, thus reducing morbidity and mortality. FNA, imprint cytology are now rapid diagnostic tool in the armamentarium of clinicians. Probably the most influential person in the development of modern clinical cytology was George Papanicolaou. The relative ease (for the surgeon and the pathologist) of collecting a surgical biopsy specimen and the fear that cytology might result in a false-positive or false-negative result caused it to be viewed with extreme skepticism.[(6-8)]

In benign conditions the cells appeared in clusters but were readily identifiable and diagnosed correctly.[(9)] Imprint from malignant lesions required less pressure and smears were hypercellular than benign lesions. Mitotic Figures though less in number in imprint and scrape smear as compared to corresponding paraffin section malignant lesions because cells in mitosis tend to rupture during imprinting. Considering the accuracy observed by different workers, imprint and scrape smear are employed as adjuvant to histopathological study, it will be extremely useful in arriving the correct diagnosis. There are some points to improve the accuracy[(10)]

1. The tissue surface to be imprinted should be flat and there should be no portion of fat protruding from the edges as these tend to smudge the imprints.
2. Sometimes the first imprint contained excess tissue fluid and blood and it was found that subsequent imprints gave better cytological results and third smear was found to be the best.
3. The case with which any tumor gets imprinted varies considerably. In order to obtain imprint nearest to one cell thickness, the amount of pressure applied at the time of imprinting therefore varied. Benign looking lesions usually required more pressure in order to obtain sufficient cells for diagnosis while malignant tumors get imprinted more easily.

Technique for Imprint Smear

The imprints were prepared according to technique described by Tribe (1973):

(i) Slides properly labelled by glass marking pencil.
(ii) After sectioning, the areas suggestive of disease were gently touched with dry gauze to remove blood on the surface.

(iii) Slide were then gently touched on the freshly cut surface of the specimen, avoiding a gliding movement. Pressure applied for imprinting varied with the consistency of the specimen.
(iv) Smears were quickly fixed in 95% alcohol in order to avoid air drying artefact and stained with a variant of Papanicolaou's-stain.

The accuracy of the imprint method was assessed by comparing the imprint diagnosis with the corresponding paraffin section diagnosis.[11,12]

Uses [13]

- Useful in determining the surgical resection margins.
- Extensively used in the diagnosis of benign and malignant lesions.
- In tumors such as meningiomas, gliomas imprint cytology plays a major role.
- Imprint cytology provides good results without any difficulties in basal carcinomas of the skin.
- Sarcoma occurring in the alveolar soft part also imprint cytology has been useful.
- An accurate diagnosis is provided in the diagnosis of metastatic tumors.
- Imprint cytology is used as a diagnostic tool in the study for assessing the salivary gland tumors such as mixed parotid tumors, pleomorphic adenoma and mucoepidermoid carcinoma.

Advantages[1]

- The procedure for imprint cytology can be done even in underdeveloped infrastructure and deficient trained technician.
- Analysis of an individual cell is performed by imprint cytology.
- It provides an immediate result with minimal artifacts,
- It is cheaper and so it is most commonly used.
- A precise diagnosis is received through this technique.

Disadvantages[13]

- The depth of infiltration cannot be analyzed with imprint cytology.
- Tumors and well-differentiated tumors with dense fibrous stroma cannot be interpreted through this method.

Conclusion

Imprint cytology plays a significant role in the quick diagnosis of the lesion. It provides crisp cytological details. Cost effectiveness, rapid results and simplicity are the further criteria promoting it to be a better option when compared with other techniques such as frozen sections.

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