Case Review

Grading of Breast Tumours on Smear Cytology

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FNA Cytology has been a well accepted outpatient procedure for preoperative breast lesions. At the upfront it is adopted to delineate the benign and malignant lesions. It is satisfactory, sensitive and specific and well accepted by patients as well as surgeons [1]. A study undertaken in our institute, also considered the recommendations of the Bethesda conference, looked at the aspirate for five categories: Unsatisfactory smears, benign, atypical/intermediate, suspicious for malignancy and malignant. However the emphasis was put on the features such as, Cellular morphology and arrangement, nuclear character, number of mitosis, and background. It is well experienced that the number of epithelial cell clusters could be an important factor in lowering the false-negative diagnosis rate in all breast lesions. Discriminate analysis showed that the features with the closest correlation with histological grade were nuclear diameter, nuclear pleomorphism and the presence of nucleoli. A scoring system based on these three parameters enabled the classification of tumors into high moderate or low grade. It was appropriately suggested that a cut-off of six epithelial cell clusters may be considered as a satisfactory aspirate to avoid false-negative FNAC smears and an increased rate of rejection as inadequate smears [2]. Nevertheless, there are hindrances that need to be resolved. The heterogeneous nature of breast tumors, variable areas of necrosis, inflammation, and the variability of mixed and complex tumors are the few to enumerate [3]. The current challenge of molecular and genetic diagnosis of breast carcinoma is the need of the day. These issues put FNA on the back seat and have always made an ambiguous mark on the cytological diagnosis of tumors with the possibility of false-positives and false-negatives [4].

There are 08 research papers proposing new methods of grading breast FNA smears were published between 1980 and 2006, introducing different new aspects of scoring and grading. All the grading methods were developed for the most common type of breast cancer that is, infiltrating duct carcinoma -Not Otherwise Specified (IDC-NOS).

In our study the cytological grading is based on all the morphological features which exhibit objectivity, reproducibility, and authenticity of the particular report. The National Cancer Institute, Bethesda sponsored a conference on the "Uniform approach to report breast fineneedle aspiration biopsy," recommended that tumour grading on FNA material should be incorporated in cytology reports for prognostication, which also would correspond closely to the grading system used in the histological diagnosis [5,6].

Still there are lesions which are difficult to label as Grade I in cytology as close to histomorphological Grade I IDC. These at most can be qualified as indeterminate lesions, such as carcinoma in-situ or benign atypical ductal hyperplasia. In the present study additional morphological features are found to help to improvise the cytological grading into an efficient diagnostic tool for breast lesions. A few key factors have been added that may be considered to evolve an efficient protocol for the cytological grading of these lesions. At this point in time it may be emphasised as nuclear morphology is the mainstay of grading, therefore we found Papanicolaoustained smears more suitable for the purpose of grading, however in this study Leishman Giemsa was used in most cases and found equally good results.

As we tried to put the emphasis on nuclear morphology, Hunt., *et al.* in 1990 and Fisher., *et al.* had also proposed a scoring scheme for the nuclear features. Both studies revealed cytological grading into high and low; based on nuclear diameter, nuclear pleomorphism, and the presence of nucleoli had a close correlation with histological grade. The present study also shows a strong correlation of grading on cytology with histology grade when nuclear morphology was accounted to grade tumors.. Discriminate analysis in this study showed that the features which have closest correlation with the histopathological grade are cell uniformity, nuclear size, nucleoli, nuclear margin and chromatin pattern played an important role to grade breast lesions. This has a highly significant p-value.

In 1994, Robinson., *et al.* [7] proposed a grading system based on cytomorphology including a wider range of features including architecture arrangement, cellular details as well as nuclear characteristics. In the current context the Leishman Giemsa stained smears were examined with some additional features which were found equally reliable.

Other parameters we relied upon were loose discohesive clusters, number of bare nuclei of epithelial cells and presence of bipolar myoepithelial cells in stream. Absence or rare presence of epithelial cells and myoepithelial cells was graded higher. Yu., *et al.* in 1998 evaluated tumour cells clusters cohesion as a prognostic factor in breast aspirates and assigned a "discohesion score" (DS) [8]. The bases were the relative proportion of intact tumour cells and loosely cohesive tissue fragments in the aspirate smears. In addition to discohesion, they also calculated nuclear grade.

Various benign lesions could be easily diagnosed at FNAC; however, few have cytological features overlapped with malignant lesions. Taniguchi., *et al.* established a semi quantitative score system composed of seven parameters with introduction of necrosis as a feature to be assessed on cytosmears. In this study we have rejected such smears unless we identified clusters and cytomorphology corresponding to malignancy.

Though the FNAC based grading system has its advantages and evolved to stay in India and third world countries that would remain the choice for the diagnosis and grading of breast tumours.

The histopathological grading will continue to be the Gold standard in the final diagnosis of breast tumours in particular. The current study kept the key prognostic pathological factors while grading FNA smears are, tumour size, lymph node status, and nuclear grade.

Conclusion

Nuclear cytomorphological features are important prognostic markers and have been considered by all the studies for breast carcinoma grading. The FNA smear has proved to be costeffective, predictive, sensitive and to predict biological behaviour of breast carcinoma. It is found that cytological tumour grade is quick, easy to perform, and correlates well with tissue nuclear grade. FNAC score can be used as a tool in continuous monitoring of therapy effect during treatment. Cytomorphological grade can provide information about intrinsic features of the tumour as well as its prognosis. Considerable limitation of FNA is to differentiate between intraductal and invasive carcinoma, which will require careful.

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