IMPROVED ACCURACY RATES OF FNAC INTERPRETATION IN BENIGN BREAST LESIONS

Lt Col GU DESHPANDE ^{*}, Dr SUNITA SURI ⁺,
Dr JASKAMAL [#], Col RAMJI RAI ^{**}

ABSTRACT

We carried out a retrospective study of 194 biopsy proved benign breast lesions comparing the fine needle aspiration cytology (FNAC) diagnosis offered earlier. We reviewed the cytology smears based on recently advocated criteria and offered our fresh diagnosis. It was observed that we still overdiagnosed five cases of fibroadenomas and underdiagnosed four cases of fibrocystic change. However the quantum of such discrepancies decreased considerably than seen earlier. We could correctly diagnose two tubular adenomas and two intraductal papillomas. We also reduced the number of nonspecific diagnosis of benign breast disease from 24 to 08. Hence we could register an overall improvement of accuracy rate to 84.5% as compared to 58.8% achieved earlier.

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KEY WORDS: Benign breast disease; Biopsy; FNAC.

Introduction

Fine needle aspiration cytology (FNAC) has become a first diagnostic investigation for any palpable breast lump in modern era. The overall accuracy is quite high and differentiation between benign and malignant lesions is possible in most of the cases. However while offering a diagnosis of benign breast disease, subclassification of benign breast lesion is not correctly arrived at and many times a group diagnosis of "benign breast disease" is usually offered. Recently Maygarden et al have advocated well defined cytological characteristics for subclassification of benign breast diseases [1]. A retrospective study was undertaken at our institute and initial FNAC diagnoses and biopsy diagnoses were compared with fresh FNAC diagnoses arrived at by applying these criteria. An analysis was then carried out to find out improvement in accuracy rates in fresh FNAC diagnoses of these benign breast diseases.

Material and Method

The biopsy and Fine needle aspiration cytology (FNAC) records of Armed Forces Medical College, Pune from the period of 01 January 90 to 30 June 97 were searched to identify the aspirations carried out for breast masses. It was observed that 1220 breast masses were aspirated during this period. The biopsy reports were then searched to identify all cases for which a corresponding biopsy was available. We came across 194 such biopsies which formed the basis of this study. A benign histologic diagnosis included fibroadenoma, fibrocystic change, chronic nonspecific mastitis and other benign breast diseases. FNA smears of these cases were reviewed as a blind study without knowing the FNA or

biopsy diagnosis of these cases. The semiquantitative scoring system of Maygarden et al [1] was used for a number of cytologic characteristics. The characteristics which were tabulated were overall cellularity, nature of background of smears, amount of bipolar nuclei, amount and type of architectural arrangements of epithelial cells, epithelial atypia, apocrine metaplasia, foam cells, fat, stroma and stromal cellularity and inflammatory cells. A score ranging from 0 to 3+ was assigned to each characteristic. A score of 0 indicated that the characteristic was absent and 1+, 2+ and 3+ indicated the presence of scant, moderate or marked amount of that characteristic respectively. The fresh FNAC diagnosis was then arrived at by analysing these characteristics for each lesion as proposed by Maygarden et al.

Results

It was observed on analysis of biopsy reports (Table 1) that the incidence of fibrocystic change was highest (83/194), followed by fibroadenoma (72/194) and in 39 cases other diagnoses were offered. The analysis of initial FNA diagnosis (Table 1) as available in records showed that diagnosis of fibroadenoma was offered in 88 cases, fibrocystic change in 64 cases. In 24 cases no definite subclassification could be carried out and a group diagnosis of "benign breast disease" was offered. The analysis of FNA diagnoses which were offered on review of the old slides (Table 1) showed that diagnosis of fibroadenoma was made in 77 cases and 79 cases were diagnosed as fibrocystic change. In only eight cases a definite diagnosis could not be offered and group diagnosis of 'benign breast disease' was suggested.

Analysis of individual lesions (Table 2) showed that fibroadenoma was overdiagnosed (+16) in original as well as review diagnoses (+5); where as fibrocystic change was underdiagnosed originally (-19), as well as (-4) on review.

We could correctly diagnose two cases of intraductal papilloma and tubular adenomas. What was more important was the fact that we could minimise the group diagnosis of benign disease from 24 (12.4%) cases to only eight (4.1%) cases.

^{*} Reader, ⁺ Post Graduate Student, [#] Civilian Medical Officer, ^{**} Professor and HOD, Department of Pathology, Armed Forces Medical College, Pune 411 040.

TABLE 1
Comparison of biopsy with initial and review FNAC diagnoses (194)

	Biopsy	Initial FNAC	Review FNAC
Fibroadenoma	72	88	77
Fibrocystic change	83	64	79
Chronic nonspecific mastitis	10	5	7
Fat necrosis	6	3	5
Granulomatous mastitis	5	5	5
Duct ectasia	8	5	9
Microglandular adenosis	1	—	—
Blunt duct adenosis	2	—	—
Tubular adenoma	2	—	2
Fibroadenomatosi	3	—	—
Intraductal papilloma	2	—	2
Benign breast disease	—	24	8

TABLE 2
Number of cases over (+) or underdiagnosed (-) on FNAC

	Initial	Review
Fibroadenoma	+ 16	+ 5
Fibrocystic change	- 19	- 6
Chronic nonspecific mastitis	- 19	- 6
Fat necrosis	- 3	- 1
Granulomatous mastitis	0	0
Duct ectasia	- 3	+ 1
Microglandular adenosis	- 1	- 1
Blunt duct adenosis	- 2	- 2
Tubular adenoma	- 2	0
Fibroadenomatosi	- 3	- 3
Intraductal papilloma	- 2	0
Benign breast disease	- 24	- 8
Total	80	30

To find out the accuracy rates, the comparison of biopsy diagnoses was carried out with original and fresh FNAC diagnoses. It was observed that the overall accuracy rate which was 58.8% (114/194) in original FNAC reports, improved to 84.5% (160/194) on applying the characteristics [1].

Fig 1 to 4 reflect microphotographs of fibroadenoma (Fig 1), fibrocystic change (Fig 2), tubular adenoma (Fig 3) and intraductal papilloma (Fig 4), showing the typical diagnostic cytology features as advocated by Maygarden et al [1].

Discussion

Although distinguishing malignant breast lesion from benign breast lesion is the most important aim of FNA, after identifying the benign lesion a better diagnosis other than benign breast disease should be aimed at. Nearly 60 to 70% cases are correctly subclassified but around 30 to 40% are either misdiagnosed as some other benign breast disease or a group diagnosis of benign breast disease is offered [2]. We reviewed our archival material of FNA slides of benign breast lesions of a period of 7 1/2 years to find out the efficacy

Fig. 1 : FNA features of fibroadenoma

Fig. 2 : FNA features of fibrocystic change

Fig. 3 : FNA features of tubular adenoma

of the characteristics advocated by Maygarden et al [1]. In our institute the authors whose textbooks are usually referred to study FNA smears are Orell et al [3], Slone et al [4], Ravetto and Bocatto [5] and few research articles [6,7]. However the accuracy rate was 58.8% only. Maygarden et al [1] have advocated that

Fig. 4 : FNA features of intraductal papilloma

to separate fibroadenoma from fibrocystic disease presence of relatively large amount of stroma, branched epithelium, large honeycombed sheets, marked cellularity, abundant naked nuclei and relatively scant amount of apocrine metaplasia and foam cells along with presence of abundant small epithelial cell groups and individual nonstripped epithelial cells are most important characteristics. After applying these criteria we could offer the diagnosis of fibroadenoma in 77 cases out of which 72 were proved to be so on biopsy study. The features which favour diagnosis of fibrocystic change as advocated by Maygarden et al are overall low cellularity, low number of naked nuclei along with absence of branched epithelium and large honeycombed sheets and minimal stroma but presence of large number of foam cells and apocrine cells. With these criteria we could offer a diagnosis of fibrocystic change in 79 cases. Two cases of blunt duct adenosis and one case of microglandular adenosis and three cases of fibroadenomatosis could not be diagnosed properly. By applying the characteristics of high cellularity, marked number of naked nuclei along with round grape like clusters of epithelial cells, we could correctly diagnose two cases of tubular ade-

noma. Out of three cases of chronic nonspecific mastitis which we missed even after applying fresh characteristics, it was observed that the overall cellularity of epithelial cells as well as inflammatory cells was very low on FNA smears and diagnosis of benign breast disease could only be offered. The biopsy slides of these three cases showed marked fibrosis and very few inflammatory cells and hence the FNA smears were nondiagnostic of any specific breast lesion.

The overall accuracy rate which was 58.8% improved to 84.5% in this study after applying the newly advocated characteristics [1]. Maygarden et al has also given a flow chart for diagnosing benign breast lesions. A prospective study has already been started to improve the accuracy rates to subclassify the benign breast diseases on FNA smears in our institute. This will help the surgeons and other clinicians for better management of these benign breast lesions.

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