

AUDIT OF BREAST FINE NEEDLE ASPIRATION CYTOLOGY

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INTRODUCTION

Fine needle aspiration cytology is now an established procedure in the evaluation of breast lesions. In Lancaster this technique has been used diagnostically for approximately 18 months. During this time The Breast Screening Unit (BSU) has opened and impalpable lesions are being aspirated. This audit includes fine needle aspirates (FNA's) reported between January and September 1991. Those symptomatic cases in which there is also a tissue diagnosis have been analysed in detail. As the techniques for aspiration of impalpable lesions involve the use of new and initially unfamiliar equipment the BSU results are not included in the detailed analysis.

METHOD

The breast FNA's were taken either from symptomatic patients attending surgical outpatients or from ladies attending the BSU assessment clinic. The aspirates were taken by surgeons or radiologists. The aspirator prepared a wet fixed smear which was stained in the laboratory by the Papanicolaou method. The pathologist then reported the smear using the following diagnostic categories.

Inadequate/Unsatisfactory: Very few or no epithelial cells present

Inflammatory: Many inflammatory cells, with or without benign epithelial cells

Benign: Benign epithelial cells present

Equivocal: Epithelial cells present with some atypical features, probably benign but malignancy cannot be excluded

Suspicious: Epithelial cells present with features suspicious but not completely diagnostic of malignancy

Malignant: Carcinoma cells present

The FNA diagnoses have been compared with the histological diagnosis, where this is available. In those cases with a discrepancy between the two diagnoses, the FNA smears have been reviewed.

RESULTS

A total of 268 breast FNAs were received between January and September 1991. Seventy five of these were from the Breast Screening Unit (Group C) and 193 from symptomatic patients. In 89 of the symptomatic cases a biopsy or excision specimen was also received (Group A), the other 104 cases have not had histological follow-up to date (Group B). Those cases with a malignant diagnosis in

group B were mainly elderly and treated medically. The FNA diagnoses for each group are given in Table 1. Group A have further analysed according to FNA result as follows:

TABLE 1				
FNA Result	Total	Group A	Group B	Group C
Inadequate	49	11	38	28
Benign	71	22	49	16
Inflammatory	7	3	4	1
Equivocal	10	9	1	5
Suspicious	19	15	4	6
Malignant	37	29	8	19
Group A Symptomatic; tissue diagnosis available				
Group B Symptomatic; no tissue diagnosis				
Group C BSU cases				

FNA Diagnosis Inadequate

Eleven aspirates; histology showed benign breast change (fibroadenosis) (4), fat necrosis (2), sclerosed fibroadenoma (1), stromal fibrosis (1), duct ectasia (1) and lipoma (1). Most of these lesions showed little or no epithelial proliferation.

FNA Diagnosis Inflammatory

Three aspirates; histology showed mammary duct ectasia (2) and non-specific inflammation (1).

FNA Diagnosis Benign

Twenty two aspirates; histology showed benign breast change (6), fibroadenoma (5), one of the fibroadenomas also showed lobular carcinoma in situ, duct ectasia (1), fat necrosis (1) and carcinoma (8). On retrospective review of six of the latter smears (2 were unavailable), three had suspicious features, two were benign and one was regarded as inadequate.

FNA Diagnosis Equivocal

Nine aspirates; histology showed fat necrosis (1), benign breast change (1), angiosarcoma (1) and five carcinomas.

FNA Diagnosis Suspicious

Fifteen aspirates; histology showed carcinoma (13), hamartoma (1) and fibroadenoma (1). On retrospective review of the carcinoma smears, seven were again suspicious only and six were malignant, all six were however poor quality smears with drying artifact and masking by blood.

FNA Diagnosis Malignant

Twenty nine aspirates; histology confirmed the presence of carcinoma in all cases.

The 55 Group A carcinomas aspirated have been analysed according to FNA diagnosis, histological type and differentiation and the results are given in Table 2.

TABLE 2 – GROUP A CARCINOMAS BY FNA RESULT, TYPE AND DIFFERENTIATION

	Benign	Equivocal	Suspicious	Malignant	Total
Tubular	2	1	1		4
Papillary		1			1
Lobular	1	2			3
Lobular/ductal mixed	2	1	1		4
Mucoid				2	2
Medullary				1	1
Ductal NOS					
Well dif.*	1	1	3	3	8
Moderate dif.*	2		5	12	19
Poor dif.*			2	9	11

*dif. Differentiation

Statistical Analysis

The percentage of smears regarded as inadequate is given in Table 3.

TABLE 3

Inadequacy	
Group A	12.3%
Group B	36.5%
Group C	37%

There were no false positive diagnoses of definite malignancy.

Taking into account the inadequate and the benign aspirates from carcinoma, the false negative rate was 22%.

The absolute sensitivity is the proportion of malignant smears with a definite FNA diagnosis of malignancy whilst the complete sensitivity also includes the suspicious and equivocal diagnoses. The results are shown in Table 4.

TABLE 4

Statistical Analysis	Absolute Sensitivity	Complete Sensitivity	Predictive Value. Malig	Predictive Value Benign
Study				
Group A	53%	85.5%	100%	78%
Group C	42%	68%	100%	60%

Comparison of results from different surgical firms and individual pathologists are inconclusive as numbers of cases are too small, the overall impression is that there is little variation between individuals.

DISCUSSION

Breast FNA Cytology has a useful role to play in diagnosis of breast cancer. The degree of usefulness depends on the sensitivity of the technique and the predictive value of the results. The sensitivity is increased if radiological and clinical findings are also taken into account⁽¹⁾. Our predictive value for malignancy of 100% is good, a malignant result allows the surgeon to proceed to definitive treatment without frozen section. Caution should however still be exercised when there is discrepancy between FNA result and clinical findings.

Our inadequacy rate of 12.3% for Group A is in accordance with other centres (see Table 5), although their numbers also include cases with clinical diagnoses only. Group B inadequacy rate is high but in the absence of further information this cannot be assessed. An inadequacy rate of 37% in Group C is acceptable for the first nine months of breast screening due to the sampling problems. This has also affected the sensitivity values for this group.

If our sensitivity and benign predictive values for Group A are compared with those of other centres (see Table 6), it is clear that our results fall short of those from more experienced centres. Table 2 shows that well differentiated carcinomas, especially the tubular type and lobular carcinomas, pose a particular problem. A difficulty with FNA diagnosis of lobular carcinomas is acknowledged elsewhere⁽²⁾.

TABLE 5 – INADEQUACY RATES; COMPARISON WITH OTHER CENTRES

Preston(3)		11%
Nottingham(2)	20%	
Royal Marsden(1)		13%
Northampton(4)	12%	

The sensitivity of FNA cytology depends on the skill of the aspirator, the quality of the smear preparation and the skill of the pathologist. The quality of the aspirates in this study is satisfactory, no carcinomas had inadequate smears, but a few cases in the benign group appear to be due to inaccurate sampling.

TABLE 6 – STATISTICAL ANALYSIS: COMPARISON WITH OTHER CENTRES

Sensitivity	Preston (3)	Nottingham (2)	Northampton (4)	Royal Marsden(1)
Absolute	86%	84.7%	85%	69%
Complete	92.6%	91.9%	95.7%	
Predictive value				
Malignant	100%	99.3%		100%
Benign	98.3%	93%		

*excludes equivocal diagnoses, in other centres these are in the suspicious category

The skill of the reporting pathologist increases with experience and review of smears showing discrepancy between FNA and tissue diagnosis shows that this has improved over the study period. Difficulty in making a definite diagnosis of malignancy in some cases in the suspicious group was due to the poor quality of smears, drying artefact due to poor fixation and masking by blood.

Following this audit new methods of smear preparation are being evaluated, in particular the cytopspin method⁽³⁾, where the aspirate is flushed into collection fluid and the smear is made by experienced laboratory staff. Breast FNA cytology lends itself well to audit. It is unlikely that our performance within the first two years could equal that of centres with many years experience and our results are encouraging.

REFERENCES

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