

A 3 year audit of fine needle aspirates from a symptomatic breast clinic

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SUMMARY

A total of 2431 fine needle aspirates of symptomatic breast lumps was performed on 2096 patients over the last three years at the weekly head, neck and breast clinic at the Belfast City Hospital Trust. Diagnostic accuracy was achieved within the recommended standards although the "insufficient" rate was high at 31.8%. False negative and positive rates were low and the positive predictive value for malignancy was 99%. Excision biopsy for benign breast disease had decreased by almost a third during this period. Fine needle aspiration cytology is a highly accurate and cost-effective technique for the investigation of symptomatic breast lumps and results in significant savings.

INTRODUCTION

Fine needle aspiration cytology (FNAC) is now a well established investigative technique for the pre-operative diagnosis of breast lumps. It has gained wide acceptance due to its simplicity, high accuracy, tolerability and cost effectiveness. Complications following the procedure are rare. There has been a weekly FNAC service for the head, neck and breast clinic at the Belfast City Hospital since 1990. This audit covers the last three years. The aim is to assess our diagnostic accuracy and to determine if we have achieved the standards set by the National Health Service Breast Screening Programme (NHSBSP), which also apply to symptomatic cases.¹

PATIENTS AND METHODS

Since August 1990, Histo/Cytopathology Consultants and trainees have been involved in the taking and interpretation of fine needle aspirates of symptomatic breast lumps. New patients and review cases are first seen by a consultant surgeon and his team at the weekly head, neck and breast clinic. Patients are first assessed clinically and referred to the aspiration team if appropriate. Aspirates are performed freehand with a 23-gauge needle and 20ml syringe mounted on a Cameco handle. The aspirates are air-dried and stained with Speedy-Diff (Clin-tech). The slides are assessed firstly for adequacy of material, and in some cases an immediate provisional diagnosis is given to the surgeon.

Written reports on specimens are issued the next day and are grouped into five categories:

1. Insufficient or inadequate – if less than five groups of epithelium are obtained.
2. Benign – including cysts, inflammatory conditions and benign tumours.
3. Atypia - probably benign.
4. Suspicious of malignancy.
5. Unequivocally malignant.

RESULTS

Over the last three years 2096 patients were seen yielding 2431 aspirates, including bilateral and multiple lumps in some patients. Table I shows the diagnostic categories, biopsy rates and the ratio of malignant to benign surgical excisions for each year. The statistical analysis of the overall

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results is shown in Table II with suggested minimum values from the NHSBSP in parentheses. 341 patients underwent excision biopsy or definitive surgery. Correlation of the

histological diagnosis and cytological results is shown in Table III. Forty-one patients with advanced carcinoma were not operated upon and were managed conservatively.

TABLE I

<i>Year</i>	<i>1993-4</i> <i>1</i>	<i>1994-5</i> <i>2</i>	<i>1995-6</i> <i>3</i>
No. of patients aspirated	653	777	666
Total No. of aspirates	753	922	756
Category 1	235 (31.2%)	315 (34.2%)	224 (29.6%)
2	454 (60.3%)	530 (57.5%)	466 (58.9%)
3	17 (2.2%)	30 (30.2%)	15 (1.9%)
4	11 (1.4%)	15 (1.6%)	13 (1.7%)
5	36 (4.8%)	32 (3.5%)	38 (5%)
Biopsy – Malignant (M)	31	33	44
– Benign (B)	92	78	63
– Total	123	111	107
Excision Rate	16.2%	12%	14.15%
M:B Ratio	1:2.9	1:2.4	1:1.3

TABLE II

Overall results of the three year audit with suggested minimum values in parentheses

Total number of patients seen	—	2096	
Total number of aspirates performed	—	2431	
Insufficient rate	—	31.8%	(<25%)
Absolute sensitivity	—	70.5%	(>60%)
Complete sensitivity	—	90.8%	(>80%)
Full specificity	—	63.7%	(>60%)
PPV (C5 diagnosis)	—	99.1%	(>95%)
False negative rate (excluding C1)	—	3.95%	(<5%)
False positive rate	—	0.7%	(<1%)
		(0%)*	

* Malignant cytology not proven on biopsy

TABLE III

Category	No. of Aspirates (%)		No. Biopsied (%)		Biopsy Result		Histological Diagnosis		
					Benign (%)	Malignant (%)			
1	774	(31.8)	77	(9.9)	69	(89)	8	(11)	4 ILC, 3 IDC, 1 TLC
2	1450	(60)	123	(8.5)	117	(95)	6	(5)	2 IDC, X 1 – TLC, MPHY, ICC, DCIS
3	62	(2.5)	47	(76)	42	(89)	5	(11)	3 IDC (R) 2 ILC (R)
4	39	(1.6)	29	(74)	4	(14)	25	(86)	2 FCD 1FA 1 ADH
5	106	(4.4)	65	(61)	1	(0.7)	64	(98)	1 FA

IDC – Infiltrating ductal carcinoma
 ILC – Infiltrating lobular carcinoma
 TLC – Tubulo-lobular carcinoma
 MPHY – Malignant phyllodes tumour
 ICC – Intracystic carcinoma

DCIS – Ductal carcinoma in situ
 R – Recurrence
 FCD – Fibrocystic disease
 ADH – Atypical ductal hyperplasia
 FA – Fibroadenoma

FALSE NEGATIVES AND POSITIVES

There was a total of 14 false negative cases including insufficient aspirates. These were due to sampling and interpretation error in equal proportions. Importantly, 13 of the 14 cases had either suspicious mammographic findings or were clinically worrying although one was thought to be benign both radiologically and clinically. In category 3, atypical changes in five cases were thought possibly to be related to post-surgical irradiation but these proved to be recurrent tumours in subsequent biopsies.

Four cases were regarded as suspicious of malignancy (category 4). However biopsy revealed one case of atypical ductal hyperplasia while the remainder were of florid fibrocystic breast disease. One case was diagnosed as unequivocally malignant on cytology (category 5) but lumpectomy and axillary sampling showed no tumour. Review of the aspirate confirmed malignant cells and the patient was referred for adjuvant radiotherapy.

DISCUSSION

Fine needle aspiration cytology has largely superseded the use of "Trucut" needle biopsy and frozen section examination in the investigation of symptomatic breast lumps. With the use of FNAC in our centre the number of biopsies of breast disease proven to be benign has fallen

gradually from a ratio of almost three benign excisions to one malignant to near parity. Some women with symptomatic lumps however still opt for surgical intervention despite a benign cytology report. Conversely, elderly women with advanced cancers could be spared unnecessary biopsy following confirmation of the diagnosis by FNAC.

The audit shows our "insufficient" rate of 31.8% is higher than the recommended value. However, audit findings from various centres^{2,3} report an insufficient rate ranging from 20% to 46.8%. It is dependent on patient selection and the number and experience of aspirators. Ill-defined clinically benign lumps are usually acellular and are not suitable for FNAC. In some centres,⁴ cases of low cellularity which remain inadequate on re-aspiration are not reported as inadequate. Many studies⁵⁻⁷ have shown that best results are obtained in centres with a small selected group of well motivated aspirators be they pathologists or surgeons although controversy remains as to which of the two should best take the aspirate. In our opinion, where time and resources permit, the pathologist is better suited to perform the aspiration. Important information can be gleaned while needling a tumour such as its consistency, presence of grittiness and tendency to bleed which may help to correlate the cytological and clinical findings. With experience, an aspirator will

develop a "feel" for obtaining a representative sample.

Eleven percent of our insufficient cases proved to be malignant on biopsy follow-up. This compares relatively well with other reports³ but an incidence of carcinoma in insufficient samples of as high as 32% has been reported.⁸ The low specificity in our series is partly due to the high insufficient rate and partly to the low biopsy rate of benign cases. In certain centres the biopsy rate for benign cases was as high as 37%.⁴

False negative cases were due either to sampling or interpretation error. Sampling error was usually encountered with small deep seated tumours or in encysted carcinomas while the under diagnosis of low grade tumours such as infiltrating lobular, tubular, tubulolobular and Grade I infiltrating duct carcinomas is a well recognised pitfall especially in sparsely cellular aspirates.⁹ Four of 29 cases (13.7%) were regarded as suspicious of malignancy; they were subsequently proven benign on histology. Matthews *et al*¹⁰ reported 18.4% of the category 4 cases were as wrongly diagnosed. Certain benign lesions, particularly atypical hyperplasia, some florid fibrocystic disease and even fibroadenomas may have disconcerting cytological features. The positive predictive value for carcinoma however remains very high and to reduce both the false-negative and false-positive rates to a minimum a combined (triple) approach with clinical examination and radiological assessment is imperative. A "one-stop" breast clinic with facilities for immediate FNAC reporting offers the most efficient management of patients with symptomatic breast lumps and results in significant savings.

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