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COMPARISON OF FINE-NEEDLE ASPIRATION CYTOLOGY AND EXCISIONAL BIOPSY OF BREAST LESIONS

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ABSTRACT

Objectives: To evaluate the sensitivity and specificity of fine-needle aspiration cytology as compared to excisional biopsy of breast lesions of the same subjects and ascertain the usefulness of the method as diagnostic procedure.

Design: A prospective comparative study of fine-needle, aspiration, cytology and excisional biopsy of breast lesions.

Subjects: One hundred and two patients with palpable breast lesion.

Results: Fine-needle aspiration cytology as a routine method in the management of breast diseases was compared to excisional biopsy of the same patients. Sixteen patients (15.7%) had carcinoma of the breast and 86 (84.3%) cases were found to have fibroadenomas of the breast. The sensitivity was 94.3% and the specificity was 78.6%. The positive and negative predictive values were 68.8% and 96.5% respectively. There were three false positive and false negative cases.

Conclusion: The high sensitivity and specificity results, obtained ascertains that fine needle aspiration cytology is the most reliable diagnostic method. Its cheapness and respectable diagnostic value makes it indispensable for preoperative breast lesion diagnosis.

INTRODUCTION

Fine-needle aspiration cytology of mammary lesion has become a quasi-routine clinical procedure in many hospitals and clinics, replacing a pre-operative tissue biopsy. There are many notable benefits to this method of diagnosis:

- (i) Rapidity and, in experienced hands, reliability of the diagnosis of mammary carcinoma.
- (ii) The involvement of cancer patients in choice and planning of treatment.
- (iii) The ability to perform quantitation of steroid receptor binding oestrogen and progesterone, proliferation antigen (such as K167) and DNA pattern analysis on smears, thus requiring no excisional biopsy(1).

Aspiration cytology is also considered to be the method of choice in the diagnosis of cystic lesion and in distinguishing between diffuse suppurative mastitis and inflammatory carcinoma(2).

Fine-needle aspiration cytology of the breast is an inexpensive and simple office tool that can be used to establish diagnosis and plan the patients for future therapy prior to hospitalisation for treatment on out patient basis alone(3-7). The accuracy of the method is very high 95% according to previous studies(3-7). Although aspiration cytology has been used for many years in the diagnosis and management of breast lesion in Scandinavia and in North America(5), the art has been just introduced to the diagnostic service in our country. Previous studies reveal that breast carcinoma is the second leading malignant neoplasm only exceeded by cervical carcinoma in Ethiopia(8). As a result such useful diagnostic method should be encouraged in our set up.

MATERIALS AND METHODS

Patients: Patients with palpable breast lesions referred to pathology laboratory of Ethiopian Health and Nutrition Research Institute from 1st March 1999 to 1st April 2000 for fine-needle aspiration cytology were included in this study. Consent was secured after due explanation of the procedure and its benefits.

Specimen collection: Standard technique of aspiration cytology of palpable breast lesions was used. Clinical evaluation of location of breast lesions, consistency and characteristic of the aspirate were carefully documented.

The patients were advised to cooperate and were told to lie on the examination table. A 10 cc syringe and needle was fitted to a special handle which permits a one hand grip while fine-needle aspiration was performed.

The skin was wiped with antiseptic solution and suspected lesion was held with one hand in a position favourable for needle aspiration. When the needle had entered the tumour area the piston of the syringe was retracted thus creating a vacuum, with the needle in a position to be moved back and forth three or more times and directed into different areas of the tumour(3,9,11).

Throughout this manipulation, negative pressure was maintained in the syringe by keeping the piston retracted. After the needle was withdrawn, the syringe was disconnected filled with air and reconnected.

The material thus obtained was smeared, alcohol fixed and stained with May Grun Wald Giemsa Stain and the result was read by a senior pathologist. All the cases who were examined by fine-needle aspiration cytology were put to excisional biopsy of the same breast lesion in Saint Paulos Hospital Surgical Referral Clinic and the tissue samples were histopathologically examined in EHNRI Pathology Laboratory using standard Haematoxylin Eosin Stain.

The pathologist was blinded to the excisional biopsy by using a code number. The results were compared to that of fine-needle aspiration cytology. The data entered in Microcomputer using Dbase III + and analysis was conducted using SPSS PC+ and EPI-INFO.

RESULTS

Both benign and malignant neoplasms of the breast occurred in relatively high frequency in younger and productive age groups (Table 1).

Table 1

Age distribution

Age	Value	Frequency	%	Valid %	Cum %
15-30	1	65	63.7	63.7	63.7
31 -45	2	27	26.5	26.5	90.2
45+	3	10	9.8	9.8	100.0
Total		102	100.0	100.0	

Table 2

Sex distribution

Valuable	Value	Frequency	%	Valid %	Cum %
Male	1	5	4.9	4.9	4.9
Female	2	97	95.1	95.1	100.0
Total		102	100.0	100.0	

Among 102 patients included in our study, five were men (4.9%) and 97 were females (95.1%) (Table 2). The cytologic analysis of the fine-needle aspiration from the breast revealed 16 positive cases for carcinoma of the breast (15.7%) and the remaining 86 cases 84.3% were benign breast growths, predominantly fibroadenoma of the breast and fibrocystic diseases (Table 3).

Table 3

Cytologic diagnosis

Cytology	Value	Frequency	%	Valid %	Cum %
Ca	1	16	15.7	15.7	15.7
Benign	2	86	84.3	84.3	100.0
Total		102	100.0	100.0	

Table 4

Histopathologic diagnosis

Cytology	Value	Frequency	%	Valid %	Cum %
Ca	1	14	13.7	13.7	13.7
Benign	2	88	86.3	86.3	100.0
Total		102	100.0	100.0	

The comparative analysis of histopathologic diagnosis of the same patients revealed 14 positive cases for carcinoma of the breast 13.7% and 88 benign lesions (86.3%) (Table 4).

Comparative analysis of the cytologic findings and histopathologic diagnosis revealed 78.6% sensitivity, 94.3% specificity, 68.8% positive predictive value and 96.5% negative predictive value (Table 5).

Table 5

Comparative analysis of cytological and histopathologic diagnosis

Cytology	Count row Row. pct Col pct	Histopathology		Row Total
		Ca 1	Benign 2	
Ca	1	11 68.8 78.6	5 31.3 5.7	16 15.7
Benign	2	3 3.5 21.4	83 96.5 94.3	86 84.3
	Column Total	14 13.7	88 86.3	102 100.0

There were three false positive cases for carcinoma which histopathologic examination revealed as benign and three false negative cases proved to be carcinoma by histopathologic diagnosis (Table 5).

DISCUSSION

The purpose of this study was to determine the clinical value of fine-needle aspiration, its overall reliability and its place in relation of surgical biopsy. All clinicians agree on the necessity for prompt diagnosis of any breast lump surgical biopsy is more traumatic than fine needle aspiration.

The advantages of fine-needle aspiration are its speed, safety, convenience, ease of repetition and cheapness(12).

In our study the pathologist was blinded to the excisional biopsy by using code numbers in order to avoid bias.

The comparative analysis of fine-needle aspiration as compared to histopathologic diagnosis of the same breast lesions of 102 cases showed that 78.6% sensitivity, 94.3% specificity, 68.8% positive predictive value and 96.5% negative predictive value. These results are compatible with other studies with large series of 77% to 96% sensitivity and specificity(10).

The false positive and negative results obtained were due to technical error apparently caused by small non palpable lesions and in cases of macromastia can be avoided with due precautions and technical improvement.

In conclusion, aspiration cytology of the breast lesions is a safe procedure with high diagnostic accuracy. Its cheapness and high diagnostic value makes it indispensable and highly preferable for preoperative breast lesion diagnosis.

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REFERENCES

1. Leopold G. Koss: Diagnostic Cytology and its Histopathologic bases 4th edition 1992; 2:1293 - 1297.
2. Anneter, Batgab, MD, CPT, MC Kristen B. Raines, MD, MAJ, MC Yeu - Tsu Margaret Lee, MD LTC, MC E. Lawrence Saras, MD, LTC, MC and Judy M. Ribbing, CT (ASCP), Cmiac Fine-Needle Aspiration biopsy of cold thyroid Nodules. *Cancer* 1988; 62:1337 - 1342.
3. G. Riotton, W. M Christopherson. Cytology of None - gynaecological sites. International histological classification of tumours 1977; 17:57 - 58.
4. A. John Webb: The diagnostic cytology of breast carcinoma. *Brit J. Surg.* 1970; 57:259 - 2262.
5. C.M. Furnival, H.E. Hughs, M.A. Hocking, M.MW Reid and L.H. Blumgrant. Aspiration cytology in breast cancer, its relevance to diagnosis. *Lancet*, 1975; 446-448, .
6. Eazavedo, G. and Savane G. Auer. Stereotactic Fine -Needle Biopsy in 2594. Mammographically detected non palpable lesions. *Lancet* 1989; 1:1033 - 1035.
7. Zajedla A. The value of aspiration cytology in the diagnosis of breast cancer. Experience at the foundation Curie. *Cancer* 1977; 35: 499 -506.
8. Feleke Bojia, Amare Dejjane and Yared Mekonnen: Retrospective study of cervical carcinoma (1988 -1992). *Ethiop. J. Hlth Dev.* 1994; 8:119- 121.
9. C.J. Davies, C.W Elston, R.E Cotton and R.W. Blamey Preoperative Diagnosis in carcinoma of the breast. *Brit. J. Surg* 1977; 64:326 - 328, .
10. Teodori M. Gardecki, Brian Hogbin David H. Melcher, Russel S. Smith: Aspiration cytology in the preoperative management of breast cancer. *Lancet.* 1980; 790:792.
11. Franzen F. and Zajicek J. Aspiration biopsy in diagnosis of palpable lesions of the breast. Critical review of 3479 consecutive biopsies. *Acta Radiol.* 1968; 7:241-262.
12. The Diagnostic Cytology of Breast Carcinoma. By A. John Webb paper presented to Royal Society of Surgery, at Bristol 1969.
13. A.P.M. Forrest, J.R. Kirpatrik, M. Maureen Roberts: Needle aspiration of breast cysts. *Brit. Med. J.* 1975; 3:31 -32.
14. Russ J.E., Winchester D.P. and Scanlon E.F. *et al*: Findings of aspiration of tumours of the breast. *Surg. Gynec. Obstet.* 1978; 146:407- 411.

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