

# Repeated Fine Needle Aspirations in the Diagnosis of Soft Tissue Metastases in Breast Cancer

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**Abstract**—In 36 patients, treated for breast cancer and with a suspected metastasis in the subcutis, the diagnostic efficacy of repeated fine needle aspiration (FNA) has been evaluated in 39 tumours. By increasing FNA from one to three, the diagnostic sensitivity was increased from 0.59 (95% C.L. 0.33–0.82) to 0.83 (95% C.L. 0.52–0.98). Diagnostic specificity for one aspiration was 0.95 (0.77–1.00), and for two and three aspirates it was 0.96 (0.80–1.00) if suspicious aspirates were considered as positive, and 1.00 for one, two and three aspirations when only aspirates with tumour cells were considered positive. Statistically, three aspirates were significantly better than one in establishing the diagnosis of a soft tissue tumour in patients with breast cancer.

## INTRODUCTION

RECENTLY, we performed a study to compare the efficacy of fine needle aspiration (FNA) and Tru-Cut biopsy (TCB) [1, 2]. We found that FNA was significantly better than TCB and that the diagnostic specificity for FNA was 1.00, implying that FNA, when positive, is a sufficient diagnostic procedure. However, the diagnostic sensitivity was 0.65, which implies a substantial risk of false negativity. We have therefore performed another study with repeated FNAs in order to improve the diagnostic sensitivity of FNA.

## MATERIALS AND METHODS

Patients with a primary diagnosis of breast cancer and with a suspected metastasis in the subcutis of more than 0.5 cm in size were included in the study. The tumour was evaluated clinically as benign, suspicious or malignant, and FNA was performed three times as described in the first study [1], only without local analgesia. Needles were changed between each perforation, while the syringe was the same. Specimens were examined by the same pathologist, and classified in the same way as in the first study [1]. If specimens were suspicious, negative or unsatisfactory for evaluation, the patients were referred to the surgical ward for a surgical

Table 1. Characteristics of aspirated tumours (n = 39)

Tumour diameter (mm)	
Median	10
Range	6–60
Location of tumour (biopsy)	
Local	15
Ipsilateral axilla	12
Contralateral axilla	1
Contralateral breast	1
Elsewhere	10
Prior radiotherapy in the tumour region	13
Benign tumours	(6)
Malignant tumours	(7)

biopsy. The statistical definitions and methods used are described in the first study [1].

## RESULTS

Thirty-six patients with 39 sets of specimens were included in the study. Tumour characteristics are presented in Table 1. Results of clinical examinations and FNA × 1–3 are shown in Table 2. Most of the false negative aspirates (including aspirates unsatisfactory for evaluation, but with positive surgical biopsy) were taken from tumours located in the axillae (71% for one FNA, and 100% for both two and three FNAs). Median tumour diameter from the false negative FNAs did not differ from the median tumour diameter in general (10 mm). The false suspicious aspirate originated from a tumour above the angulus mandibulae (biopsy: pleo-

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Table 2.

	Clinical diagnosis		FNA 1		FNA 1 + 2		FNA 1 + 2 + 3	
	n	(%)	n	(%)	n	(%)	n	(%)
Positive (malignant)	18	(46)	19	(49)	22	(56)	25	(64)
Suspicious	18	(46)	3	(8)	3	(8)	2	(5)
Negative (benign)	3	(8)	11	(28)	9	(23)	9	(23)
Unsatisfactory for evaluation			6	(15)	5	(13)	3	(8)
False malignant	1	(3)	—					
False suspicious	8	(21)	1	(3)	1	(3)	1	(3)
False negative	1	(3)	5	(13)	3	(8)	2	(5)
Positive biopsy and unsatisfactory aspirate			2	(5)	1	(3)	0	

FNA = fine needle aspiration. When FNA was suspicious or negative, surgical biopsy served as the key diagnosis, while a positive FNA served as its own key diagnosis, since no false positive FNA was found in the first study [1].

Table 3. Diagnostic probabilities and accuracy

	Diagnostic specificity	Diagnostic sensitivity	Diagnostic accuracy
Clinical diagnosis	0.75 (0.58–0.88)	0.66 (0.09–0.99)	0.74 (0.58–0.87)
FNA × 1	0.95 (0.77–1.00)	0.59 (0.33–0.82)	0.79 (0.64–0.91)
FNA × 1 + 2	0.96 (0.80–1.00)	0.71 (0.42–0.92)	0.87 (0.72–0.96)
FNA × 1 + 2 + 3	0.96 (0.81–1.00)	0.83 (0.52–0.98)	0.92 (0.79–0.98)

FNA = fine needle aspiration. 95% confidence limits are given in parentheses. Suspicious aspirates are included in positive tests.

morphic salivary adenoma, no sign of malignancy). Diagnostic probabilities can be seen in Table 3. It must be noted that by performing FNA three times instead of once, the diagnostic sensitivity is increased from 0.59 to 0.83, and correspondingly the diagnostic accuracy is increased from 0.79 to 0.92. The diagnostic specificity, which in the first study was 1.00, has been decreased to 0.95 for FNA × 1, and to 0.96 for FNA × 2 and 3. In Table 3, suspicious tests are included in the positive test results. However, if only aspirates with tumour cells are included in positive tests, the diagnostic specificity is still 1.00 for FNA × 1, × 2 and × 3. Comparing FNA × 1 with FNA × 3 directly, we find a total diagnostic gain of 18% (5–31). With 7 preferences for FNA × 3, the McNemar test (with Yates' correction) shows significance on the 5%

level ( $X^2 = 5.14$ ). Comparing FNA × 1 with FNA × 2, a non-significant trend for FNA × 2 is found ( $X^2 = 2.25$ ).

## DISCUSSION

We have succeeded in increasing significantly the diagnostic sensitivity from 0.59 with FNA × 1 to 0.83 with FNA × 3, and as FNA only implies little discomfort for the patients, we recommend that FNA should always be performed three times from a tumour which is suspicious for recurrence of breast cancer. Most of the false negative aspirates in our study were from the axillae, and special caution is therefore needed when performing FNA from a tumour in the axilla. In case of a negative outcome of FNA or content of suspicious cells, a surgical biopsy must be performed.

## REFERENCES

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