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Original article

Replace fine needle aspiration cytology with automated core biopsy in the triple assessment of breast cancer

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All patients presenting with a symptomatic breast lump are assessed by means of triple assessment (clinical examination, radiology in the form of mammography and cytology by means of a fine needle aspiration) performed by the clinician in the rapid access breast clinic at the Royal Gwent Hospital, Newport, UK. In our initial experience, it was found that a significant number of patients were returning to clinic for the results of the triple assessment to find that the cytology was not conclusive and hence needed a core biopsy, thus delaying diagnosis and definitive treatment.

Therefore, a prospective study was carried out over a 6-month period, where all patients presenting with a symptomatic lump with a clinical or radiological suspicion of breast cancer had, in addition to the standard triple assessment, an automated core biopsy, thus giving rise to the quadruple assessment of the breast lump.

A total of 52 patients with a clinical or radiological suspicion of breast cancer were included over this 6-month period. Of these 52 patients, 31 had a definitive diagnosis of breast cancer on fine needle aspiration (sensitivity 60%) compared with 50 of the 52 patients on core biopsy (sensitivity 96%). When radiology was diagnostic of breast cancer (R 5), the sensitivity of cytology was 61% compared with 97% with core biopsy. However, when radiology was not diagnostic of cancer (R 1–4), the sensitivity of cytology fell to 53% while the sensitivity of core biopsy remained high at 95%. The overall cellularity rate for cytology was 96%, which exceeds the BASO requirement for fine needle aspiration cytology.

From these results, we conclude that automated core biopsy has a superior diagnostic power when compared with fine needle aspiration cytology and hence should replace fine needle aspiration cytology in the assessment of symptomatic breast lumps.

Key words: Breast cancer – Fine needle aspiration cytology (FNAC) – Automated core biopsy

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The aim in the modern management of breast cancer is to make a rapid pre-operative diagnosis to allow the planning of a therapeutic operation with the patient. The triple assessment – which comprises clinical examination, mammography and cytology – is used to make a pre-operative diagnosis. Fine needle aspiration cytology (FNAC) is the principal mode of diagnosis in most specialist centres,[1,2] with core biopsy being used when FNAC has failed to provide a pre-operative diagnosis of breast cancer. Studies have shown that fine needle aspiration cytology can be inconclusive in up to 30% of patients, 20% being reported as inadequate and a further 10% being suspicious, but not diagnostic of malignancy.[3] These patients then need a core biopsy or open biopsy, thus delaying their pre-operative diagnosis.

A rapid access breast clinic was set up in the Royal Gwent Hospital, Newport, UK in 1995. All patients with a breast lump were subjected to the triple assessment. It was our experience that a significant number of patients were being seen in the follow-up clinic with inconclusive cytology results, thus necessitating a core biopsy at their follow-up visit and delaying the definitive management.

Patients and Methods

A prospective study was carried out at this hospital between December 1996 and May 1997, where all patients presenting to the rapid access breast clinic with a clinical or radiological suspicion of breast cancer underwent FNAC and core biopsy, thus giving rise to the quadruple assessment.

FNAC was performed using a 21 G needle and a 10 ml syringe. At least 4 slides were prepared, half air-dried and half fixed in acid-alcohol. For core biopsy, the skin was infiltrated with 1% lignocaine and a small stab incision was made using a scalpel. Cores of tissue were obtained using an automated spring loaded device – Promag 2.2 – manufactured by Manan Medical Products, using a 16 G needle. The tissue was fixed in formalin.

Results

During the study period, 52 patients with palpable breast lumps that were clinically or radiologically suspicious of breast cancer were evaluated using FNAC and core biopsy. Of the 52 patients, 31 had a definitive diagnosis of breast cancer made by FNAC compared to 50 of the 52 patients by core biopsy. The standard scoring system was used and the results of the quadruple assessment are given in Table 1. The sensitivity of FNAC was 60% compared with 96% for core biopsy. The results were further analysed to determine the sensitivity of cytology and core biopsy in relation to the radiology scores and these figures are given in Table 2. Two patients did not have mammography as they were too frail and, following clinical examination, proceeded to FNAC and core biopsy. When radiology was diagnostic of cancer (R 5), the sensitivity of cytology was 61% compared with 97% with the core biopsy. When radiology was not diagnostic of cancer (R 1–4), the sensitivity of cytology fell to 53% compared with 95% with the core biopsy. Only 19 of the patients (37%) had both malignant radiology and cytology, and could be treated on the basis of the triple assessment compared with 50 (96%) where core biopsy was used.

Table 1 Diagnostic scores of quadruple assessment

Score	Clinical	Radiology	Cytology	Histology
1		1	2	
2	4	1		1
3	1	4	1	
4	4	13	18	1
5	43	31	31	50
Total	52	50	52	52

Table 2 Radiology by final diagnosis

	R 5 (n = 31)		R 1–4 (n = 19)	
	Malignant	Sensitivity	Malignant	Sensitivity
Cytology	19	61%	10	53%
Core biopsy	30	97%	18	95%

The breakdown of the cytology results by grade of aspirator is given in Table 3. The overall cellularity rate for cytology was 96%, which exceeds the BASO requirement for FNAC and there was no difference in the diagnostic rate of fine needle aspirations performed by the consultant and registrar.

Discussion

There has been some controversy as to which of the needle biopsies is more valuable in the pre-operative diagnosis of breast cancer. Most breast centres seem to prefer fine needle aspiration cytology as the initial diagnostic procedure, with automated core biopsies reserved for patients where cytology has failed to give a definitive diagnosis.[4] However, this may involve a delay in diagnosis, with the associated psychological trauma.

Table 3 Cytology by aspirator

Score	Consultant	Registrar	SHO
1	1 (4.8%)		1 (17%)
2			
3		1 (7.2%)	
4	9 (30.6%)	5 (29%)	4 (66.4%)
5	19 (64.6%)	11 (63.8%)	1 (16.6%)

SHO = senior house officer

Various reasons have been attributed for a low sensitivity for FNAC including proficiency of the aspirator,[2] experience of the pathologist, size of the lesion and histological type of the tumour.[5–7] A study in Nottingham using a combination of cytology and automated core biopsy in the diagnosis of breast cancer showed an absolute sensitivity of 80% for cytology and 88% for core biopsy, while a combination of the two biopsies resulted in a sensitivity approaching 100%.[8] Our low sensitivity rate on cytology of 60% is not due to a deficiency in the aspirator's technique, as the results of cytology showed a cellularity rate of 96% (Table 3), which exceeds the BASO requirements for FNAC.[9] Fine needle aspiration cytology, like all surgical procedures, has a learning curve, and a cellularity of 96% shows the proficiency of the surgeons undertaking the procedure.

Of the two patients who had non-diagnostic core biopsies, one had a clinical, radiological and cytological score of 5 and hence proceeded to definitive treatment without delay. The second patient had a clinical score of 3, radiology score of 4, cytology score of 4 and a core biopsy score of 2 and so went on to have an open biopsy, which showed an invasive lobular carcinoma. Lobular carcinomas have been reported to be difficult to diagnose on fine needle aspiration, though this should have been diagnosed on core biopsy.[10]

In conclusion, we have shown that automated core biopsy has a superior diagnostic power when compared with FNAC in the diagnosis of breast cancer especially when radiology is not diagnostic. Automated core biopsy should replace or complement fine needle aspiration in the pre-operative assessment of suspicious breast lumps.

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