Minimal Breast Lesions - Non-operative diagnosis. *Dr Daniel Faverly*

With the contribution of the European Community Working Group on Breast Screening Pathology

Introduction

The decision about whether to operate on patients with screen-detected mammographic abnormalities involves the correlation of clinical and radiological data and findings from needle aspiration cytology (FNAC) and/or needle core biopsy (NCB). This is best achieved in multidisciplinary meetings where the clinician, radiologist and pathologist (triple assessment) discuss these findings and reach a consensus on the appropriate management of each patient following pre-defined protocols.

Until recently, needle aspiration was the more widely used technique but core biopsy is being used increasingly. There has been much discussion about the relative merits and disadvantages of the two methods.

Core biopsy has several advantages. It is possible to distinguish in situ from invasive carcinomas although, not surprisingly, the technique has greater positive than negative predictive value as the invasive component of a tumor may not always be included in the biopsy. It is easier to diagnose carcinomas with low grade cytological features which are difficult to recognise without architectural interpretation. Specific benign diagnoses can be made and this allows better correlation of clinical, radiological and histological features. Another major advantage is that needle biopsies can be subjected to specimen radiography to ensure that the mammographic abnormality has been sampled. If the relevant calcification is included in the biopsy and is clearly associated with a benign process then an unnecessary operation is avoided.

On the other hand, fine needle aspiration is quicker to perform, does not require local anaesthetic and consequently uses less clinic time. Multiple passes with a needle can increase diagnostic accuracy with both techniques (FNAC and NCB) but is easier to perform with FNAC. Small and impalpable lesions are also generally easier to localise, particularly if imaging is used but localisation of lesions with NCB has improved significantly in recent years. As FNAC is a quicker technique cytopathologists can provide diagnoses in clinics so that triple assessment can be completed in a single visit.

Most pathologists, however, find if easier to interpret NCB and consequently the standards of diagnosis are generally higher except where FNAC is performed in major cytopathology centres.
It is clear that FNAC and NCB are complementary techniques in arriving at a non-operative diagnosis. The efficacy of both methods, however, is heavily dependent on the skill and experience of the operator who is rarely a pathologist, particularly in the case of needle core biopsy.

Reporting FNAC

From "European Guidelines for Quality Assurance in Mammography Screening" Third Edition, January2001.

The results of FNAC are reported according to five categories:

C1 Inadequate

Indicates a scanty or acellular specimen or poor preparation. The designation of an aspirate as "inadequate" is to a certain extent a subjective matter and may depend on the experience of the aspirator and/or the interpreter. Poor cellularity (usually less than five clumps of epithelial cells) is sufficient to declare an aspirate inadequate. Preparative artefacts or excessive blood may also be reasons for rejecting an aspirate as inadequate.

Preparative artefacts include:

1. Crush, when too much pressure is used during smearing.
2. Drying, when dry smears are allowed to dry too slowly or when wet-fixed smears have been allowed to dry out before fixation.
3. Tick smears, when an overlay of blood, protein-rich fluid or cells obscurs the picture, making assessment impossible.

C2 Benign

Indicates an adequate sample showing no evidence of malignancy. The aspirate in this situation is often poorly to moderately cellular and tends to consist mainly of regular duct epithelial cells. These are generally arranged in monolayers and have the characteristics benign cytological features with round, oval, regular, small nuclei. Should cystic structures be a component of the aspirated breast, then a mixture of foamy macrophages with or without regular apocrine cells may be part of the picture. Fragments of fibrofatty and/or fatty tissue are common findings. A positive diagnosis of specific conditions (fibroadenoma, lymph node,…) may be suggested if sufficient features are present to establish the diagnosis with confidence.

C3 Atypia probably benign

All the characteristics of a benign aspirate may be seen as described above. In addition, there are certain features not commonly seen in benign aspirates, including any of the following, alone or in combination:

1. Nuclear pleomorphism
2. Some loss of cellular cohesion
3. Nuclear and cytoplasmic changes resulting from, for example, hormonal influence or treatment effects.

Increased cellularity may accompany the above features. As thus defined, this group would be expected to contain approximately 20% of cases which were subsequently proven to be malignant.

C4 Suspicious of malignancy

The pathologist's opinion is that the material is suggestive but not diagnostic of malignancy. There are three main reasons:

1. The specimen is scanty, poorly preserved or poorly prepared, but some cells with features of malignancy are present.
2. The sample may show some malignant features without overt malignant cells present. The degree of abnormality should be more severe than in the previous C3 category.
3. The sample has an overall benign pattern but with occasional cells showing distinct malignant features.

As thus defined, this group would expected to contain approximately 80% of cases which were subsequently proven to be malignant.

C5 Malignant

Indicates an adequate sample containing cells characteristic of carcinoma or other malignancy. The interpreter should feel ease in making such a diagnosis. Malignancy should not be diagnosis on the basis of a single criterion but on a combination of features.

Calcification

It is very useful for the radiologist if the pathologist reports the presence of calcification within FNAC specimens when the abnormality is one of mammographic microcalcification. If calcification is present in theses circumstances, the radiologist or multidisciplinary team can be more certain that the lesion has been sampled accurately and that the likelihood of false negative due to an aspiration miss is lower. This may allow the team to advise with greater confidence that the women be routinely recalled or rescreened early rather than subjected to biopsy. It is desirable to specify the type of calcification.

Calcification alone does not discriminate between benign and malignant conditions.

Reporting Needle Core Biopsy

From "European Guidelines for Quality Assurance in Mammography Screening" Third Edition, January2001.

For the purposes of data recording and quality assurance in breast screening programmes, it is recommended that needle core biopsies are classified on a 5 point scale in a similar fashion to cytological specimens. Some teams may wish to merge categories B3 and B4 as both indicate the need for further action.

It needs to be emphasised, however, that the categories are not the same as the five cytology categories and have different clinical inferences. It is essential that the histological appearances in NCB are

compared with clinical and radiological findings in order to ensure that the biopsy is representative.

B1 Uninterpretable or Normal

This may indicate an unsatisfactory biopsy which is uninterpretable because of artefact or composed of stroma only. Biopsies containing normal breast tissue in case where normal appearances are felt to be inconsistent with findings on imaging and clinical examination should be classified in this category.

B2 Benign lesion or Normal

Indicates that the sample contains a benign abnormality. Biopsies exhibiting normal appearances may be included in this category if they are felt to be consistent with the findings on imaging and clinical examination. Involutionary calcification should be classified as benign.

B3 Lesion of uncertain malignant potential

This category mainly consists of lesions which may provide benign histology on core biopsy but are known to show heterogeneity or to have an increased risk (albeit low) of associated malignancy. Examples of such lesions include atypical ductal hyperplasia, lobular neoplasia, phyllodes tumor, papillary lesions and radial scar/complex sclerosing lesion,…

B4 Suspicious

Indicates that the changes suggestive of in situ or invasive malignancy are present but a categorical diagnosis cannot be made because of artefact or because the appearances are borderline.

B5 Malignant

Indicates the presence of an unequivocal malignant process usually in situ or invasive carcinoma.
Categories a) indicates that in situ carcinoma only is present.

b) indicates that invasive carcinoma is seen

c) indicates that it is not certain whether the carcinoma is invasive or not.

Calcification

Should a needle core biopsy be performed for investigation of suspicious microcalcification, the report should clearly indicate whether microcalcification has been identified in the biopsy and whether it is associated with a specific abnormality. Radiography of the specimen can assist in identification of microcalcification and confirm that its characteristics are the same as those of the mammographic abnormality.

Quality assurance

In assessing performance it is essential to specify whether the performance indicators (e.g. sensitivity, specificity, positive predictive value) related to the histological report alone or to the diagnosis reached after consideration of pathological, radiological and clinical findings.

References

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