ORIGINAL ARTICLE

Prebiopsy Localization of Nonpalpable Breast Lesions

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Summary

Radiologically guided localization procedures are indicated pre-operatively when breast lesions are nonpalpable. The results of 42 percutaneous hookwire localizations over a period of 3 years are described. Of the total, 7 (17%) were found to be malignant. Biopsy was indicated by mammographically detected mass in 48%, by microcalcifications in 40% and by microcalcifications with an associated mass in 12%.

Key words: Breast biopsy, breast neoplasms, breast radiography.

Introduction

When a nonpalpable suspicious lesion is detected on mammography, radiologically guided localization is required before biopsy. Prebiopsy localization assures accurate removal of a small specimen and therefore causes minimal disfigurement.

The mammographic services at the General Hospital, Kuala Lumpur, were started about 3 years ago and until June 1992, 1,667 mammograms and 42 localizations have been performed. The purpose of this report is to document the findings of this series of percutaneous hookwire localizations and to determine the positive biopsy rate of mammographically detected nonpalpable breast lesions at our centre.

Materials and Methods

Between October 1989 and June 1992, 42 hookwire localizations were performed on 39 patients aged between 29 and 63 years. Two patients had bilateral procedures and 1 patient had the procedure twice.

In the initial stage, various localization methods were used. The current practice is to make the hookwire by bending one end of a 0.029" stainless steel wire (normally used for orthodontic work) (Fig 1a). The hookwire is then introduced into a 19G spinal needle via the needle tip. The wire cannot be introduced via the needle hub as the dimension of the bent end of the hookwire is bigger than the calibre of the needle. The bent end of the hookwire is positioned just at the bevelled tip of the needle (Fig 1b). Compared with commercially available hookwires, this improvised hookwire-needle combination made from readily available components is cheap.

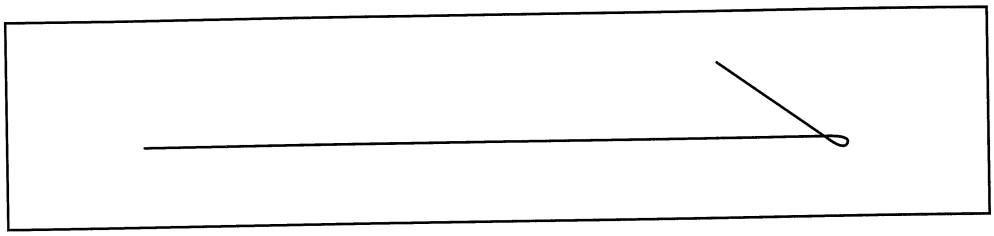

Fig 1a: Diagram shows the shape of the bent end of the hookwire

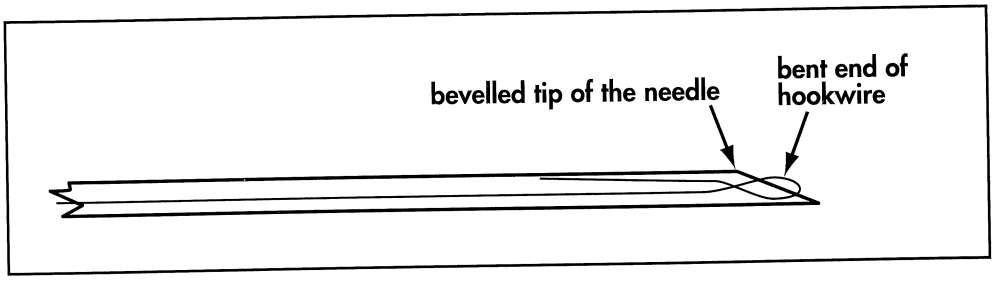

Fig 1b: Diagram shows portion of the bent end of the hookwire within the needle.

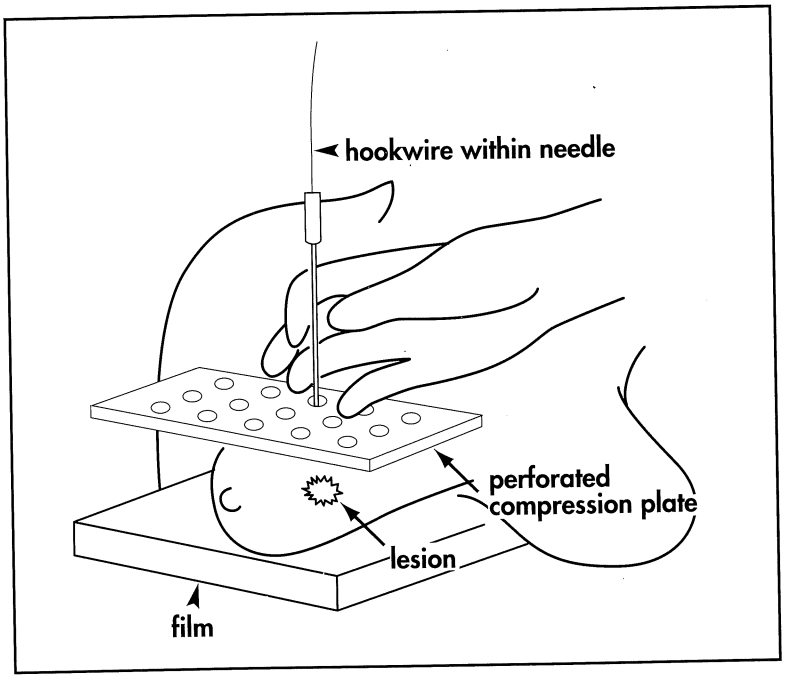

Fig 2a: Method of localization.

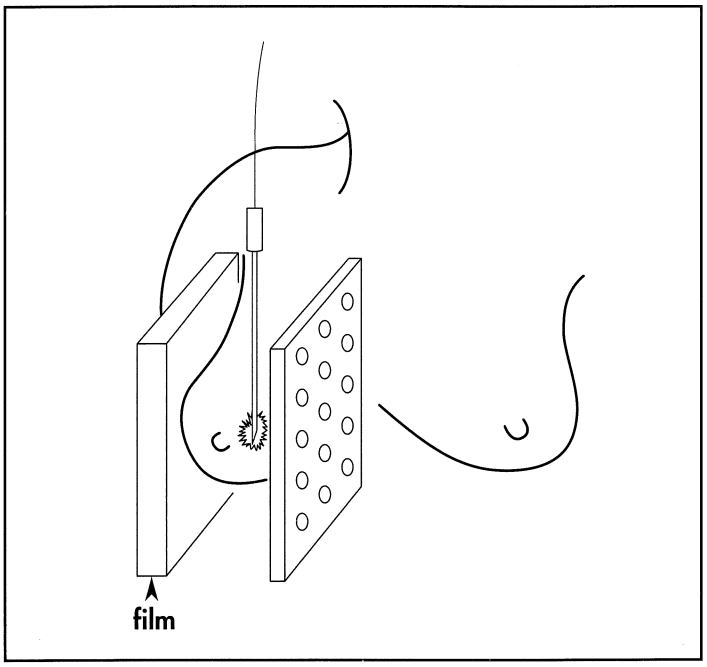

Fig 2b: Method of localization.

A perforated compression plate is used for guidance. The needle with the hookwire within its lumen is introduced in one view (Fig 2a) and its position adjusted in a second view (Fig 2b) before the needle is withdrawn, leaving the hookwire *in situ* (Fig 2c). This procedure is performed under local anaesthesia. After taping the wire to the skin, the patient is transferred to the operating theatre.

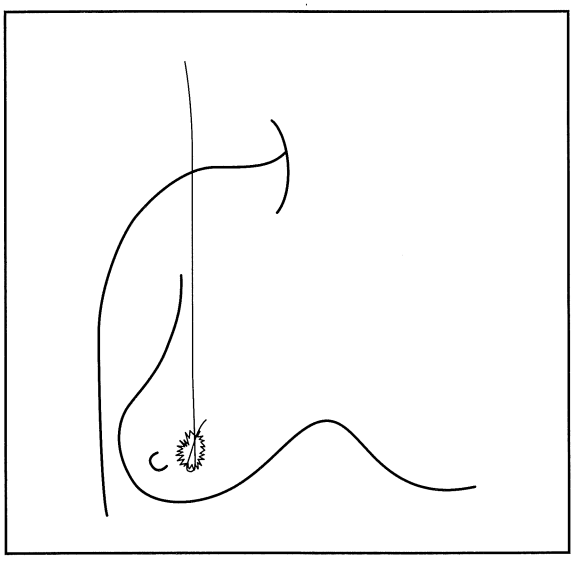

Fig 2c: Method of localization.

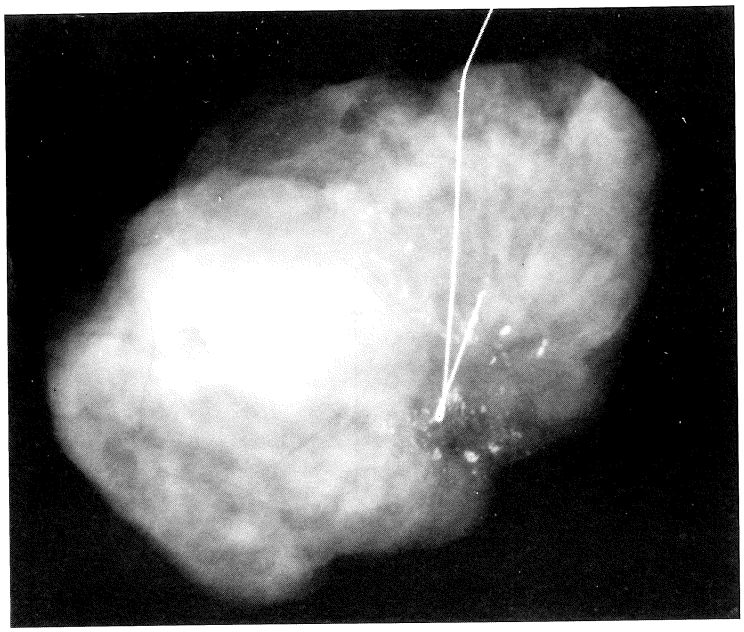

Fig 3: Radiograph of a specimen with the hookwire still attached. The microcalcifications in the specimen are of varying shapes and sizes with some areas showing a ductal distribution. This lesion proved to be intraductal carcinoma.

Specimen radiography, with the hookwire in place, is done to ensure that the abnormal area has been excised (Fig 3).

Of the 39 patients who had prebiopsy localizations, only 11 were asymptomatic women who had come for routine screening (Table I). These 11 women included those on hormone replacement therapy and those with family history of breast carcinoma. All 11 had benign lesions. The positive cases were 3 with history of carcinoma in the opposite breast, 3 who complained of breast lumpiness and 1 with breast pain.

Table I
Indications for mammographic examinations

Indications	Total	No. benign	No. malignant
Routine	11	11	—
Breast pain	8	7	1
CA in opposite breast	6	3	3
Breast lumpiness	6	3	3
Nipple discharge	5	5	—
Other	3*	3	—
Total	39	32	7

* *Includes metastatic deposits in the spine (1), previous plasma cell mastitis (1) and axillary furunculosis (1). CA=carcinoma.*

Table II shows the patients' age distribution. Twenty seven (70%) of the women were between 40 and 59 years. The 7 patients with breast carcinoma were in this age group.

Of the 42 localizations, 48% were for a mass, 40% were for microcalcifications and 12% were for microcalcifications with an associated mass (Table III).

The dominant characteristics of the masses are presented in Table IV. The majority (70%) had poorly defined margins and they were all benign. The 2 malignant masses had spiculated margins.

Microcalcifications accounted for 71% (5/7) of the malignant lesions and 49% (17/35) of the benign lesions. Masses were more likely to be benign, accounting for 51% (18/35) of the benign lesions and 29% (2/7) of the malignant lesions.

The positive biopsy rate was 17% (7/42).

There were a few problems. There were 3 cases of failure to remove the localized lesion. Two of these lesions were subsequently removed and the third patient is being followed-up. There was 1 case of vasovagal reaction with syncope.

The histopathological findings are presented in Table V.

Table II
Age distribution

Age (years)	Total	No. benign	No. malignant
20 - 29	1	1	—
30 - 39	9	9	—
40 - 49	17	12	5
50 - 59	10	8	2
60 - 69	2	2	—
Total	39	32	7

Table III
Nonpalpable breast lesions

Abnormality	Total	No. benign	No. malignant
Mass	20	18	2 (10%)
Microcalcifications	17	13	4 (24%)
Microcalcifications with mass	5	4	1 (20%)
Total	42	35	7 (17%)

Table IV
Mass lesions

Dominant characteristics	Total	No. benign	No. malignant
Spiculated	2	—	2
Poorly defined	14	14	—
Lobulated	4	4	—
Total	20 (100%)	18 (90%)	2 (10%)

Table V
Histopathological findings

Findings	No	%
Malignant lesions		
Intraductal carcinoma	4	9.5%
Infiltrating ductal carcinoma	3	7.0%
Benign lesions		
Fibrocystic disease	21	50.0%
Fibroadenoma	7	16.7%
No malignancy	7	16.7%
Total	42	100%

Discussion

Percutaneous prebiopsy localization of nonpalpable breast lesions was first reported in the 1960s[1]. The purpose of this procedure is to detect breast carcinoma at an early stage. Early diagnosis would decrease the mortality of the disease. At the General Hospital, Kuala Lumpur, this procedure was introduced in October 1989. Since then, localization has become more acceptable and the demand for this service is increasing.

Although mass lesions and microcalcifications may show typical features of malignancy[2,3,4], a large percentage of nonpalpable lesions are indeterminate. Clustered microcalcifications are often a diagnostic problem. Separation between benign and malignant process has been reported to be so imprecise that all clusters of microcalcifications may require biopsy[5,6]. Similarly, there is considerable overlap in appearance of benign and malignant masses. Subtle asymmetrical density and distortion of normal architecture may signify malignancy.

In this study, about 80% of the localized lesions were benign. This makes it all the more important that lesions are accurately localized and excised; the goal of each biopsy being preservation of normal tissue. Numerous methods of localization have been described. The technique of localization used at our centre

has proved to be effective. Further, our improvised hookwire-needle combination has proved to be both effective and cheap.

The 17% positive biopsy rate in this series is lower than most published series, which have a positive biopsy rate of between 20% to 30%[7,8,9]. Moscowitz, however, has advocated a more aggressive approach and suggests a 10% biopsy rate[10].

What would be an appropriate positive biopsy rate? The aim of localizing nonpalpable lesions for biopsy is to detect early breast carcinoma. However, in the attempt to detect smaller and smaller carcinoma, it is inevitable that the positive rate would drop.

It is never easy to decide if a suspicious lesion warrants a biopsy or just close follow-up. Each biopsy means the discomfort of localization, ward admission, surgery under general anaesthesia and the possible consequences of scarring and disfigurement. Conversely, close follow-up would mean the anxiety of frequent mammography for a period of at least 2 to 3 years. All factors considered, a 20% to 30% positive biopsy rate would be an appropriate level.

One way of achieving a higher positive rate would be to institute routine "double" reporting, i.e., each mammogram should be reported independently by 2 radiologists. This would mean double screening and would help in avoiding unnecessary biopsies and therefore increase the positive rate. At present, although "double" reporting is done for the more difficult cases, it has not become the routine for all cases.

The positive biopsy rate provides a valuable feedback to evaluate the performance of a Mammography Unit. The ability to perceive an abnormality requires good images and this is dependent upon dedicated radiographers, good mammographic techniques and good equipment. The ability to determine significance of a mammographic finding depends on proper training, skill and experience of the radiologist. As such, a high positive biopsy rate would reflect better upon the performance of the whole Mammographic Unit.

It has to be emphasised that the surgical removal of a nonpalpable suspicious breast abnormality requires a cooperative effort between radiologist, surgeon and pathologist: beginning with the identification of the abnormality, its localization and removal, to the eventual histopathological examination.

Acknowledgement

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