Extent of Lumpectomy for Breast Cancer After Diagnosis by Stereotactic Core Versus Wire Localization Biopsy

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Background: Stereotactic core biopsy of mammographically defined breast abnormalities is an alternative to wire localization biopsy. The purpose of this study was to evaluate the extent of lumpectomy in patients diagnosed by stereotactic core versus wire localization biopsy.

Methods: A total of 67 consecutive patients diagnosed with invasive cancers or ductal carcinoma in situ (DCIS) were retrospectively reviewed. Thirty-four were diagnosed by core biopsy and the remaining 33 by wire localization biopsy.

Results: Approximately 65% of patients subsequently had breast-conserving surgical therapy. Seventy-nine percent of patients undergoing wire localization biopsies had positive surgical margins. Achievement of negative surgical margins for lumpectomies performed after wire localization or stereotactic core biopsies was 100% and 89%, respectively, which was not significantly different. However, the total volume of breast tissue removed for breast conservation in patients undergoing lumpectomy after wire localization versus core biopsies was 183 cm³ and 104 cm³, respectively, which was significantly different (P = .003).

Conclusions: Diagnosis by stereotactic core biopsies resulted in less tissue removal to achieve margin-negative lumpectomies for breast conservation. Stereotactic core biopsy is the method of choice for biopsying nonpalpable, suspicious breast lesions.

Key Words: Breast cancer—Mammography—Biopsy—Breast conservation.

The use of annual screening mammography has increased the detection of nonpalpable breast lesions requiring biopsy. It is estimated that approximately 500,000 of these lesions are detected annually in the United States.1 Most of these mammographic abnormalities prove to be benign, but approximately 15% are found to be malignant.2 There are different biopsy techniques available for studying these nonpalpable lesions.3 Stereotactic larger core biopsy, an alternative method to diagnose mammographic abnormalities, was first described in 1990 by Parker and coworkers.4 This biopsy technique has been adopted by many practitioners. It costs less than a surgical biopsy5–7 and has been reported to have a high sensitivity and specificity rate in diagnosing8,9 However, there are some difficulties in differentiating between atypical ductal hyperplasia and breast carcinoma.

Wire localization biopsy of nonpalpable breast lesions detected mammographically has been the “gold standard” method for the last three decades. It remains the only technique available in centers where stereotactic core facilities are not available. It is more invasive than stereotactic core biopsy, because it requires an operative approach and leaves a scar.

In this report, we compared the utility of these biopsy procedures in patients subsequently diagnosed with breast cancer. Specifically, we examined the surgical outcomes of patients who went on to receive lumpectomies for breast conservation.

MATERIALS AND METHODS

Subjects
A total of 337 patients identified as having moderately to highly suspicious mammographic lesions underwent biopsies during the period from April 1996 to April 1998.

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at the University of Michigan Medical Center. Of those patients, 147 and 190 patients had either stereotactic core or wire localization biopsies, respectively. A total of 67 of these patients (20%) who were found to have invasive or noninvasive cancers made up the group analyzed in this study. Patients diagnosed with lobular carcinoma in situ only were excluded from the study. Four surgical oncologists within the Division of Surgical Oncology performed the wire localization biopsies and definitive surgical procedures. The decision whether to perform a wire localization biopsy versus a stereotactic core biopsy was made jointly by the surgeons in consultation with the mammographers. If a mammographic lesion could be biopsied by either technique, the surgeon presented the options to the individual patient to allow the patient to make an informed choice. In our early experience with the stereotactic core biopsy apparatus, fewer attempts were made by the mammographers to biopsy microcalcifications in contrast to mass lesions. This was not the case in the latter part of the study period after more experience with the technique had been acquired. The decision of what definitive surgical procedure should be performed (breast conservation versus mastectomy) was made by the patient after consultation with the multidisciplinary team of healthcare providers at the Breast Care Center of the University of Michigan Cancer Center. Medical records were reviewed for patient demographics, mammographic findings, pathological characteristics, and the definitive surgical procedures.

**Wire Localization**

The skin surface closest to the lesion was chosen. The breast was compressed with the patient in a sitting position, and an alphanumeric fenestrated paddle was placed over the suspicious abnormality. Coordinates were transferred onto the skin, and a 21-gauge hook-wire apparatus (Kopans Spring Hook Localizer Needle, Wire Loc Cook, Bloomington, IN) was inserted into the breast following local anesthesia with 1% lidocaine. After needle placement, orthogonal views were obtained to determine the correct depth. A hook-wire was then deployed through the needle, which was subsequently withdrawn. The hook-wire usually was placed with the reinforced portion within the lesion and the tip of the wire extending beyond it. Craniocaudal and lateral mammographic views were obtained with the hook-wire in place. These views were labeled and submitted with the patient to the surgeon for subsequent operative procedure. The excisional biopsy was performed in an operating room suite using a combination of a local anesthetic and intravenous sedation. Specimen radiography was performed to confirm lesion excision.

**Stereotactic Core Biopsy**

The breast was suspended through the aperture of a dedicated prone digital breast biopsy table. Following compression and identification of the suspicious abnormality, stereotactic pairs of images were obtained at 15° off center. The suspicious lesion was identified on both stereotactic images on a video terminal, and its location was determined using the software package employing geometric formulas that assess the relative movement of the index lesion on the stereotactic pairs. A 14- or 11-gauge vacuum-assisted needle (Core Needles Biopsys MammoTome TM needle, Biopsys Medical, Irvine, CA) was then inserted into the compressed breast at the correct coordinates following local anesthesia with lidocaine. A “prefire” stereotactic pair was obtained to document correct needle location. This was followed by “postfire” stereotactic pairs after the needle had been advanced mechanically through the lesion. Following confirmation of needle location, vacuum-assisted core biopsy samples of the lesion were obtained. Generally, at least 12 samples were taken. If calcifications were present, a specimen radiograph was obtained to confirm retrieval. Mammographic/pathologic concordance was determined when the pathology results were available. Discordant results led to recommendation for wire-localized surgical biopsy.

**Local Breast Excision Techniques**

Wire localization biopsies were performed for diagnostic purposes. A radius of at least 1 cm to 2 cm of breast tissue from the wire was excised. A specimen radiograph was performed to confirm that an adequate sample of tissue had been obtained.

In the setting of a confirmed diagnosis of malignancy (i.e., after stereotactic core or wire localization biopsy) a margin-negative lumpectomy was attempted in patients deemed to be candidates for breast conservation. This entailed a wire localization lumpectomy for patients previously diagnosed by stereotactic core biopsy. The technique is similar to that described above in which breast tissue was excised in an effort to achieve negative surgical margins. For patients who had had a prior wire localization biopsy in whom the malignant lesion involved the surgical margin, a re-excision lumpectomy was performed. This procedure involved excising the previous biopsy skin incision in continuity with the underlying breast tissue surrounding the biopsy site, with an effort made not to enter the biopsy cavity.

All breast excision specimens were inked for evaluation of the margin status. Tumor cells present at the margin or less than 3 mm away from the margin were considered positive.