

Risk of Needle-track Seeding After Diagnostic Image-guided Core Needle Biopsy in Breast Cancer

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ABSTRACT

Objective: Image-guided core needle biopsy (IGCNB) is an accepted technique for sampling nonpalpable mammographically detected suspicious breast lesions. However, the concern for needle-track seeding in malignant lesions remains. An alternative to IGCNB is needle-localization breast biopsy (NLBB). No study has been done to compare the local recurrence rate of breast cancer after IGCNB versus NLBB.

Methods: We have retrospectively reviewed the local recurrence of breast cancer in patients diagnosed by either IGCNB or NLBB who underwent breast-preserving treatment for their cancer between May 1990 and June 1995. The length of follow-up averaged 29.7 months.

Results: Three hundred ninety-eight patients were diagnosed with breast cancer by IGCNB (297 patients) or NLBB (101 patients). All patients underwent breast-conserving surgery. Fifteen (3.77%) patients had a local recurrence: 11(3.70%) in the IGCNB group and 4 (3.96%) in the NLBB group. These recurrence rates are not statistically different.

Conclusion: Concerns for seeding of the needle track with cancer cells have made some surgeons wary of IGCNB. However, we did not find an increased rate of recurrence due to needle-track seeding, and IGCNB remains our procedure of choice for diagnosing mammographically detected suspicious breast lesions.

Key Words: Image-guided core needle biopsy, Breast cancer, Mammography.

INTRODUCTION

Image-guided breast biopsy via core needle biopsy (IGCNB) is an accurate and cost-efficient technique for sampling nonpalpable breast lesions detected mammographically. Image-guided core needle biopsy has replaced needle localization breast biopsy (NLBB) as our procedure of choice in sampling these suspicious, nonpalpable mammographic lesions. The advantages of IGCNB versus NLBB have been well documented.¹⁻³ Image-guided core needle biopsy is minimally invasive and has favorable cosmetic results. It is much less costly than surgical biopsy. In addition, IGCNB can be set up and performed quickly, and patients are able to return to their usual activities immediately after the procedure.

Despite its strengths, many surgeons still express concern for malignant seeding of the needle track during IGCNB. Harter et al³ have reported the only known case in the literature. In this case, a stereotactic core needle biopsy was performed that showed mucinous infiltrating ductal carcinoma. Two weeks following IGCNB, the patients underwent wide local excision of the biopsy site. An area of firmness in the surgical specimen demonstrated early organizing hemorrhage with associated macrophages, which is consistent with a healing needle track. Within the track were several nests of mucinous carcinoma cells.

To definitively attribute a local recurrence of breast cancer to seeding from a needle track, one would have to prove that the needle track was left behind and then demonstrate microscopic evidence of cancer cells in the needle track. It would be impossible for us to demonstrate that for the 398 patients in our study. Therefore, we assume that local recurrence in the breast is a possible indicator of needle-track recurrence. As such, the incidence of needle-track recurrence should be lower than the total incidence of local recurrence of breast cancer.

At present, no study has been done to assess the local recurrence rate of breast cancer after IGCNB versus NLBB. We have retrospectively reviewed the local recurrence of breast cancer in patients diagnosed by either IGCNB or NLBB who underwent breast-preserving treatment for their cancer. We expected no difference in the

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Table 1.
Diagnostic Modalities and Recurrence Rates

Diagnostic Modality*	Number of Patients	Number of Local Recurrences	Local Recurrence Rate
IGCNB	297	11	3.70%
NLBB	101	4	3.96%
TOTAL	398	15	3.77%

*IGCNB = image-guided core needle breast biopsy; NLBB = needle localization breast biopsy.

Table 2.
Treatment Modalities and Recurrence Rates

Treatment Modality*	Number of Patients	Number of Local Recurrences	Local Recurrence Rate
Lump	24	3	12.5%
Lump-ax	61	1	1.6%
Lump-XRT	32	0	0%
Lump-ax-XRT	281	11	3.91%
Total	398	15	3.77%

*Lump = lumpectomy, ax = axillary node dissection, XRT = radiation therapy.

local recurrence rate of breast cancer, demonstrating the safety of the IGCNB technique regarding this concern.

MATERIALS AND METHODS

Between May 1990 and June 1995, 398 patients were diagnosed with breast cancer by IGCNB (297) or NLBB (101) (**Table 1**). Image-guided core needle biopsies were performed with a Bard 23-mm automated core bioptr with a 14-gauge needle under stereotactic or ultrasound guidance. Needle localizations were performed free-hand with grid-guided placement of the hook-wire. All patients subsequently had breast-conserving therapy with lumpectomy with axillary dissection, radiation therapy, or both (**Table 2**). Patients were followed for a mean of 29.7 months (range 2 to 90 months). The data were analyzed with Fischer's exact test. No specific attempt was made to excise the biopsy needle track at the definitive surgery; however, we recognize that the track was excised in many cases.

RESULTS

Fifteen (3.77%) of 398 patients had local recurrence of

their breast cancer: eleven (3.70%) of 297 in the IGCNB group and 4 (3.96%) of 101 in the NLBB group. These recurrence rates are not statistically significant ($p = 1.0$). Local recurrence of breast cancer in the setting of breast-conserving therapy with radiation ranges from 4% to 10% over 12 years.⁴⁻⁶ However, most local recurrences occur within 24 months. Our recurrence rates for patients who did not undergo radiation therapy were 12.5% for lumpectomy alone and 1.6% for lumpectomy with axillary dissection. The difference in this recurrence rate is not statistically significant ($p = 0.68$) and is most likely due to the small sample size. For patients who had radiation therapy, the local recurrence rate totaled 3.51%. Our data objectively demonstrate that IGCNB does not have an increased rate of local recurrence due to seeding of the needle track compared with NLBB.

DISCUSSION

Image-guided core needle biopsy is our favored method for sampling nonpalpable but suspicious mammographic lesions. Concern for cancer seeding of the needle track has made some clinicians wary of this technique, but our data do not support this fear. The potential exists for

seeding after any penetration of a malignancy, whether it be image-guided core needle biopsy, needle-localization breast biopsy, or fine-needle aspiration.⁷ Following breast-conserving therapy for cancer, radiation therapy should destroy any malignant cells remaining in a needle track. On occasion, the needle track may be excised with the lumpectomy specimen. Image-guided core needle biopsy is favored for its high sensitivity (>90%),¹ low cost, time efficiency, cosmetic results, and minimal morbidity.

CONCLUSION

We conclude that IGCNB does not have an increased risk for needle-track seeding compared with NLBB, and IGCNB remains our procedure

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Disclosure: None of the authors of this article have any financial interest in the subject of this article.