

Breast cancer recurrence in the core needle biopsy site: is it a real or a theoretical risk?

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ABSTRACT: Breast needle biopsy is commonly used to confirm breast cancer diagnosis with minimal invasiveness. The risk of cancer recurrence in the site of the core needle biopsy represents up till now a concern. This risk exists theoretically, though it is hard to make clinical evidence. In this article we have studied a 46-year-old woman presented with a skin nodule at the site of biopsy after breast conserving surgery for invasive ductal carcinoma. Histological examination proved local recurrence of primary breast cancer. The possibility of such consequence has to be taken in consideration when performing needle biopsies.

KEYWORDS: Breast cancer, Core needle biopsy, local recurrence.

1 INTRODUCTION

Core needle biopsy (CNB) of the breast has improved significantly preoperative management of breast disease. Moreover, CNB allows reducing cost, procedure time and complications compared with surgical biopsy. The large application of this technique has generated safety issues. The potential risk of needle track seeding into adjacent tissues and the impact on survival were debated since the 1950s [1]. This report represents a clinical and histological evidence of breast cancer recurrence at the site of CNB.

2 CASE PRESENTATION

A 46-year-old woman presented with a nodule of the right breast that was self-detected three weeks before consultation. The patient had no breast cancer risk factor. Clinically, the nodule was in the upper-inner quadrant, with irregular shape and measured 35 mm. Mammography showed a highly suspicious mass (fig. 1). The tumor was staged by UICC classification as T2 N1 M0.



Fig. 1: Mediolateral oblique view mammography showed hyperdense and ill-defined lesion of the right breast

The patient had, in March 2012, a core needle biopsy with 9 shots using a 16-gauge needle. Histopathology showed a grade 2 invasive ductal carcinoma (fig. 2).

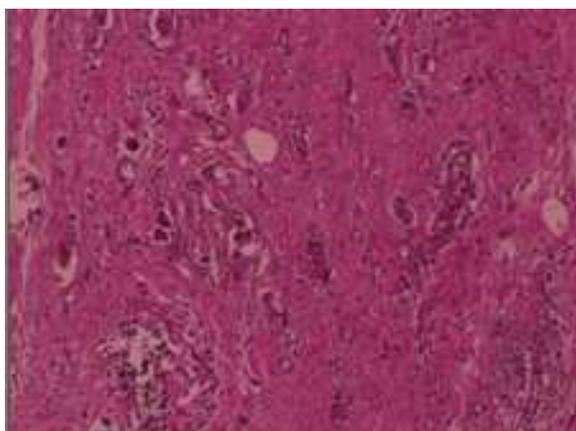


Fig. 2: Histopathology findings of the core needle biopsy: ductal cells proliferation in tubules and nests (H&E, ob. x100)

Three weeks after biopsy, the patient began receiving neoadjuvant chemotherapy (consisting of four cycles of fluorouracil, epirubicin and cyclophosphamide). A partial response to chemotherapy was noted with persistence of a 2.5 cm sized nodule. Breast conserving surgery was performed in June 2012. The removed specimens revealed on section a grayish white tumor that sized 28 mm in diameter. Microscopy illustrated a grade 2 invasive ductal carcinoma completely removed with safe margins. Twenty one axillary lymph nodes were taken, from which 11 were invaded. Receptor analysis was negative for estrogen and progesterone. Human epidermal growth factor (HER2) was score 0. In September 2012, in course of adjuvant chemotherapy, a skin lesion was marked in the site of core needle biopsy. A surgical biopsy of this lesion confirmed the skin recurrence of the same histological type cancer (fig. 3).

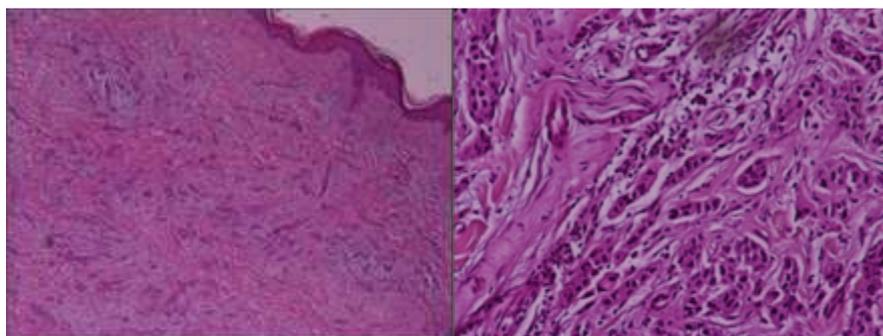


Fig. 3: Histopathology findings of the skin lesion showing ductal cells proliferation in the dermis identical to the original lesion (H&E, ob. X40 (a), x200 (b)).

Therefore, Mastectomy was performed. In three months of surgery, the patient developed local recurrence and hepatic metastases. Chemotherapy was indicated.

3 DISCUSSION

Skin metastasis can occur by direct invasion, lymphatic or vascular spread as well as by iatrogenic migration. Epithelial displacement is confirmed if cell clusters are histologically identical to the primary tumor mass and if residual fragments are not be bounded by basement membrane or specialized mammary stromal tissue [2].

Perineal and abdominal puncters are a known site of cutaneous tumor cells implantation after needle procedures. The first case of malignant seeding of the needle track after a large-core biopsy of a mucinous carcinoma of the breast was documented by Hater et al in 1992 [3].

While clinical recurrence at the site of needle biopsy has been infrequently reported, the histological facts of malignant cell spread following needle biopsy are well documented. Boppana et al [4] reported 36 cases of epithelial migration after fine-needle aspiration biopsy in 100 patients with breast cancer. Youngson et al reviewed slides from patients with breast carcinoma who underwent surgical excision following CNB, and they reported tumor displacement in 12 (28%) of 43 cases. Diaz et al series [5] involved 352 patients; all cases had undergone CNB and pathological exam of the excised specimen. Tumor cell displacement figured in about one-third of patients (114 cases).

Uematsu and Kasami [6] aimed to predict the risk of needle tract seeding of breast cancer from cytological analysis of core needle wash material. The study included image-guided CNB of 207 breast cancers. The theoretic risk of tumor cell seeding was estimated to be 69%.

Adjuvant therapy, particularly radiation therapy, and the host immune response may explain the fact that local recurrence from seeding of the needle tract does not occur so frequently. In fact, a study led by Fitzal et al, analyzing 719 patients after breast conserving surgery and postoperative radiotherapy demonstrated that preoperative core needle biopsy did not significantly influence the local free recurrence rate and overall survival.

Clinical evidence of recurrent breast cancer after CNB was examined by Loughran and Keeling [7]. Nine papers were reviewed with an overall patient number of 1575. Chao et al [8] described two cases of breast cancer recurrence at the site of stereotactic biopsy following mastectomy without excising biopsy puncture. The authors concluded that biopsy site excision at the time of the surgery is recommended. For analyzing the incidence of breast cancer recurrence, Thurfjell et al [9] focused on a series of 303 cases with non-palpable breast cancer treated by conserving surgery. Seventy one percent (214/303) of the patients had CNB. Local recurrence happened in 11% (33/303) of the cases. The absence of complementary radiotherapy can explain the high rate of recurrence. In other research trials, the recurrence rate for breast invasive carcinomas was 3% when post-surgical radiotherapy was applied, but was 34% where it was omitted.

Reviewing literature, recurrences after preoperative needle biopsy were noticed to occur in a delay of 12 to 23 months [8, 10]. The risk of tumor cell displacement depends on the histological type and tumor grade; it was more frequently observed in invasive ductal carcinoma than in invasive lobular carcinoma [5]. Recurrence at the site of needle biopsy was documented after either conserving surgery or mastectomy. Adjuvant therapy was found to influence the risk. However needle size and the number of passes were not associated with an increased incidence of local recurrence. CNB and surgical biopsies present the same risk of malignant cell displacement [11].

Based on the evidence of breast cancer recurrence in the site of CNB, we recommend excising the biopsy site in the same time of surgery. Therefore the site of biopsy shall be included in the area of eventual incision of tumorectomy.

4 CONCLUSION

Reviews focusing in the incidence of local recurrence at the puncture of needle breast biopsy found analysis complexity remaining to the limited number of reported cases and various biases like confounding factors, selection of cases and controls. Nevertheless clinical and histological proofs of recurrence exist. Our reported case highlights the importance of excising the needle tract at the time of definitive surgery.

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