

# Use of Radioactive Seed to Localize Axillary Lymph Node in Breast Cancers

Hamza Aziz\*, Randall Scheri, Jay Baker and E Shelley Hwang

Department of Surgery, Division of Surgical Oncology, Duke University Medical Center, Durham, NC, USA

## Abstract

**Introduction:** Axillary lymph node biopsy in an irradiated or previously operated axilla can be technically challenging. Radio-labeled seed localized (RSL) biopsy is an emerging modality for localizing tissue of interest that is not amenable to wire localization.

**Case Report:** A 60 year old female with history of breast cancer presented ten months after her initial resection with a new chest wall mass and an enlarged right axillary lymph node situated posterior and superior to the axillary vein. Given its location, wire localization was not possible and on the other hand operating without localization was too risky. We elected to place a 125I labeled titanium seed in the lymph node which greatly facilitated this otherwise difficult dissection and safely delivered the specimen needed for diagnostic purposes.

**Discussion:** With the advancement of imaging technology, surgeons are able to safely and accurately recover diagnostic tissue specimen from extremely challenging anatomic spaces. Radio-labeled seed localization is another step in furthering surgical capabilities in this regard. RSL provides several advantages over wire localization: placement in lesions located deep in body cavities, seed placement can be scheduled a day prior to surgery thus making it more easier on patients, and no risk of cutting or dislodging the wire.

**Clinical practice points:** The use of radio-labeled seed localized (RSL) breast biopsy is growing in popularity and is replacing wire localized breast biopsy.

We present a case of a radioactive seed localized axillary lymph node resection that was not amenable to wire localization. Radioactive seed allowed precise localization of the node in a difficult anatomic location, thus facilitating successful resection of the node.

Seed localization is a versatile approach for localizing lesions of interest and holds promise for not only breast surgery, but also for marking nodes or lesions of interest that are located deep in the abdominal or thoracic cavity.

**Keywords:** Breast cancer; Radio-active seed localization; Axillary node dissection

## Introduction

Breast cancer surgery has made significant advances with recent technologic improvements in the ability to image and localize non-palpable breast lesions. This greater precision has allowed breast surgeons to resect lesions with improved oncologic and cosmetic outcomes. Wire localized breast biopsy has been the standard approach for localizing non-palpable breast lesions, but over the past decade, the use of radioactive seed localization (RSL) has increased in popularity [1]. Originally approved for interstitial treatment of prostate cancer, lower dosed 125I labeled titanium seeds are being used off-label for localizing breast lesions [2]. We report an interesting case of a 60 year old female with breast cancer who presented with an enlarged axillary lymph node that was localized and resects with the help of seed localization.

## Case Report

A 60-year-old woman with a history of a T2N0, ER+/PR -, HER2 amplified, Invasive Ductal Carcinoma (IDC) of the right breast underwent simple mastectomy and sentinel lymph node biopsy. All of the margins were negative and she had no nodal disease. This was followed by adjuvant chemotherapy along with initiation of anastrozole. Ten months later, on a routine clinic visit, her physician palpated an enlarged right axillary mass. Pathology from fine needle aspiration of the mass revealed an ER/PR negative and Her 2 amplified IDC. A PET scan showed a hypermetabolic focus in the right axilla without evidence of more distant metastatic disease. The patient received additional chemotherapy with adriamycin and cyclophosphamide prior to undergoing axillary dissection including resection of the

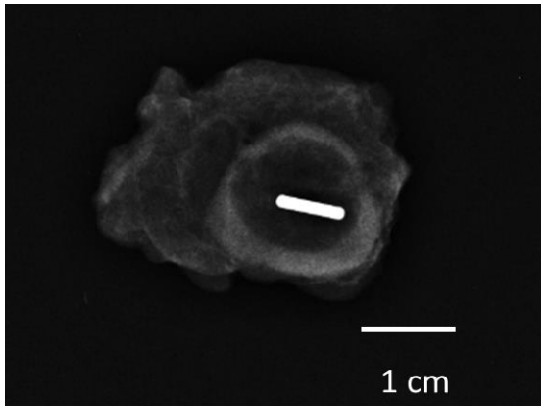
axillary mass and level 3 lymph nodes. Pathology revealed breast carcinoma completely replacing a single node without additional nodal involvement. After two months, the patient presented for mammography at which time a new suspicious mass was palpated along her chest wall. Ultrasonography showed a 1 cm nodule in the subcutaneous tissue of the axilla as well as an enlarged level 3 axillary lymph node. Biopsy of the subcutaneous axillary mass confirmed it to be metastatic breast cancer. The mass was fairly superficial and easily resectable. The lymph node, on the other hand, was situated posterior and superior to the axillary vein and was difficult to approach. Recent prior axillary dissection added to the difficulty of the case. Wire localization of the lesion carried significant risk as the hook of the wire would have abutted the axillary vein potentially leading to trauma. Therefore, a radioactive seed was placed into this lymph node under ultrasound guidance. Intra-operatively, a gamma probe was used to locate the lymph node of interest. Intra-operative specimen radiograph confirmed the presence of the seed in resects node of interest (Figure 1). Pathology revealed the node was reactive without evidence of metastatic disease.

**\*Corresponding author:** Hamza Aziz, Department of Surgery, Division of Surgical Oncology, Duke University Medical Center, Durham, NC, USA, Tel: 919-327-7433; E-mail: [haziz2@jhmi.edu](mailto:haziz2@jhmi.edu)

**Received** April 30, 2015; **Accepted** June 24, 2015; **Published** June 29, 2015

**Citation:** Aziz H, Scheri R, Baker J, Hwang ES (2015) Use of Radioactive Seed to Localize Axillary Lymph Node in Breast Cancer. *Surgery Curr Res* 5: 236. doi:10.4172/2161-1076.1000236

**Copyright:** © 2015 Aziz H, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.



**Figure 1:** Specimen radiograph of excised lymph node with iodine-125 labeled titanium seed in center of targeted node.

## Discussion

Wire localization has been the standard of care for marking non-palpable breast lesions. This technique has certain drawbacks including migration [3-5] transaction [6], and need for same day operation. Radioactive seed localization (RSL) uses a  $^{125}\text{I}$ -labeled titanium seed that is approximately  $4.5 \times 0.8$  mm in size with a half-life of approximately 60 days [2]. The seed can be placed up to five days before surgery, which facilitates scheduling operation especially in the outpatient setting. Its small size and ease of placement gives it the advantage of reaching lesions that are buried deep in a body cavity or, as in this case, in proximity to major vasculature. There is limited experience with this technique in identifying non-breast lesions. Grotz et al. reported a series of 8 patients who underwent localization of non-breast lesions in the groin and axilla from recurrent melanoma and

breast cancer [2]. We report the use of radioactive seed localization to identify an enlarged lymph node that was not amenable to wire localization. Using the seed and intraoperative gamma probe guidance, the node of interest was quickly identified and successfully resected.

## Conclusion

This case demonstrates the use of radioactive seed to localize a structure that was not amenable to wire localization. We used a radioactive seed for the resection of a level 3 axillary lymph node in a patient with two prior axillary surgeries and six cycles of chemotherapy. In addition, the location of the lymph node was located superior and posterior to the axillary vein, an area that was especially challenging in this patient. Preoperative seed placement into the node of interest allowed a faster and more focused dissection. RSL is a versatile technique that provides a number of advantages over wire localization. More experience with RSL should help bring this modality into wider use for breast and non-breast lesion localization.

## References

1. Jakub JW, Gray RJ, Degnim AC, Boughey JC, Gardner M, et al. (2010) Current status of radioactive seed for localization of non palpable breast lesions. *Am J Surg* 199: 522-528.
2. Grotz, Travis E, Tortorelli, Cindy L, Degnim, et al. (2010) The use of radioactive seed localization for non-palpable non-breast lesions. *J Surg Radiol* 1: 90-95.
3. Bronstein AD, Kilcoyne RF, Moe RE (1988) Complications of needle localization of foreign bodies and nonpalpable breast lesions. *Arch of Surg* 123: 775-779.
4. van Susante JL, Barendregt WB, Bruggink ED (1998) Migration of the guide-wire into the pleural cavity after needle localization of breast lesions. *Eur J Surg Oncol* 24: 446-448.
5. Mituś J, Kołodziejcki L, Dyczek S, Wysocki WM, Komorowski AL (2004) Localization Wire Migrating into the Hilum of the Lung During Wire-Guided Breast Biopsy. *Breast J* 10: 165-166.
6. Homer MJ (1983) Transection of the localization hooked wire during breast biopsy. *Amr J Roentgenol* 141: 929-930.