

## UNUSUAL LYMPHATIC DRAINAGE TO CONTRALATERAL ROTTER'S LYMPH NODES IN BREAST CANCER: A SPECT/TC LYMPHOSCINTIGRAPHY CASE STUDY

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### ABSTRACT

Lymphatic drainage of the breast occurs mainly in ipsilateral axillary nodes, but up to 20–30% of cases may present drainage to other locations, although it is usually coupled to ipsilateral axillary nodes. Contralateral axillary drainage in daily clinical practice is very rare (0-2%), even more without associated ipsilateral drainage. We present the case of a 71-year-old woman with a personal history of ductal/lobular carcinoma at 49 years on the left breast and a second primary invasive lobular carcinoma in the right breast. Preoperative lymphoscintigraphy showed absence of lymphatic drainage in the ipsilateral axilla but unusual lymphatic drainage was detected in the contralateral Rotter's lymph nodes as confirmed by SPECT/TC imaging.

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## 1. Introduction

Lymphatic drainage of the breast occurs mainly in ipsilateral axillary nodes, but up to 20–30% of cases may present drainage to other locations, although it is usually coupled to ipsilateral axillary nodes. Drainage to extra-axillary lymph nodes takes place mostly in the internal mammary chain, intramammary lymph nodes, supra-and infraclavicular fossae and interpectoral region [1,2]. Contralateral axillary drainage in daily clinical practice is very rare (0-2%), even more without associated ipsilateral drainage [3]. We describe unusual lymphatic contralateral drainage in a patient with a second primary breast tumor occurring after a personal history of breast cancer 22 years earlier.

## 2. Case presentation

A 71-year-old female with a personal history of an invasive tumor invasive ductal/lobular carcinoma at 49 years on the left (L) breast treated with skin-sparing mastectomy, axillary dissection, immediate implant reconstruction and reduction mammoplasty on the right side. In June 2020 a follow-up mammography detected a second primary invasive lobular carcinoma on the lower-inner quadrant of the right breast. The patient didn't have clinically palpation lymph nodes and the ultrasound was negative axillae bilaterally. Preoperative lymphoscintigraphy showed absence of lymphatic drainage in the ipsilateral axilla in early and late images, while unusual lymphatic drainage was detected in the contralateral hemitorax during early stage scan (Figure 1). We decided to perform SPECT/TC in order to visualize sentinel nodes, provide their exact number and proper anatomical location to adjust for intraoperative procedures [4].

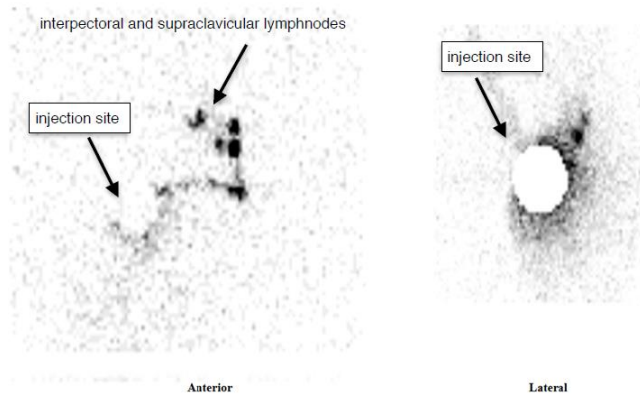
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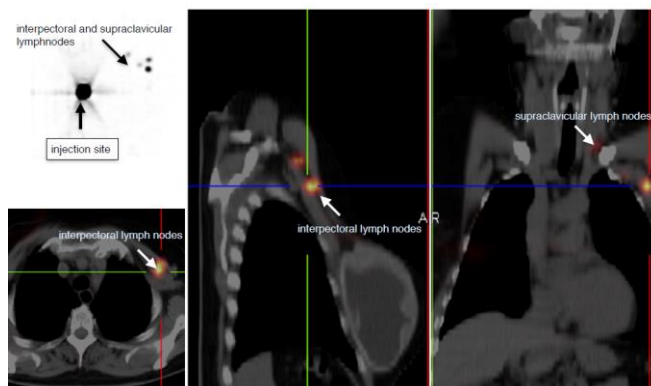
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Imaging showed 3 high intensity uptake areas on the left interpectoral fascia along the pectoral branches of the thoracoacromial vessels also called Rotter's lymph nodes between pectoralis major and minor and one supraclavicular lymph node with lower uptake respect the others on the same side. The day after the exam, the patient underwent breast-conserving surgery on the right with sentinel node biopsy on the left Rotter's space. One sentinel hot spot node was identified with the gamma probe and other nodes were intramuscular and deep located with low intensity for the probe detection and supraclavicular have a very low intensity (Figures 2).

The patient underwent at breast-conserving surgery on the right mammary gland with sentinel node biopsy on the left Rotter's space. Final pathology was an ER-positive invasive lobular carcinoma and the sentinel contralateral Rotter's space node was negative for metastatic deposits.



**Figure 1. Lymphatic mapping using lymphoscintigraphy with  $^{99}\text{Tc}$ -nanocolloid showing drainage in contralateral sentinel node in (Rotter's space). Planar imaging in interior and lateral view.**



**Figure 2. SPECT/TC imaging Rotter's lymphnodes located between the pectoralis major and the pectoralis minor muscles with high intensity and one lymphnodes located in supraclavicular with low intensity.**

### 3. Discussion

Surgeons also commonly identify Rotter's or interpectoral nodes that are located between the pectoralis major and minor muscles. These Rotter's nodes may further drain into the central or subclavicular node groups representing a possible "skip pathway" for tumor cells to metastasize from the breast to level III nodes while bypassing levels I or II [5].

Although axillary drainage is the principal lymphatic path of the breast, the breast lymphatic vessels drain to infraclavicular systems and interpectoral fascia less frequently, for that reason this site represents a potential site of locoregional recurrence [6]. According to the concept of the American Joint Committee on Cancer, interpectoral lymph nodes (Rotter's) are also considered to be axillary lymph nodes and should be grouped in level II. Normally extra-axillary lymph node drainage sites is not a standard practice but in this scenario lymph node status may provide useful information for staging purposes, and radiotherapy decisions.

Reported experience shows that previous history of aesthetic surgery of the breast does not represent a contraindication for sentinel node biopsy [7]. However, the approach cannot be standardized in the scenario of extra-axillary sentinel lymph node location. The question that arose in our case was if the contralateral drainage was due to collateral circulation 22 years after reduction mammoplasty or due to lymphatic blockage for ipsilateral massive metastatic regional disease. A negative physical exam and ultrasound of the right axilla suggested the second hypothesis was unlikely.

Management of such cases remains controversial. Some consider recent mammoplasty a relative contraindication for sentinel node biopsy, due to the fact that it can disturb the anatomic drainage towards the axilla and hinder the detection of sentinel nodes [8]. In contrast, there is no data discouraging the use of the sentinel node technique when the procedure is not recent [7]. Some reported cases have performed upfront ipsilateral axillary dissection, which we consider unjustified. As we know by the literature the absence of ipsilateral sentinel node drainage is not always a consequence of metastatic blockade, but it could also happen after anatomical drainage disruption due to previous surgery. [9]. Moreover, drainage to contralateral lymph nodes occurring on late images could be suspicious for ipsilateral metastasis, whereas in our patient, contralateral uptake was detected early in lymph nodes and in afferent lymphatic vessels. This was confirmed by SPECT-CT and the day after was performed the biopsy of sentinel node in the contralateral Rotter's space lymph nodes. It demonstrates the usefulness SPECT/CT imaging modality, for the detection of different site of sentinel nodes, not always in conventional site, as in our patient in the right axilla. Proceeding with sentinel node dissection was considered a reasonable choice in this setting. On final pathology report she had a 12 mm ER-positive invasive lobular carcinoma and the sentinel contralateral Rotter's space node was negative for metastatic deposits. The patient was placed on aromatase inhibitor, received whole breast radiotherapy on right and is getting genetic evaluation for family information purposes. The patient currently has no evidence of disease.

#### 4. Conclusions

This is a rare case of biopsy of sentinel node in the contralateral Rotter's space lymph nodes. It demonstrates the usefulness SPECT/CT imaging modality to detect extra-axillary nodes which are not detected by conventional scans. The exact location of extra-axillary nodes is essential for the planning and execution of the surgery. As in our case, the absence of ipsilateral sentinel node drainage is not always a consequence of metastatic blockade, but it could also happen after anatomical drainage disruption due to previous surgery.

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