

Radiotracer re-injection in case of sentinel node non-visualization in a breast cancer patient

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(Received 21 May 2016, Revised 5 August 2016, Accepted 8 August 2016)

ABSTRACT

We reported a 35 year old breast cancer patient who was referred to our nuclear medicine department for sentinel node mapping. She was planned to undergo mastectomy and lymphatic mapping. A dose of Tc-99m Phytate was injection in the peri-areolar region in an intra-dermal fashion. Two hours post-injection no sentinel node was visible in the axilla. Due to a high liver uptake, inadvertent intra-vascular injection was suspected and another dose of the radiotracer was injected in the breast. Lymphoscintigraphy two minutes post-injection showed an axillary sentinel node. Our case underscores the importance of second radiotracer injection in case of sentinel node non-visualization.

Key words: Re-injection; Sentinel; Lymphoscintigraphy; Non-visualization; Breast

Iran J Nucl Med 2017;25(1):70-72

Published: January, 2017

<http://irjnm.tums.ac.ir>

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INTRODUCTION

Sentinel node mapping is an alternative method for surgical lymph node staging of solid tumors [1-3]. Lymphoscintigraphy is considered an integral part of sentinel node mapping as imaging can be very useful for pre-operative localization of the sentinel nodes as well as identifying a group of patients with sentinel node non-visualization [4-9].

Some groups have proposed a radiotracer re-injection in patients with sentinel node non-visualization on lymphoscintigraphy of breast cancer patients [10, 11]. In the current case, we report a breast cancer patient with sentinel node non-visualization in whom re-injection of the radiotracer was successful in localization of the axillary sentinel node.

CASE REPORT

A 35 year old female with the core-needle biopsy proven invasive ductal carcinoma of the right breast was referred to our department for lymphoscintigraphy and sentinel node mapping. The patient was injection with a single dose (1 mCi/0.1 cc) of Tc-99m Phytate in the peri-areolar area and intra-dermal fashion. Lymphoscintigraphy was done five minutes post-injection using a dual head variable angle gamma camera in Anterior and Lateral views (5 minutes/image using a high energy high resolution collimator, 256×256 matrix, and Tc-99m photopeak) [12-15]. Sentinel node was not visualized (image not shown) and delayed lymphoscintigraphy two hours post-injection was done with the same imaging protocol. No axillary sentinel node was visible on the delayed images either (Figure 1).

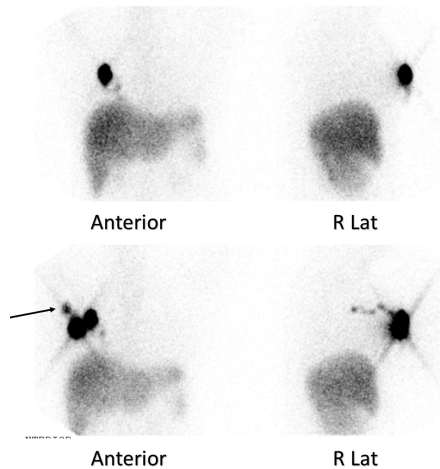


Fig 1. Lymphoscintigraphy images of the patient. No sentinel node visualization after the first injection (upper row). Note high liver uptake and faint star artifact of the injection site which are unusual. Lymph vessel and sentinel node (arrow) could be visualized immediately after second injection (lower row).

Relatively high liver uptake and very faint star artifact at the injection site rose the suspicion of inadvertent intra-vascular injection of the tracer.

Another dose (0.5 mCi/0.1 cc) of the radiotracer was injected in the breast next to the first injection site in similar fashion. Two minutes post-injection, lymphoscintigraphy images were obtained using the same imaging protocol. This time a hot sentinel node in the right axilla was visible (arrow in Figure 1). Next morning the patient underwent mastectomy and axillary sentinel node mapping using a gamma probe. An axillary sentinel node was harvested which was not pathologically involved and no axillary lymph node dissection was done.

DISCUSSION

Sentinel node non-visualization on pre-operative lymphoscintigraphy is an important finding and is usually associated with sentinel node detection failure intra-operatively [16]. Sentinel node detection failure is usually due to lymphatic basin tumor involvement which impedes the radiotracer movement in the lymphatic system [5, 17]. However, possibility of technical errors should always be born in mind in case of sentinel node non-visualization [14, 16, 18]. In our case, High uptake of the radiotracer in the liver and low injection site count (as faint star artifact), rose the suspicion of possible inadvertent intravascular injection of the radiotracer. We re-injected the radiotracer and immediate post-injection lymphoscintigraphy images showed lymphatic flow to the axilla.

Thus far, only two groups reported their experience on re-injection of the radiotracer in breast cancer patients with sentinel node non-visualization on lymphoscintigraphy [10, 11]. Both studies showed sentinel node visualization after re-injection in considerable number of patients and both studies concluded that radiotracer re-injection is a safe method in breast cancer patients. However, both studies also reported logistic problems of re-injection due to interference with operation room schedule as well as concerns regarding radiation received by the patients. None of these studies recommended any guide as which patients really need re-injection.

Our case showed the importance of auxiliary findings (such as hot liver) which denotes to possible technical faults during injection of the tracer. We recommend re-evaluation of the sentinel node technique in patients with sentinel node non-visualization. In case of possible technical problems, re-injection should be considered.

CONCLUSION

In conclusion, radiotracer re-injection is a safe method in selected breast cancer patients with

sentinel node non-visualization on lymphoscintigraphy images. Selection of patients who really benefit from re-injection needs further large multicenter studies.

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