

## Plurifocal breast cancer and double lymphatic spread

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**SUMMARY: Plurifocal breast cancer and double lymphatic spread.**

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*Background. Sentinel node (SN) has been proved to be a reliable technique in predicting the lymphnodal state of the axilla in breast cancer. For the majority of the authors the intradermal and peritumoral injection is the best way.*

*Patients and Methods. Our experience, from 1997, includes 587 cases of SN in women with resectable breast cancer less than 3 cm of diameter. We performed the lymphoscintigraphy after a peritumoral injection of radioactive tracer and, if the lesion was superficial, we associated an intradermal injection on the skin above the lesion itself. Two patients had plurifocal right breast cancer. We did two separate injections around each tumor.*

*Results. The radioactive tracer spread towards the internal mammary chain and omolateral axillary nodes.*

*Conclusions. We consider the peritumoral injection as essential in tumors located deeply in the breast (under ultrasound guide if not palpable) together with intradermal injection in superficial ones. Using this technique the possibility of a misidentification of the SN is reduced.*

**RIASSUNTO: Tumore della mammella plurifocale e doppia diffusione linfonodale.**

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*Obiettivo. La biopsia del linfonodo sentinella rappresenta una efficace tecnica nella valutazione delle condizioni linfonodali ascellari nel cancro della mammella. Secondo la letteratura sono più utili l'iniezione intradermica e quella peritumorale.*

*Pazienti e metodi. La nostra esperienza, dal 1997 ad oggi, riguarda 587 casi di biopsia del linfonodo sentinella in pazienti con tumore della mammella inferiore a 3 cm. Abbiamo eseguito una linfoscintigrafia dopo l'iniezione peritumorale e, se la lesione era superficiale, veniva associata un'iniezione intradermica sulla cute sovrastante la lesione. In 2 pazienti il tumore era plurifocale a destra. Abbiamo praticato in questi casi due iniezioni separate.*

*Risultati. Il tracciante radioattivo si dirigeva verso la catena linfonodale mammaria interna e verso quella ascellare omolaterale.*

*Conclusioni. Riteniamo l'iniezione peritumorale del tracciante indispensabile in quei tumori localizzati profondamente nella mammella (sotto guida ecografica se non palpabili) associando una iniezione intradermica in quelli superficiali. Con questa metodica si riduce la possibilità di errore nella identificazione del linfonodo sentinella.*

KEY WORDS: Breast cancer - Sentinel node - Lymphoscintigraphy.  
Cancro della mammella - Linfonodo sentinella - Linfoscintigrafia.

## Introduction

The prognostic value of lymph node status has been partly reappraised since the initial directions of Halsted's theory on the need for radical control of breast cancer at the loco-regional level and Fisher and

Helmann's theories on reducing radical surgery to the Consensus of St. Gallen on the role of other factors, such as patient age, tumor diameter, presence of hormonal receptors, grading, tumoral growth, oncogenes. Many studies (1-4) have underlined the scarce therapeutic importance of axillary lymphectomy other than for staging, since it is burdened by a wide range of complications and sequelae (20-73%) such as chronic lymphedema, paresthesia, decreased mobility, psychological stress (5-7).

One way devised to reduce the entity of these complications (seroma, limb edema) and a less radical technique than of axillary dissection, was lymph node

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sampling (8) but this method was found to produce a high rate (24-42%) of false negatives, presumably because of incorrect mapping of lymphatic drainage or the number of lymph nodes removed too small. Subsequently, axillary lymphectomy is generally reserved to levels 1 and 2 in T1 a-b (9-10), keeping in mind that in T 1 the rate of axillary metastasis is < 12% (11-12).

Preoperative diagnostic imaging (ultrasonography, TC, MR, scintimammography) (13, 14) has not improved detection rates of axillary lymph node status and lymphonodal echo-guided fine needle aspiration cytology is burdened by elevated false negative rates (40%). PET has shown a good diagnostic sensitivity (90%) with a negative predictive value of around 93% (15, 16).

Drawing on these considerations sentinel node (SN) biopsy appears attractive; SN biopsy requires a multidisciplinary approach (nuclear physician, surgeon, pathologist) and informed consensus from patients. The SN is detected using vital stain (detection rate from 66% to 98%) (17) or with radioactive tracer (detection rate from 82% to 98%) (18). Predictive value of SN biopsy is between 95% and 100% (19) with false negative between 0% and 15% and the number of SN between 1 and 7 (20). The greater part of the authors consider the intradermal and/or peritumoral injection as the best way (21) but recently the intrareolar injection has been proposed. This theory is based on the hypothesis that the mammary gland and its skin constitute an anatomo-functional unit whose first lymphonodal drainage (SN) is situated in the lower part of the axilla.

Our experience, from December 1997 to December 2007, includes 587 cases of SN biopsy in women with respectable breast cancer less than 3 cm of diameter. We performed the lymphoscintigraphy after a peritumoral injection of radioactive tracer and, if the lesion was superficial, we associated an intradermal injection on the skin above the lesion itself; if the tumor was small, not palpable or situated deep in the breast, we did the injection under ultrasound guide. Using this technique we have correctly identified the SN with the lymphoscintigraphy in 97,7% of cases with 5,8% of false negative.

## **Patients and methods**

### *Case n. 1*

A 57 years old woman with a plurifocal right breast cancer: one lesion (1,3 cm) was situated under the areola and the other one (2 cm) in the middle of inferior quadrants. According to the mammography both lesions appeared as infiltrating; cytology was positive for malignant cells in both. In order to verify whether the two lesions drained to a single SN, we did two separate injections,

in different hours, around each tumor. We used 10 to 40 nm human albumin particles (Nanocoll) marked with 20-40 MBq for a total amount always less than 1 ml. We started injecting on the medial edges of the inferior quadrants tumor. Scintigraphic images were taken contextually to the injection. The patient was placed in supine position with the arm in the same position as during the operation. The peak of emission of Tc<sup>99m</sup> was used to acquire the images, which clearly showed how the tracer quickly and exclusively spread from the centre of the injection medially towards two nodes of the internal mammary chain. After waiting 15 minutes, in order to show eventual late disseminations to other nodes, we injected a second dose around the retroareolar tumor: the tracer headed to an omolateral axillary node. During the operation we correctly identified the SN of the axilla. We did not remove the internal mammary chain lymphonode, as we feel that such a route is only an indication to adjuvant radiotherapy of the region.

### *Case n. 2*

A 43 years old woman suffered from a plurifocal right breast cancer: one lesion (1,2 cm) was situated in the internal inferior quadrant and the other one (1 cm) in the upper external quadrant. Mammography and cytology were positive for malignant cells in both lesions. Scintigraphic images with the same technique of the first case showed a spread towards one node of the internal mammary chain and one node of omolateral axillary chain. During the operation we correctly identified the SN of the axilla and did not remove the internal mammary chain.

## **Discussion**

Radiotracer injection may be problematic because of differences in formulation. Some authors prefer intradermal or peritumoral injection or both, while others (22) showed higher detection rates (65%) of the SN in the internal mammary chain of lymph nodes with deep retrotumoral injection in tumors spreading to the medial quadrants. Some authors (23) who consider a single lymphatic drainage for all quadrants of the breast reported their preference for retroareolar injection. Other authors (24) prefer periareolar injection, especially in nonpalpable lesions or of the upper external quadrant in order to reduce high residual background during intraoperative detection with probe. Yet other authors prefer intratumoral injection (25).

About the role of the SN in the internal mammary chain some studies (26) have reported very low rates of metastatic SN (8-16,7%) which, considering other factors conditioning adjuvant chemotherapy, probably do not justify surgical ablation of the SN of the internal mammary lymph chain.

## **Conclusions**

Even though rare (27), this experience led us to the conviction that the identification of the SN cannot be simplified with the subareolar injection. With this

technique the identification of a SN is in fact possible but, in our experience, the node found does not necessarily drain the tumor area. We consider the peritumoral injection as indispensable in those tumors located deeply in the breast (under ultrasound guide if not palpable), associating it to the intradermal injection in superficial ones. Using this combined technique, the

possibility of a misidentification of the SN is reduced.

It is however necessary to study more women with tumors not localized in the central area of the breast, with an informed consent, a double tracer injection (peritumoral and subareolar) in order to verify the singleness of the drainage and therefore simplify the SN identification technique.

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