

while ensuring rigorous oncological safeness and low morbidity rate. Here is reported our 1 year experience.

**Materials and Methods:** *Patients' selection:* Minimally invasive approach was prospectively offered to women candidate to nipple sparing mastectomy, both for breast cancer (BC) and risk reduction surgery (RRS).

*Surgical technique:* A 3–4 cm skin incision in axilla was used for all surgical procedures. Firstly, sentinel lymph node biopsy and/or axillary dissection were performed if indicated and breast tail was prepared under direct vision. Then the whole mammary gland was dissected under endoscopic assistance using ultrasonic or radiofrequency scalpel. The superficial skin flap was created through 2 different techniques: (a) Gasless technique: a retractor with the endoscope inside pulled up the skin; (b) Breast endoscopic single site (BESS) technique: the working space was created by a single-port device with injection of CO<sub>2</sub>. The nipple-areola complex was accurately hydrodissected and cored with cold scissors and the retroareolar tissue marked for pathologic exam. Dissection of the breast gland from the deep fascial plane allowed to complete the mastectomy and to extract the gland from the axillary scar. Immediate reconstruction was performed by video-assisted subpectoral pocket creation and trans-axillary positioning of an anatomical permanent prosthesis.

**Results:** At the Breast Unit of Fondazione IRCCS Policlinico San Matteo in Pavia, Italy, from October 2010 to October 2011, 26 patients (45.6±7.3 years) underwent 30 V-NSM. Indications were: 21 BC and 9 RRS. In oncological patients 17 sentinel lymph node biopsies and 6 full axillary dissections were performed at the same time. The new V-NSM technique was feasible in all 30 cases. No nipple-areola complex was removed either for close/positive margin or for postoperative necrosis. Reconstruction was made with medium size 243±58 cc implants obtaining excellent/good symmetry. No early major complications developed.

**Conclusions:** Minimally invasive V-NSM is feasible and promises to become a good option in selected patients, if surgical and oncological safeness of this series will be confirmed by more extensive experience and appropriate follow-up.

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#### Neither Ductal Nor Lobular Invasive Breast Cancer and Sentinel Node

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Sentinel node biopsy is the gold standard technique for staging the axilla in early stage breast carcinoma.

Invasive breast cancer with special histological features comprises around 10% all breast cancers detected, and comprises a heterogeneous group of breast malignancies, with different prognosis and outcome.

The purpose of this study was to examine the accuracy and feasibility of sentinel node biopsy according these unusual subtypes of breast carcinoma.

**Methods:** From January 1997 to July 2008 all patients in 6 affiliated hospitals having early breast cancer, and clinically negative axilla, underwent sentinel node biopsy (SLNB) (n=2253). Patient data were entered in the multicenter data base.

For lymphatic mapping, all patient received an intraleisional dose of nanocolloid Tc<sup>99m</sup> (dose: 4mCi in 0.4 ml. saline), at least two hours before surgical procedure, by the same Nuclear team.

**Results:** For the whole series, detection rate was 95% (no migration in 123 patients), and positive sentinel node prevalence was of 22%.

Of 2253 patients in our data base, pathology reported in 144 cases, neither lobular nor ductal carcinoma, this is a 15.64% of the whole series.

Migration of nanocolloid was unsuccessful in 8 patients, so diagnosis accuracy rate has been of 94.5%.

Positive sentinel node prevalence was 7.3%.

	N	No migration	SN +	CAD+/CAD
Invasive apocrine	2 (1.4%)	0	0	–
Adenoid cystic	5 (3.5%)	0	0	–
Colloid	34 (14%)	4 (2.7%)	3 (8.8%)	3/7
Medullary	20 (13.9%)	1 (1.4%)	1 (5%)	1/2
Invasive Micropapillary	5 (3.5%)	0	1 (20%)	1/1
Papillary	19 (13.2%)	0	0	–
Cribiform	8 (5.6%)	0	1 (12.5%)	1/1
Tubular	41 (28.5%)	2 (1.4%)	4 (9.7%)	4/6
Neuroendocrine	5 (3.5%)	0	0	–
Metaplastic	5 (3.5%)	1 (1.4%)	0	0/1
TOTAL	144	8 (5.5%)	10 (7.35%)	

All patients with positive sentinel node (metastasis or micrometastasis) or no migration during the lymphoscintigraphy underwent complete axillary dissection (CAD).

**Conclusions:** Sentinel node biopsy is also accurate and feasible in special histological subtypes of breast carcinoma.

Diagnosis efficacy and positive sentinel node prevalence in these tumours is not distinctive from ductal either lobular breast carcinoma.

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#### Long-term Results of Breast Conservation Treatment Without Axillary Lymph Node Dissection for Clinical T1/2N0M0 Breast Cancer – Comparison with Breast Conservation Treatment with Axillary Lymph Node Dissection

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**Background:** The number of pathological metastases of axillary lymph node (ALN) dissected during surgery is the most reliable prognostic factor, and the key indicator in determining the indication of the post surgical treatment. However, complications such as seroma, elevation disturbance, paresthesia, and edema of the upper arm are associated with a high incidence of axillary lymph node dissection (ALND). The aim of this study is to examine the effectiveness of breast conservation treatment (BCT) without ALND for clinical T1/T2N0M0 breast cancer.

**Materials and Methods:** We enrolled 212 breast cancer patients diagnosed clinically T1/T2N0M0 between July 1989 and January 2004. Patient age ranged from 21 to 84 years (median 49). Follow-up phase is from 1 year 6 months to 22 years 0 months (median 14 years 3 months). We provided BCT without ALND for 106 patients who agreed to receive this treatment and BCT with ALND for others. Criteria of negative ALN metastasis were that minor axis of lymph node was less than 5 mm on CT images and fat tissue in the hilum of ALN did not disappear on ultrasound images. In the case that hormone receptor expression was positive or unknown, nonsteroidal antiestrogen was administered for 5 years. In the case of T1c or T2 under 70 years old, neoadjuvant and/or adjuvant anthracycline-based chemotherapies were administered. After surgery, patients without ALND received tangential irradiation at the region of both breast and axilla, and patients with ALND received only at the region of breast.

**Results:** Ninety-one patients were pathological negative ALN metastasis among 106 patients who were performed surgery with ALND (true-negative rate was 85.8%). However, there were no patients with more than 4 ALNs metastases among them. Ten years overall survival was 95.5% and 96.9% in the case of BCT without ALND and with ALND, respectively, and there was no significant difference between two cases. Ten years disease-specific overall survival was 97.7% and 98.0% in the case of BCT without ALND and with ALND, respectively, and there was also no significant difference between two cases. Ten years disease free survival was 90.4% and 89.4% in the case of BCT without ALND and with ALND, respectively, and there was also no significant difference between two cases.

**Conclusions:** These results indicate that ALND is omissible in the case of BCT for clinical T1/T2N0M0 breast cancer by a combination of hormone therapy, neoadjuvant/adjuvant chemotherapy, and irradiation.

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#### Intraoperative Injection of Subareolar Radioisotope Results in Predictable Identification of Sentinel Lymph Nodes in Breast Cancer

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**Objective:** Our objective is to evaluate intra operative subareolar injection of technetium-99m (Tc99), after induction of anaesthesia, is safe, effective and pain free for identification of sentinel lymph node in breast cancer patients.

**Background:** Preoperative injection of Tc99 is routinely performed before sentinel lymph node biopsy (SLNB) for breast cancer. Blue dye is often used to help guide and confirm the localization. This method is limited because of painful injections and we hypothesized that giving the radioisotope after the induction of anaesthesia is practical for the identification of sentinel lymph node in breast cancer and avoid the significant impact of pain. Current standard of practice is to inject the radioisotope prior to the anaesthetic.

**Methods:** This is a single institution study. All patients with operable breast cancer that were eligible for a SLNB radioisotope injection after the induction of anaesthesia from November 2011 were included. After induction and before sterile preparation of the operative field 0.2 ml of Tc-99 was administered by a subareolar injection. Site and type of injection, injection time, incision time, and identification time of sentinel node along with other factors for the purposes of the study were recorded. Data comparing injection of Tc-99 preoperative and intraoperative are being analysed.

**Results:** Thus far 8 patients have had this procedure done and we aim to include another 30 by the end of February. The sentinel node was localized in 100% of patients. The site of injection was subareolar in all the 8 patients. Average time from injection to incision was about 20.10 minutes. The average time for the identification of the sentinel node from the incision was 14.08 minutes. The average ex-vivo count was 8920.00. These results have shown no significant differences to the results from the pre-operative injection of radioisotope prior to the anaesthetic.

**Conclusion:** Intraoperative subareolar injection of Tc99 after induction of anaesthesia is a safe effective and pain free technique for identification of sentinel lymph node in breast cancer patients.

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### The Role of Sentinel Node (SLN) Procedure After Neo-adjuvant Chemotherapy (NACT) for Node Positive Breast Cancer (NPBC)

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**Background:** The use of SLN procedure is the standard of care in early breast cancer. The management of NPBC after NACT is currently under investigation. We studied the feasibility of a SLN procedure in NPBC patients (pts) after NACT in order to prevent axillary lymph node dissection (ALND) in pts with a major clinical response (T<2 cm).

**Material and Methods:** The primary end points are the sensitivity, specificity, negative predictive value (NPV), positive predictive value (PPV) and accuracy of the SLN procedure. Tumor stages T2 (≥3 cm)-T4, N1-3 were included. Lymph node involvement was proven by core biopsy. After diagnosis of NPBC, all pts were given the same NACT with or without trastuzumab. Lumpectomy (LE) or mastectomy (ME) was performed within 3 to 5 weeks after the last NACT and within 30 minutes to 10 hours after injection of tracer periareolar (148mBq 99m Tc Colloid albumin, planar scintigraphy, NanoColl®). This was followed by a SLN procedure and a level I & II ALND.

**Results:** Sixty-nine pts with invasive NPBC were included between 2008 and 2011. Eleven of them are still receiving NACT. In 3 pts the SLN was not found. In 11 other pts the SLN procedure was not performed, 2 of them had progressive disease (PD). Eventually 44 pts of the included pts received a SLN procedure. The median age is 47 (range 27-74) years; 86.4% (38/44 95% CI 0.73-0.95) of the pts had a major response; 9.1% (4/44 95% CI 0.03-0.22) stable disease and 4.5% (2/44 95% CI 0.01-0.15) had PD. Nine pts underwent LE and 35 pts underwent ME. The positive SLN rate was 50% (22/44 95% CI 0.35-0.65). Prevalence of a positive ALN was 12 out of 22, with a PPV of 54.5% (12/22 95% CI 0.32-0.76). In 17 pts with a negative SLN there were no metastases found in the ALN, unfortunately in 5 pts with a negative SLN there were metastases found in the ALN. The NPV is 77.2% (17/22 95% CI 0.55-0.92). The sensitivity and specificity of SLN were 70.5% (12/17 95% CI 0.44-0.90) and 63.0% (17/27 95% CI 0.42-0.81), respectively. In a subgroup of pts (n=29) with a major clinical response after NACT similar results were found.

**Conclusions:** SLN after NACT is feasible in patients with a major response in NPBC. This study warrants a randomized phase III trial with or without ALND in a sentinel node negative population with a major response (cT <1 cm) for measuring axillary recurrence and overall survival.

SLN	ALN						Total		
	+			-					
	All	cT <2 cm	cT <1 cm	All	cT <2 cm	cT <1 cm	All	cT <2 cm	cT <1 cm
+	12	7	2	10	5	1	22	12	3
-	5	4	1	17	13	7	22	17	8
Total	17	11	3	27	18	8	44	29	11

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### Localisation Failures with Radio-guided Occult Lesion Localisation; Pitfalls and Solutions

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**Background:** Radio-guided occult lesions localisation (ROLL) of non palpable breast carcinoma uses the radiotracer which is injected intra-tumourally for sentinel lymph node identification for detection of the primary tumour during surgery. In the context of large multi center trial 162 patients underwent ROLL and 5 cases of mislocalisation of the carcinoma (i.e. defined as <25% of the lesion enclosed in the surgical specimen) were encountered. In a multidisciplinary setting, we evaluated reasons for failure of these ROLL procedures.

**Methods:** Women with non-palpable breast cancer and eligible for breast conserving treatment with sentinel node procedure received an intra-tumoural dose of 120 Mbq Technetium<sup>99</sup> nanocolloid. Injection was done by the radiologist, with ultrasound or mammographic guidance. Guided by a gamma detection probe, the surgeon excised the primary tumour and the sentinel node(s). Patient, imaging and tumour characteristics were prospectively collected. For the 5 cases in which failure of localisation occurred, imaging features, surgical reports and histological slides were scrutinized by a radiologist, surgeon and pathologist to elucidate the reasons of failure.

**Results:** Out of the 162 ROLL procedures, mislocalisation occurred in five (3%) patients. Four failures were ascribed to incorrect pre-operative localisation of the tumour for technetium injection. In 1 case, dispersion of the technetium was identified as the cause of incorrect localisation. Patient, imaging or histological characteristics did not explain the failures. All patients underwent reoperation.

**Conclusion:** Inadequate excision of breast cancer due to failure of the localisation procedure is a rare, but serious complication of the ROLL procedure, which should be prevented at any time. Future incorrect localisations may be avoided by using contrast medium mixed with the radiotracer for injection, allowing mammographic verification of the correct placement of the radioactive tracer.

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### The Effect of Radiotherapy On Axillary Recurrence After Negative Sentinel Lymph Node Biopsy

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**Background:** The aim of our study is to evaluate the effect of radiotherapy on axillary recurrence in patients with negative sentinel lymph node biopsy.

**Material and Methods:** The database of the European Institute of Oncology was retrospectively reviewed. Between 1996 and 2005, 4,000 patients operated for breast cancer had negative sentinel lymph node and no further axillary dissection. They were divided into four groups according to the type of surgery and radiotherapy received: group I included patients with breast conservation and external beam radiotherapy (BCS+EBRT, n = 2798), group II included patients with breast conservation and intraoperative partial breast irradiation (ELIOT full dose) (BCS+IORT, n = 766), group III included patients with breast conservation, intraoperative partial breast irradiation (ELIOT boost) and external beam radiotherapy (BCS+IORT+EBRT, n = 60), and group IV included patients with mastectomy and no radiotherapy (MT, n = 333).

**Results:** Fifty one out of 4,000 patients with negative SLNB (1.2%) presented ipsilateral axillary recurrence, after a median follow up of 86 months (range 4-76). Axillary metastasis was detected in 25 patients out of 2798 (0.89%) in group I (BCS+EBRT), 11 patients out of 766 (1.4%) in group II (BCS+IORT), one patient out of 60 (1.6%) in group III (BCS+IORT+EBRT) and 14 patients out of 333 (4.2%) in group IV (MT). Univariate and multivariate analyses are in process.

**Conclusion:** As the statistical analysis is still ongoing, definite conclusions can not be drawn at the moment. Completion of data evaluation is expected by the end of 2011.