Materials and Methods: Between 2003 and 2008, 200 patients with Stage II and III breast cancer previously treated with PST were enrolled in this study. The eligible criteria for PST were (a) primary tumor >3 cm or (b) positive axillary lymph node status on initial examination. FNA biopsy was performed for clinically or ultrasonographically suspicious axillary lymph nodes. The patients then underwent SLNB, which involved a combination of intradermal injection over the tumor of radiocolloid and subareolar injection of blue dye. This was followed by Level I/II axillary lymph node dissection (ALND).

Results: The median patient age was 49 years, and the median primary tumor size was 4.9 cm. The overall SLN identification rate was 94.5% (189 of 200). In 178/189patients (94%) the SLN accurately predicted the axillary status. Eleven patients had a false-negative SLN biopsies, yielding a false-negative rate of 12.9%. There were no significant differences in the SLN identification rate according to tumor classifications before PST, the clinical nodal status before PST, the clinical tumor response after PST, or pathological response of the tumor after PST, although the SLN identification rate tended to be lower in patients with a T4 primary tumor.

Conclusions: Our data suggested that SLNB was feasible method for axillary staging in breast cancer patients who received PST even in patients who initially with lymph node positive disease. However, false-negative rate of SLNB in patients with clinical and pathological complete tumor response tended to be higher than other group.

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The impact of the Sentinel Node concept on overall survival, disease-free survival and axillary recurrence of breast cancer patients

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Introduction and Aims: The Sentinel Node (SN) concept emerged as a way to improve Breast Cancer (BC) staging and to reduce the morbidity of the Axillary Dissection (AD). But the influence of the SN concept on long term BC outcomes is not well defined. The aim of this work is to assess the impact of the SN concept on the overall and disease-free survival and on the axillary recurrence, in a prospectively controlled series of BC patients.

Methods: This revision includes 394 consecutive BC patients, from two successive randomized clinical protocols. The first (n = 166) elapsed from April 2001 to June 2003 and the second (n = 228) accrued from September 2003 to January 2005. The first study included patients with tumours less than 30 mm and the pN0sn patients were randomized between AD and SN only. The second study was divided into two groups. Group A received uT1 patients; pN0sn patients were spared from the AD and pN+sn patients were submitted to AD. Group B received uT2 patients; those with pN0sn were randomized between AD and SN only. Patients were followed-up at the out-patient breast clinic, every 3 months during the first 3 years, every 6 months until 5 five years and then yearly. Events were prospectively registered in an Institutional database.

Results: Median patient's age was 55 years (range: 20−78). Median follow-up time was 66 months (range: 4−100). Two men were included. Mean overall survival time for SN only patients was 98 months and for the AD patients was 93 months (p = 0.003). Mean relapse-free survival time for the SN only patients was 97 months and for the AD patients was 99 months (p = 0.43). At five years of follow-up, overall survival was 98% for the SN only group and 92% for the AD group and disease-free survival was 99% for the SN only group and 100% for the AD group. There were not detected axillary nodal recurrences among SN only patients or between AD patients.

Conclusions: Long-term follow-up of BC patients submitted to SN biopsy-only showed similar results to AD submitted patients, in terms of overall survival, disease-free survival and axillary node recurrence, therefore ensuring clinical perdurable adequacy of the SN concept.

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Micrometastasis and isolated tumour cells in the sentinel lymph node after neoadjuvant treatment in breast cancer patients may reflect residual disease in non sentinel nodes

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Background: Recommendations about performing a complete axillary node dissection in sentinel node (SLN) with micrometastasis and isolated tumor cells in early stage breast cancer have been controversial. While SLN biopsy is considered an accurate method for staging the axilla in patients with breast cancer before systemic treatment, the use of SLN after neoadjuvant treatment (NAT) is less well established. The aim of this prospective study is to determine the accuracy of SLN technique after NAT and the significance of micrometastasis and isolated tumor cells in the SLN in this group of patients.

Material and Methods: From June 2005 to June 2009, a total of 71 patients with T1−3 N0−1 breast cancer who underwent NAT (chemotherapy or hormonetherapy) were included in the study. After NAT, patients with a clinically negative axilla underwent sentinel node biopsy and full axillary dissection. All patients were injected subareolar with Tc-99 the day before of surgery. The SLN was identified by the gamma probe, and sent to Pathology for frozen (FS) and H&E paraffin-sections. If the SLN was negative by H&E paraffin-sections, then immunohistochemistry was performed.

Results: The SLN identification rate was 95.8%. Mean number of sentinel nodes removed were 2.2 (range, 1−7). Twenty three (32.3%) patients had a positive axilla. The sentinel node was positive in 22 patients, with a false negative rate of 4.3%. Three patients had isolated tumor cells in the sentinel node, 2 of this (66%) had additional positive non sentinel nodes. Four patients had micrometastasis to the sentinel node, 3 of this (75%) had additional positive non sentinel nodes. The sentinel node was the only positive node in 7 patients (32%). Pathologic complete response was achieved in 30% of patients.

Conclusion: Patients with NAT can benefit from sentinel node biopsy as an accurate technique and may be spared axillary node dissection and its associated morbidity. The significance of micrometastasis or isolated tumor cells to the sentinel node in NAT patients may reflect residual tumor in the axilla and these patients should have a completion axillary node dissection as 70% of patients will have additional positive non sentinel nodes.

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Value of sentinel lymph node identification in high risk ductal carcinoma in situ

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Background: Although sentinel lymph node (SLN) identification have a definite role in breast cancer staging it has not yet been totally accepted for patients with ductal carcinoma in situ (DCIS) of the breast.

Aim: To evaluate the applicability and results of SLN technique in high risk DCIS patients.

Method: We studied 200 patients with preoperative diagnosis of high risk DCIS from two tertiary hospitals. The day before surgery a lymphoscintigraphy was performed by using 111 MBq of 99mTc-nanocolloid in 1 intratumoral, peritumoral or subdermal injection way based on every case. Intraoperative detection of the SLN was performed by using a hand-held gammaprobe. In 100 cases vital blue dye was used.

Results: One hundred and thirty six patients showed a pure DCIS, 45 an invasive carcinoma and the remaining 19 had microinvasion in definitive histology. Lymphoscintigraphy and radioguided surgery identified SLNs in 98% (197/200) of patients. The vital dye injection identified SLNs in 77% of patients.

Thirteen patients showed metastatic SLN (10 micrometastases and 3 macrometastases). Eight of them in the group with invasive carcinoma (i.e. metastatic rate 19%). The remaining five presented two micrometastasis

and a macrometastasis in the group with microinvasive carcinoma (metastatic rate 16%) and two micrometastases in pure DCIS group (metastatic rate 1.4%).

Conclusion: Lymphoscintigraphy is a relatively simple and useful technique to identify the SLN. This method shows a high SLN identification and deserves a special consideration in order to better staging the high-risk group of patients with DCIS.

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Predicting non-sentinel-nodes status in patients with metastatic sentinel node: which nomogram?

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Background: About 35% to 50% of patients with metastatic disease in the Sentinel Lymph Node (SLN) has additional nodal metastases detected at the Completion Axillary Limph Nodes Dissection (CALND). To identify the individual patient's risk for non-SLN metastases nine statistical methods were described in the recent literature: one from the Breast Service of Memorial Sloan-Kettering Cancer Center (MSKCC), one from Tenon Hospital (France), one from Cambridge (UK), one from Stanford (USA), the Saidi score, the Mayo nomogram and the MDA score (USA), and finally two tools described by Kohrt et al. The outcome of these tools is the predicted probability of Non-SLNs metastasis in positive SLN Biopsy. The aim of this study was to confirm the MSKCC nomogram predititive accuracy in a population of breast cancer patients from Italy, to compare the result with three other tools, the Tenon nomogram, the Stanford and the Cambridge tools and finally, on the base of these results, to review the literature to identify the ideal one. In perspective, the final goal is to avoid CALND in Positive SLN patients with low risk of metastatic Non-SLNs.

Methods: We enrolled in the study 490 consecutive primary breast cancer patients T1/T2 undergone SLNB from October 2004 till July 2009. 130 of these (26%) showed SLN metastasis at Frozen Section (FS) or at the definitive histological examination (40% micro- and 60% macrometastasis). 120 patients, underwent CALND, immediately when SLN positive at the FS, or delayed (about two weeks) in case of False Negative FS. The likelihood of additional nodal metastasis was calculated by the MSKCC tool, the Tenon score, the Stanford and the Cambridge tools and than compared this 'a priori' result with the real non-SLN status using the area under the receiver operating characteristic (ROC) curve. Values greater than 0.70 were considered indicators of good discrimination.

Results: The mean Axillary Lymph Nodes number was 21. 43 of 120 patients (36%) had non-SLN metastasis (10% of the SLN micrometastasis and 57% of the SLN macrometastasis). The area under the curve values were a bit over the threshold of 0.70 for all the four models, but, on the subset of micrometastatic SLNs, all the tools demonstrated themselves inadequate (<0.50).

Conclusions: Despite other works, in our breast cancer population, all the four analysed models showed themselves accurate for predicting nonSLN metastasis. The reported differences may depend on the large variability of the samples about some involved variables (percentage of Micrometastasis, FS performed, T status, lymphovascular invasion, SLNB technique). Micrometastasis, as yet described, represent a peculiar problem and requires caution. We confirm that these models, very accurate in the institution of origin, require a new validation if used on other populations of patients.

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The effect of intra-operative frozen section on theatre time

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Background: Over the last decade sentinel lymph node biopsy (SLNB) has gained in popularity with more centres carrying out the procedure routinely. One way of assessing lymph node status is intra-operative frozen section (FS) which avoids further axillary procedures and this is the method we have adopted. A criticism of FS has been its possible impact on operating times. The aim of this study was to assess the effect of FS on our total operating times.

Materials & Methods: Data was collected prospectively over a period of six weeks between December 2007 and January 2008. Data included type of procedure, length of operation, time taken for FS, result of the FS as well as time from results to completion of surgery. Data was analysed using Microsoft Excel 2003.

Results: 23 procedures were carried out in the study period of which 15 underwent breast conserving surgery. For this sub-group of patients the average time for FS results was 35 minutes (range 21−57) with two being

positive. Average time from results to completion of surgery was 20 minutes (range − 10−107) with the most delay noted in the two positive cases requiring axillary node clearance. The remaining 8 underwent mastectomy with immediate reconstruction thus FS had no impact.

Conclusion: Although the number of patients is small one may speculate that FS has a very small impact on operating times for those patients undergoing breast conservation surgery. FS also reduces the chances of further axillary dissection thus ultimately saving on theatre time.

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Predictive factors of negative axillary dissection after neoadjuvant chemotherapy (NAC): place of a score in decision-making regarding sentinel lymph node after NAC in patients with locally advanced breast cancer

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Background: The main purpose of NAC is to permit conservative breast treatment. In cases where response is good, this conservative approach could be widened to the axilla with sentinel lymph node biopsy (SLNB), further reducing morbidity. This retrospective study identifies the predictive factors of negative axillary dissection (AD) after NAC. These factors, balanced in a score, could be helpful for selecting patients eligible for SLNB post-NAC.

Patients and Methods: 776 patients were treated at the Institute Curie between January, 1990 and December, 1999, for a locally advanced breast cancer (T2-T3). Most of them had a fine-needle aspiration of clinically palpable lymph nodes. All patients received a NAC, followed by breast surgery with AD and radiotherapy according to our protocols. The clinico-biological factors associated with a negative AD were recorded and used in the development of a predictive score of negative AD after NAC.

Results: 461/776 patients (59.4%) had clinically negative lymph nodes before treatment and 315 patients had an axillary lymphadenopathy. After NAC, 326 patients (42%) had a negative AD (pN0). In multivariate analysis, there were three predictive factors of a negative AD: clinically negative lymph nodes before treatment (p = 0.01), lack of expression of estrogen receptors (p < 0.002), and a response of the primary tumor clinically ⩾50% (p = 0.0008) after NAC. The score we propose allows an accurate estimation of the probability of a negative AD using only preoperative data.

Conclusion: Among patients receiving NAC for locally advanced breast cancer, SLNB should be reserved for patients at low risk of metastatic axillary involvement. The development of a score using three preoperative factors available to the surgeon may be a valuable tool in support of SLNB after NAC.

Data score will be available for the EBCC.

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Axillary recurrence rate after negative sentinel lymph node biopsy for invasive breast cancer

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Background: Staging of the axilla by sentinel lymph node biopsy (SLNB) is the treatment of choice in patients with invasive breast cancer without clinical, ultrasound verified, axillary involvement. SLNB is practised in our clinic since 2005. The objective of this retrospective study was to provide data about the success and loco regional control rate of patients with breast cancer staged with SLNB who had a negative SLNB and therefore underwent no axillary lymph node dissection (ALND).

Material and Methods: A retrospective review of all breast cancer patients who underwent a SLNB between January 2005 and December 2008 was performed. Patients with proven invasive breast cancer and without signs of axillary node involvement were enrolled. Lymphatic mapping and identification was performed with subcutaneous injection above the tumour of 2 ml. Patent Blue and peritumoral injection of 99m Tc-nanocolloid. All positive SLNBs were followed by an ALND and were excluded from this study. Patients with a negative SLNB received tailor made treatment following the National Guideline Breast Cancer. Patient- and tumour characteristics were collected and analysed.

Results: 412 patients underwent a successful SLNB (91%). About three quarters (72%) of the patients had a negative SLNB. These 296 patients were followed in this study. After a median follow-up of 24.6 months axillary recurrence was found in 3 patients (1.0%). In 6 patients (2.0%) a distant recurrence, without axillary involvement, developed. In 23 patients the SLNB showed only presence of submicrometastases (<0.2 mm) and were