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.

315 Poster

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 preditictive 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.

316 Poster

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.

317 Poster

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 $\geqslant 50\%$ ($p = 0.0008$) 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.

318 Poster

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

considered as a negative outcome. None of these patients developed local recurrence during follow-up.

Conclusions: SLNB is a safe and reliable method for staging the axilla in patients with invasive breast cancer. However there is a chance of developing local recurrence (1.0%) and distant recurrence (2.0%). Long-term follow-up will prove whether these percentages will remain constant. Patients with submicrometastases in the SLNB did not develop any axillary recurrence.

319 Poster

Detection of the sentinel lymph node in breast cancer: a comparison between two radiotracer injection techniques: periareolar and intratumoral

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Background: It is believed that preoperative detection of the sentinel node (SN), through periareolar cutaneous injection, presents advantages over other techniques. However, few data have been published comparing the different ways of administration. The aim of this study is to compare the periareolar (PA) vs. Intratumoral (ITU) methods of radiotracer for detection of SN.

Material and Methods: Twenty-three women with breast-cancer (T1-T2) were investigated. Chemotherapy, non-oncological breast surgery and previous axillar surgery, pregnancy, palpable axillary lymph node and inflammatory breast cancer were excluded. All patients were submitted to both methods. Firstly, the radiotracer was injected into the tumor guided by a radiological study. Scintigraphic images were acquired with a Gamma camera filled with a high-resolution collimator in order to document the number, place of migration and uptake in the SN. Acquisitions were done with patient's arms in the surgical position. After radiotracer injection, dynamic and static images were obtained at 1 and 3 hours, respectively, in anterior and lateral views. After conclusion of first stage, the patient received another intradermic and periareolar injection of the radio tracer, in the same quadrant of the primary lesion. Scintigraphic images was the second technique were obtained in the same manner. Fisher's exact test was used for statistical analysis, considering significant a $P < 0.05$.

Results: In the PA technique, 22/23 (95.6%) cases were identified, while in the ITU 20/23 (86.9%). Nineteen patients presented the same number and localization of the SN, with the two injection techniques. Three presented migration only with periareolar injection (axillary), and one presented a migration only with intratumoral injection at the internal mammary SN ($P = 0.6$). The rate of lymph node metastasis was 20%, all detected through both techniques.

Conclusion: There is no difference between PA and ITU technique to identify SN in breast cancer.

320 Poster

One Step Nucleic Acid Amplification (OSNA) as an intra-operative diagnostic tool for the assessment of the sentinel lymph node status in breast cancer patients

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Background: The detection of sentinel lymph node (SLN) metastases in breast cancer patients is conventionally determined by intra-operative histopathological examination of frozen sections or touch imprints. However, due to a poor sensitivity of these techniques, postoperative identification of metastases on paraffin embedded sections can lead to second surgery axillary lymph node dissection. A more efficient molecular assay called One Step Nucleic Acid Amplification (OSNA) for intra-operative identification of metastatic disease in SLN has been evaluated in several clinical studies. We present here the results from the intra-operative use of OSNA within the operating theatre.

Material and Methods: OSNA includes a short sample preparation step followed by automated measurement of cytokeratin 19 mRNA copy number directly from the homogenate and can be carried out by every laboratory technician after a brief familiarisation phase.

Before homogenisation of the whole node a 1 mm middle slice was reserved for histology. 257 SLN from 110 breast cancer patients were investigated. If OSNA was negative then Haematoxylin & Eosin (H&E) staining was performed every 200 μm; in case OSNA was positive, only one H&E section was made.

Results: Fourteen patients were positive and 81 were negative with both methods. In 4 patients OSNA indicated the presence of a macrometastasis and in 9 patients a micrometastasis whereas histology was negative, a result which was rather expected as about 90% of the tissue was referred to OSNA. The positivity rate obtained by OSNA was 24.5%. In one patient a micrometastasis was found in the 1 mm middle slice and OSNA was negative. One SLN was histology+/OSNA-, indicating CK19 low expression on a protein and RNA level.

Conclusions: OSNA is a standardised, easy to learn procedure for intra-operative detection of SLN metastases in breast cancer patients and prevents patients from a diagnostic delay or second surgery due to a postoperatively diagnosed cancer positive SLN. Since most or all of the tissue can be analysed by OSNA, the chance of a sampling bias due to uninvestigated material is very low.

321 Poster

Usefulness of clinical exploration, ultrasound and MRI for the assessment of axillary lymph nodes status previous to the performance of sentinel node

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Background: The aim of this study was to compare sensibility and specificity of clinical exploration, ultrasound and MRI to assess the status of axillary lymph nodes, as a high detection of positive lymph nodes previous to the surgical procedure lowers the probability of a false negative sentinel node.

Materials and Methods: we retrospectively reviewed T1 and T2 breast cancers not candidate for neoadjuvant chemotherapy, treated in our breast cancer unit from September 2008 to September 2009. Data on clinical exploration (CE), axillary ultrasound (AU) and MRI were reviewed for each patient. The pathology exam of the surgical specimen (sentinel node or lymphadenectomy) was reviewed for each patient and sensibility and specificity were calculated for each exploration method and for the three methods together. Sensibility was also calculated separately in patients with only 1 lymph node affected and in patients with more than one lymph node affected in the pathology exam of the surgical specimen.

Results: 99 patients with T1 and T2 breast cancer were included in the study. Results for CE were found in 34 patients. Sensibility for CE was 41% and specificity 100%. Data on UE were found in 88 patients: sensibility for ultrasound was 28% and specificity 87%. Data on MRI were found in 33 patients: sensibility was 50% and specificity 100%. Data on the three explorations were found in 16 patients: sensibility of the three explorations together was 57% and specificity 100%. In patients with one positive lymph node in the pathology exam of the surgical specimen, sensibility for CE was 16%, for UE was 12.5% and for MRI was 16%. Regarding patients with more than on positive lymph node, sensibility for CE was 66.6%, for UE was 55.5% and for MRI was 100%.

Conclusion: MRI is the exploration with a higher sensibility and specificity to assess the preoperative status of axillary lymph nodes. Sensibility increases using CE, AU and MRI all together. Infiltrated lymph nodes are better detected when more than one node is affected. A careful clinical examination is of great value to assess axillary nodes status, as sensibility and specificity could be even higher than an ultrasound exam.

322 Poster

Intra operative sentinel node metastasis detection in breast cancer by one step nucleic acid amplification: Rennes Cancer Institute experience

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Background: Sentinel lymph node (SLN) biopsy is widely used as a staging procedure in early breast cancer. Conventional methods for intra-operative assessment have a low sensitivity and lead to second surgeries when the SLN is metastatic during post-operative histology. The One-Step Nucleic Acid Amplification OSNA® method was validated to detect metastases ($\geqslant 0.2$ mm) by amplification of CK19 mRNA on SLN lysates. We report the experience of our institution since we implemented OSNA® for intra-operative clinical use.

Methods: From each fresh SLN, a central slide of 1 mm was investigated by first intra-operative touch imprint examination followed by permanent histology. The other 2 parts of the node were completely analysed by OSNA. The analysis is performed on SLN lysates on pure sample preparation and on a diluted sample (1/10). CK19 mRNA copy numbers per