

Patients and Methods: Between June 1999 and May 2008, 1417 patients with cT1/2N0 breast cancer underwent a SLN biopsy (SLNB) as a staging procedure. Primary tumour characteristics and proportional metastatic involvement of regional lymph nodes (TNM-class pN0i+, pN1mi, and pN1-3) were collected prospectively.

Results: In our study population a linear relation between tumour size and the occurrence of regional lymph node metastases was observed: primary tumours ≤ 1 cm 18.7%, 1–2 cm 35.8%, 2–3 cm 50.8%, and >3 cm 68.1% ($p < 0.001$). The relation between macrometastases and tumour size was similar (6.4%, 21.6%, 31.8%, and 54.1% respectively) while the proportion of patients with pN0i+ and pN1mi was constant (12.1%, 14.1%, 19.0%, 14.2%) (Table 1).

Conclusion: The constant frequency of small metastases (N0(i+) and Nmi) with increasing tumour size suggests that metastasizing is a constant process in the course of time. According to the results presented in this study micrometastases are a prelude to macrometastases and can not be seen as a different phenomenon.

Table 1. Tumour diameter compared to different N-stages

Tumour diameter	N0	N0(i+)	Nmi	Nmacro
<1 cm	80.6	3.2	8.9	6.4
1–2 cm	64.2	5.0	9.1	21.6
2–3 cm	49.2	3.8	15.2	31.8
≥ 3 cm	31.9	1.8	12.4	54.1

Values shown are percentages; N0: no regional lymph node metastasis; N0(i+): clusters of tumour cells in regional lymph nodes <0.2 mm; N1mi: metastasis in axillary lymph nodes with a size between 0.2 mm and 2 mm; Nmacro: ≥ 1 axillary metastasis (at least ≥ 2 mm).

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POSTER

False positive sentinel node findings in breast cancer – a review of 473 sentinel node biopsy cases

L. Strien¹, M. Leidenius², P. Heikkilä¹. ¹HUSLAB and Helsinki University Central Hospital, Department of Pathology, Helsinki, Finland; ²Helsinki University Central Hospital, Department of Surgery, Helsinki, Finland

Background: Benign epithelial displacement has been suggested to cause false positive ITC (isolated tumour cells) findings in SNB (sentinel node biopsy). Detailed analysis have showed that some ITC cases represent cells from a papillary lesion adjacent to the primary tumour, lacking atypia present in the primary tumour cells. Our aim was to study the prevalence of and reasons for false positive ITC findings in SNB in breast cancer.

Methods: We reviewed all original frozen section – and permanent section – slides of 473 SNB-cases, consisting of 73 ITC cases and of 400 SNB-negative cases a, according to the original assessment.

Results: We found 4 false positive cases possibly representing macrophages with keratin deposit material or dendritic cells. No benign epithelial cells, foreign material nor nevus cells were detected in the 473 SNB cases. Five micrometastases and 64 ITC were found among the 69 true positive cases originally regarded as ITC. All micrometastases were cases with interpretation depending on the definition applied. Seven false negative cases, including three micrometastases and four ITC, were detected among the originally 400 SNB negative cases. No association between the ITC finding and the preoperative biopsy method of the primary tumour was detected, $p = 0.859$ Table 1.

Table 1: Association between preoperative biopsy method and the sentinel node findings

Sentinel node status	FNAC N = 231	CNB N = 209	Surgical biopsy N = 24	Biopsy method not registered N = 9
Negative, N = 397	190 (48%)	178 (45%)	20 (5%)	9 (2%)
ITC, N = 68	36 (53%)	28 (41%)	4 (6%)	0 (0%)
Micrometastasis, N = 8	5 (62%)	3 (38%)	0 (0%)	0 (0%)

ITC = isolated tumour cells, FNAC = fine needle aspiration cytology, CNB = core needle biopsy

Conclusions: No signs of benign epithelial displacement was detected in the examined ITC cases. Furthermore, ITC were not detected more frequently in patients with more invasive preoperative biopsy methods.

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POSTER

Impacts of surgical margin status in breast-conserving surgery on local recurrence

T.J. Han¹, E.K. Chie¹, S.W. Ha¹. ¹Seoul National University Hospital, Department of Radiation Oncology, Seoul, South Korea

Background: The association between a microscopic close or positive resection margin and the subsequent risk of local recurrence after conservative surgery and radiation is controversial. Using various definitions of close margins, an increased risk of local recurrence has been reported by some series, but not others.

Material and Methods: Between August 1999 and February 2004, 373 patients who were diagnosed as invasive breast carcinoma after breast-conserving surgery received adjuvant radiation therapy at Seoul National University Hospital. Among Of them, 7 were excluded due to incompleteness of radiotherapy or loss of medical records. Thus, 366 patients were analyzed retrospectively in this study. Surgical margin status were as follows; 312 negative margins, 17 close (defined as 2 mm or less) margins by DCIS, 25 close margins by invasive carcinoma, 4 positive margins by DCIS. 8 patients had positive margins by invasive carcinoma, and then 6 of them underwent further resection and achieved negative margin eventually.

Results: The median duration of follow-up was 72 months (range; 8–110 months). The 5 years local recurrence-free survival (LRFS) in patients with close or positive margin by invasive carcinoma was not significantly lower than that of patients with negative margin (92.0% vs. 95.8%, $p = 0.49$), but the 5 years ultimate local control rate after salvage treatment in patients with close or positive margin by invasive carcinoma was lower than that of patient with negative margin (92.3% vs. 98.4%). There were no statistical differences in LRFS between patients with close or positive margin by DCIS and those with negative margin. Other pathologic factors such as T stage ($p = 0.34$), N stage ($p = 0.95$), presence of DCIS component ($p = 0.29$), presence of infiltrative tumor border ($p = 0.15$), presence of endolymphatic tumor emboli ($p = 0.12$) had no significance for LRFS. Also the time interval between surgery and radiotherapy ($p = 0.22$) as well as the sequence between radiotherapy and chemotherapy ($p = 0.41$) had no significance for LRFS. However, The sequence of hormone therapy was revealed to be important; initiation of hormone therapy after completion of radiotherapy resulted in lower 5 years LRFS (80.0% vs. 93.1%, $p < 0.01$).

Conclusions: According to this study, patients with close or positive margin by carcinoma in situ had experienced no failure. And with adjuvant radiotherapy, close or positive margin by invasive carcinoma did not raise the risk of local recurrence significantly, but lowered ultimate local control rate compared with negative margin. Delayed hormone therapy was a prognostic factor to increased local recurrence-free survival. Because of the low incidence of local recurrence, the large-scale studies are needed to obtain conclusive outcome.

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POSTER

Predicting the likelihood of non-sentinel lymph node metastases in breast cancer patients by three nomograms suitable for different institutions

A. Perhavec¹, M. Pohar Perme², M. Hocevar¹, N. Besic¹, J. Zgajnar¹.

¹Institute of Oncology Ljubljana, Department of Surgical Oncology, Ljubljana, Slovenia; ²University of Ljubljana, Institute of Biomedical Informatics, Ljubljana, Slovenia

Background: Several tools for predicting the likelihood of non-sentinel lymph node (non-SLN) involvement in SLN positive breast cancer patients have been created so far. However, they are of limited value outside the institution they were developed because of different methodological protocols. Furthermore, they do not include the results of preoperative ultrasound (US) examination of the axilla, which is an important predictor of non-SLN metastases. The aim of our study was to create and validate different nomograms for predicting the likelihood of non-SLN involvement that would be applicable in different institutions and that would also include the results of the preoperative US examination of the axilla.

Methods: From January 2000 to January 2009 534 breast cancer patients underwent axillary lymph node dissection (ALND) due to metastatic SLN at our institution. Three nomograms (based on the logistic regression results) for predicting the likelihood of non-SLN metastases were created – (i) nomogram suitable for institutions where intraoperative examination of SLNs is not routinely performed in patients with low risk for SLN involvement (our institution), (ii) nomogram suitable for institutions where intraoperative examination of SLNs is not performed and (iii) nomogram suitable for institutions where intraoperative examination of SLNs is standardly performed. The nomograms were validated using bootstrap methods. Calibration curves were illustrated. Mean absolute error and mean area under the ROC curve were calculated for each nomogram.

Results: The nomograms differ in the inclusion of the results of intraoperative examination of SLNs. In all three nomograms US examination of the axilla was a powerful independent variable. Other variables included (different in different nomograms) were tumor size, lymphovascular invasion, metastasis size in SLN, number of negative and number of positive SLNs. Mean absolute error and mean area under the ROC curve equals to 0.016 and 0.77 for the first, 0.023 and 0.75 for the second and 0.014 and 0.79 for the third nomogram.

Conclusions: Three nomograms for predicting the likelihood of non-SLN metastases were created at the Institute of Oncology Ljubljana. They differ in the inclusion of the results of intraoperative examination of SLNs and are thus applicable in different institutions. All of them include the results of the preoperative US examination of the axilla, which turned out as a powerful independent variable. The validation results for all three nomograms seem promising.

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POSTER

The relation between sentinel lymph node micro-metastasis, isolated tumour cells and the final axillary lymph node status after complete dissection

Y. Alabdulkarim¹, R. Younan¹, G. Martin¹, J.F. Boileau¹, E. Nassif¹.

¹CHUM-Hôpital Notre-Dame, Surgical Oncology, Montreal – Quebec, Canada

Background: Sentinel lymph node (SLN) sampling for early breast cancer since its introduction gained a lot of popularity and despite the its debatable false negative risks it remains a widely practiced procedure.

The introduction of the immuno-histochemistry evaluation of the Removed SLN's lead to the occasionally encountered micro-invasion 0.2–2 mm as well as the even smaller isolated tumour cells <0.2 mm, the treatment of which is still a debatable issue between authorities world wide.

Aim: The aim of this study is to compare the outcome of the full axillary dissection after a positive SLN, to identify the presence of non-sentinel positive lymph nodes in each group; macro, micro and ITC positive Nodes. **Method:** we revied all the patients who had SLN in two university hospitals by the group of surgical oncology department in the central university hospital of the university of montreal in a retro spective fasion between January 2004 and July 2008. Inclusion criteria: All patient of T1 and T2, with clinically non-palpable axillary LN's. Exclusion criteria: any patient with a T3 and above, palpable LN, or recurrent cancer.

Data collection included diagnosis, age, clinical stage of the disease, number of lymph nodes, SLN frozen section and the final pathology. End point was the presence or absence of non-sentinel lymph node after axillary dissection.

Results: We reviewed 460 patients, mean age 63.5±11.1 years (ranging 39–83), we had a total of 59/460 (12.8%) patients with a positive SLN, the average No. of SLN's was 2.8±1.6, of these; macrometastasis was identified in 30 SLN's, micro-metastasis in 9 patients, and only isolated tumour cells in 9 patients.

The average No. of lymph nodes removed in the complete axillary dissection was 10.16±3.5 (6–14 Nodes).

The number of patients with T1 primary lesion was 22 compared to 37 with T2 tumour.

The finale Hystopathology showed a total of 12 positive non sentinel LN's (12/59) of which; one non-sentinel LN was positive for ITC's.

All of the positive non-SLN's were associated with those with clear positive SLN's in Frozen section and only one was associated with a SLN with micrometastasis in Frozen section after re-examination with histo-chemical study, however though it was only associated with ITC in one (1/12) non-sentinel LN's after axillary dissection. ($p=0.001$)

When comparing the effect of Micro-metastasis SLN to ITC SLN $p=0.04$. We could not identify any relation between the No. of SLN or the hormone status with the final axillary dissection Non-SLN's.

Conclusion: We concluded that the presence of SLN Micrometastasis or ITC is unlikely to be associated with the presence of any Non-sentinel LN's after complete axillary clearance.

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POSTER

Ductal lavage-a tehnnique for the early diagnosis of breast cancer: our experience during the last three years

R. Iosifidou¹, K. Boglou², D. Siotopoulou², A. Ananiadis¹, X. Destouni²,

A. Bousouleas¹. ¹Anticancer Hospital Theageneio, 3rd Surgical Clinic, Thessaloniki, Greece; ²Anticancer Hospital Theageneio, Cytology Department, Thessaloniki, Greece

Background: Breast cancer is the most frequent cause of death among the women. Ductal lavage is a simple tehnnique which can detect cells from the last duct lobe unit the place that arrives first the breast cancer.

Patients and Methods: 220 patients are enrolled. 122 had positive family history or Gail Risk >1.7, 1 had breast cancer on the other breast, 92 had nipple excretion and 5 had clinical picture of cancer. In these five the technique was held one day before the operation. The mean age was 50.3±10.07 years. After local anaesthetic ointment we inserted a small catheter into the nipple and after massaging the breast we infused 10–20 cc of Ringer Lactated solution and the lactic duct cells are being lavaged. The material from the lavage was examined cytological with thin-prep method. All the patients had mammography or breast ultrasound.

Results: One patient had suspicion of papillary carcinoma in the cytological examination of lavage and 25 had atypia (3: marked, 7: moderate, 15: mild – 11.36% of all the patients and 20.5% of those who had family history or Gail Risk >1.7). 2 had inflammation in the material. As a remark we found also that in patients with family history or history of breast cancer in the other breast there was more cellularity in the material.

5 patients with clinical picture of carcinoma had positive lavage and they had surgical treatment as it was planned. One with marked atypia had open biopsy for a dysplastic area behind the nipple in mammography (histological examination: negative for malignancy). The other two had MRI who was negative and the technique will be repeated after three months. One with suspicion of papillary carcinoma had an MRI which was negative and after 3 months the repeat of ductal lavage was negative. Patients with atypia are under close supervision (physical examination every three months).

Conclusions: As ductal lavage offers a bigger amount of cells from the final duct-lobe unit can help in the early diagnosis of breast cancer expecially in patients with Gail Risk >1.7. It can also help us to avoid repeated cytologic examinations during the years in those patients who have nipple excretion for a long time as the material arrives from the last duct lobe in this technique and the diagnosis is more safe.

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POSTER

Intra-operative assessment of sentinel lymph nodes in breast cancer with touch imprint cytology – a cost effective and reliable method

T. Sircar¹, D. Clarke¹, N. Chachlani², J. Simon², G. Thomas¹, A. Evers¹,

D. Flavin¹, L. Jones¹, S. Harries¹. ¹Warwick Hospital, Breast and General Surgery, Warwick, United Kingdom; ²Warwick Hospital, Pathology, Warwick, United Kingdom

Background: Sentinel lymph node biopsy (SLNB) for staging of axillary lymph nodes in breast carcinoma has recently become the procedure of choice and replaces the axillary node sampling or clearance. To derive maximum benefit for the patient the procedure is best complemented by intra-operative assessment of the sentinel lymph node (SLN). Though the gold standard of this assessment is histological evaluation, this is not possible intra-operatively. Frozen section analysis is labour intensive and requires use of cryostat. PCR technology, though available, requires technical expertise and significant additional funding. We have used intra-operative assessment of the SLN using touch imprint cytology (TIC). This method of assessment is cheap, fast, reliable and technically less demanding as compared to frozen section or PCR technology. The aim of this study was to assess the feasibility and accuracy of this new technique.

Method: SLN's were received fresh and dissected to fully expose the intact node. Nodes less than 5 mm were bisected and others were sliced at 2 mm interval. Each cut surface was touched onto a slide allowing the weight of the node to release the cells onto the slide. Slides were air-dried before staining with Romanowsky stains. The staining process generally took less than 1 minute. In the initial pilot phase (50 cases) each slide was examined by two cytopathologists independently. Results though phoned in were not acted on for axillary node clearance for this phase. Average time taken from receipt of the SLN in the laboratory to reporting has been approximately 10 mins. All TIC results were compared with subsequent routine histology.

Results:

	Patients	Sentinel lymph nodes
Total number	232	388
Sensitivity	54%	55%
Specificity	100%	100%
Positive predictive value	100%	100%
Negative predictive value	88%	90%
Accuracy	90%	91%

In our cohort of 232patients, 52 (22%) were positive for metastatic carcinoma to the SLN. Out of these 52 patients, TIC was positive in 28 (54%). Thus 28 patients (54%) avoided a second operation for axillary clearance. There were no false positives in our series.

Conclusions: TIC has accuracy rate of 90% and positive predictive value of 100%. Patient should be counseled about 10% negative predictive value where TIC is negative but histology is positive. 54% of patients can avoid