

89 POSTER Imprint cytology of sentinel lymph node in patients with breast cancer is a reliable method

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Introduction: Sentinel node biopsy, in many centers, became a standard method of treatment of breast cancer patients. The result of pathologic examination of sentinel node indicates whether an axillary lymphadenectomy should be performed or not. However, intraoperative pathologic examination is a time and work consuming method. Imprint cytology can simplify the procedure of intraoperative evaluation of sentinel node status.

Aim: Assessment of sensitivity of intraoperative imprint cytology in patients with breast cancer undergoing a sentinel node biopsy.

Material and Methods: Studies were conducted in Department of Surgical Oncology, Medical University of Lodz, Poland, from November 2002 to October 2003, and in Department of Surgical Oncology, Medical University of Gdansk, Poland, from November 2001 to January 2003. In 56 patients with breast cancer, 81 sentinel nodes were identified. The sentinel node biopsy was identified using blue dye injected intradermally on the border of areola, or using preoperative lymphoscintigraphy, blue dye mapping and intraoperative detection of gamma radiation (both, blue dye and radioactive tracer injected intradermally on the border of areola. Immediately after sentinel node excision, imprint cytology was performed. The sentinel lymph nodes were dissected in plane parallel to vessel entrance to the examined node. Both parts of lymph were pushed against the slide, fixed and evaluated cytologically. The remaining parts of sentinel nodes were then examined pathologically. In all cases axillary lymphadenectomy were performed. The results of imprint cytology and pathologic examination were compared.

Results: Cytologic examination revealed the presence of metastases in 14 of 81 sentinel nodes (17.3%); pathology revealed metastases in 15 of 81 cases (18.5%). Pathologic examination confirmed the results of cytologic examination in all cases (14/14; 100%). In one case (1/81; 1.2%) imprint cytologic examination did not reveal the presence of metastasis. In this case, the pathology revealed the presence of metastasis in subcapsular part of the sentinel node. The sensitivity of the imprint cytology was 93.3%.

Conclusion: Imprint cytology in patients with breast cancer is a sensitive method of intraoperative evaluation of sentinel lymph nodes.

90 POSTER Radioguided occult lesion localisation (ROLL) and sentinel node biopsy for impalpable invasive breast cancer

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Background: Radioguided Occult Lesion Localisation (ROLL) is a new technique using Technetium-99m macroaggregates of Human Serum Albumin (HSA) for preoperative localisation of impalpable breast lesions. When ROLL is combined with sentinel node biopsy two injections are usually required: i) Intra-tumoural Tc-99m macroaggregates of HSA; ii) Subdermal Tc-99m Nanocol. Further complex techniques have been described for combining ROLL with Sentinel Node Biopsy using Tc-99m Nanocol. The aim of this study was to simplify the technique of ROLL and sentinel node biopsy without compromising tumour excision and sentinel node detection.

Materials and Methods: Twenty patients with impalpable primary invasive breast carcinoma presenting to the Cambridge Breast Unit between December 2002 and June 2003 were recruited into this study. Following written, informed consent, patients were injected with 0.2 mls (90 MBq) Tc-99m Nanocol mixed with 0.2 mls of normal strength 300 contrast (Omnipaque 300) into the centre of the lesion using a Kopan's localising 21 G needle under stereotactic or ultrasound guidance. Immediately after injection, lateral and cranio-caudal mammograms were carried out to confirm accurate localisation. Immediately pre-operatively in the operating theatre and under general anaesthesia, a periareolar intradermal injection of 2 mls of patent blue dye diluted with 3 mls of sterile water was performed. The sentinel node was identified by blue-stained lymphatics/node and the gamma probe. Surgical excision of the primary tumour was carried out assisted by the probe. The post-excision biopsy cavity was evaluated for any residual counts. The excised specimen was orientated and specimen radiographs performed.

Results: In 8 of 20 (40%) patients an immediate re-excision was carried out because of inadequate clearance based on the surgeon's assessment intra-operatively, specimen radiograph or because of high radioactive

counts in the residual cavity. On histological examination, 18 of 20 patients had clear margins; the 2 patients with positive margins had *in situ* disease. In these patients a further excision was performed as a second operative procedure. The sentinel node was identified in all cases. The number of nodes varied from 1 to 5 with a mean of 2.2. In all 7/20 patients were node positive (5 on routine HE staining; 2 on immunohistochemistry with CAM5.2 antibody). Further axillary dissection confirmed no further disease in the axilla.

Conclusions: This modification of the previously described ROLL technique is feasible and safe and does not compromise tumour excision or sentinel node detection.

91 POSTER The "Sentinel Chain": Involvement pattern in patients with multiple sentinel nodes can predict non-sentinel node involvement in breast cancer patients

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Background: Currently, the finding of a positive sentinel lymph node (SLN) in breast cancer patients is considered an indication for axillary dissection. This standard of care might prove to be over-treatment in some, if a subgroup of patients with metastatic SLNs and a very low likelihood of further nodal involvement could be identified. Using the radioactivity count (RAC) when multiple SLNs were identified in patients with a metastatic SLN, we attempted to determine by quantitative means whether the pattern of involvement of SLNs in relation to RAC is predictive of involvement of the remaining axillary nodes.

Methods: Our prospective database of 230 patients who underwent SLN biopsy using radio-labeled filtered sulfur colloid, blue dye and palpation during the years 2000–2002, was reviewed. The criteria for inclusion in this retrospective review were: 1) more than 1 SLN was identified by its radioactivity; 2) information regarding degree of radioactivity (counts per second) was available for every SLN identified; 3) there was at least 1 metastatic SLN; 4) a formal axillary lymph node dissection was done. In each patient, RAC and tumor status were individually recorded for every SLN found. The association of SLN metastasis and RAC was compared with the findings on axillary dissection.

Results: One-hundred-fifty-six (67.6%) of all the patients who had a SLN biopsy had more than one radioactive SLN (median=3, range 2–8 SLNs). Seventy patients (30.4%) had 1 or more SLNs with metastasis. Of these, 29 patients fulfilled our criteria for inclusion. We were able to identify a subgroup of 18 patients in whom the SLNs with the highest RAC (or the clinically suspicious non-radioactive nodes) were metastatic, but lymph nodes with a low RAC (or radioactive SLNs in the presence of clinically suspicious, metastatic non-radioactive nodes) were free of disease. There was a single non-SLN involved in only one of these patients (5.6%) on axillary dissection. In another 9 patients in whom all the radioactive SLNs were metastatic, 7 (77.7%) had additional metastatic non-sentinel lymph nodes found on formal axillary dissection. There were 2 other patients with a skip metastasis in whom SLNs with low RAC were metastatic in the presence of a non-involved high RAC node; in both there were no other metastatic lymph nodes on axillary dissection.

Conclusions: This retrospective analysis suggests the presence of a "sentinel chain" of axillary lymphatic drainage. Patients with a "high RAC-metastatic, low RAC-non-metastatic" pattern of SLN drainage have a low likelihood of metastasis in the remaining axillary lymph nodes. If these findings are verified in prospective studies, lymph node mapping of this type may further reduce the number of patients undergoing axillary lymph node dissection. The false negative rate is equivalent to that accepted for the sentinel lymph node biopsy by most authors.

92 POSTER Adjusting the dose of the radioactive tracer according to patient BMI does not improve visualisation of sentinel nodes

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Background and objectives: Lymphoscintigraphy (LS) fails to visualise hot spots in the axilla in up to 90% patients when intraparenchymal injection routes are used. Non-visualisation is often associated with a failure in intraoperative localisation of sentinel nodes (SN). We aimed to study, whether adjusting the dose of the radioactive tracer according to body mass index (BMI) of the patient leads to more optimal visualisation of the SNs.

The role of a second tracer injection in the success rate of SN identification in patients with non-visualisation of axillary SNs was also studied.

Methods: Patient group I consisted of 356 breast cancer patients who underwent LS and SN biopsy after intratumoural injection of 99Tcm – labelled albumin colloid (Nanocoll®) with a median dose of 92 (range 50–119) MBq. In the patient group II (178 patients) the dose of the tracer was adjusted according to BMI: 113 patients with BMI < 26 received 80 MBq, those 41 with BMI 26–30 received 100 MBq and those 24 with BMI > 30 received 140 MBq. Anterior and lateral scintigraphic imaging was performed approximately four hours after the injection and SN biopsy was performed within 26 hours. A second tracer injection, intratumoural or subdermal, was given in 39 of the 81 patients without axillary hot spots in LS.

Results: Non-visualisation rate of axillary sentinel nodes was 49/356 (14%) in group I and 31/178 (17%) in group II (table 1). The parasternal sentinel nodes were visualised in 68 (19%) patients in group I and 21 (12%) patients in group II.

Table 1. Non-visualisation of axillary sentinel nodes

Patient group	BMI<26	BMI 26–30	BMI>30
I	21/217	19/90	9/49
II	13/113	13/41	5/24

The intraoperative SN identification failed in 3 patients with and 3 without axillary metastases in 39 patients receiving a second injection. 22 patients (3 with and 19 without axillary metastases) of the 42 without a second injection underwent axillary clearance because of non-identification of SNs.

Conclusions: Adjusting the dose of the radioactive tracer according to BMI did not lead to optimised SN visualisation in LS. The failure rate in intraoperative SN identification is minimised using a second tracer injection in patients without axillary hot spots in LS.

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POSTER

The number of resected axillary lymph nodes (ALN) influences the risk for axillary recurrences in node-positive, but not in node-negative patients

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Background: Based on broad evidence, the International Consensus Conference, 'Primary Therapy of Early Breast Cancer' St. Gallen 2003 established sentinel lymph node excision as sufficient surgical procedure in the axilla of node-negative breast cancer patients. However, there is little data available, whether the excision of a low number of ALN increases the risk for axillary recurrences, compared to systematic axillary dissection.

Material and Methods: By multivariate analysis of 3800 pts. treated for early breast cancer UICC stage I–III, we investigated the prognostic relevance of the number of resected ALN for axillary recurrences in patients with and without evidence of axillary lymph node metastases. Pts. with carcinoma in situ, distant metastases at time of presentation, primary systemic therapy, unknown hormone receptor status or histopathological grading were excluded. Data were contemporaneously collected and pts. were followed for a mean of 72 months.

Results: Axillary recurrences as sole manifestation site of recurrence occurred in 67 pts (1.7%). In node negative patients (n=2667), multivariate analysis, allowing for number of removed ALN, histopathological grading, tumor size and hormone receptor status, revealed only grading (P=.04, RR 2.7, 95%CI 1.1–6.1) and tumor size (P=.03, RR 2.8, 95%CI 1.1–6.1), but not the number of removed ALN (P=.42) as predictor for axillary recurrence. In contrast, in node positive pts. (n=1133), multivariate analysis demonstrated the number of removed ALN as independent significant predictor for axillary recurrences (P=.002, RR 9.9, 95%CI 2.7–35.3), next to tumorous fixation of ALN (P=.005, RR 3.6, 95%CI 1.5–8.3).

Discussion: There is no evidence that a low number of removed ALN increases the risk for axillary recurrences in node negative pts. However, evidence suggest that complete axillary dissection should be maintained in node positive pts.

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POSTER

Long-term follow-up of sentinel node negative breast cancer patients: a quality control

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Sentinel node biopsy (SNB) in breast cancer accurately predicts axillary status and is generally adopted for disease staging. To evaluate the feasibility of this technique it is important to determine the frequency and impact of local axillary failure after negative SNB. The purpose of this study

was to evaluate the axillary recurrence rate in our institute and to determine if axillary control is lost in case of recurrence. From November 1998 to November 2001, 330 consecutive patients with T1–2 breast cancer without clinical or sonographic signs of lymph node involvement, underwent SNB. 190 patients who had a negative sentinel node biopsy without additional axillary dissection were studied prospectively in order to identify tumour recurrence. After a median follow-up of 42 months (24–60) four patients (2%) developed overt axillary disease. The recurrences were treated with axillary node dissection, chemotherapy and radiotherapy in case of involvement of four or more lymph nodes. During follow-up no more axillary recurrences occurred. Reassessment of the SNB procedures revealed two doubtful procedures. In one patient the axillary 'recurrence' was due to a new primary carcinoma. This study provides reassurance that SNB is safe. In case of recurrence, the axilla can be treated successfully without losing locally control. It also emphasises that conventional axillary dissection should be performed in case of doubt of the SNB procedure.

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POSTER

Patients needs and preferences in routine follow-up after treatment for breast cancer

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Background: After primary care for breast cancer patients participate in routine follow-up care. Informational needs of patients may change over time. In this study we focussed on a patient's needs and preferences in a routine follow-up programme 2–4 years after treatment for primary breast cancer. These needs include information and preferences regarding additional investigations and organisation of follow-up care.

Methods: A cross-sectional survey was performed using a postal questionnaire among women without any sign of relapse during the routine follow-up period. The questionnaire was sent 2–4 years after primary surgical treatment.

Results: Most important to patients was information on long-term effects of treatment and prognosis, discussion of prevention of breast cancer and hereditary factors and changes in the untreated breast. Patients preferred additional investigations (such as X-ray and blood tests) to be part of routine follow-up visits. More than half of the patients preferred lifetime follow-up, performed by a hospital doctor. Less satisfaction with interpersonal aspects and higher scores on the HADS-anxiety scale were related to higher informational needs. Higher scores on the HADS-anxiety and depression scale were related to stronger preferences for additional investigations. Receiving adjuvant hormonal or radiotherapy was related to a preference for a more intensive follow-up schedule. There were no significant differences between patients treated with mastectomy compared to those treated with breast conserving therapy. During routine follow-up after a diagnosis of breast cancer, not all patients needed all types of information.

Conclusion: When introducing alternative follow-up schedules, individual patients' information needs and preferences should be identified early and incorporated into the follow-up routine care, to target resources and maximise the likelihood that positive patient outcomes will result.

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POSTER

Detection of sentinel lymph node in breast cancer: blue dye technique versus combined blue dye–radioactive tracer technique

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Background: Sentinel lymph node biopsy in breast cancer can be used to select patients in which axillary lymph node dissection could be avoided. In this study we compared the value of two methods for identification of sentinel node (SN) using either only blue dye or combination of blue dye and radioactive tracer.

Material and methods: All patients were women with clinically T1–2N0M0 breast cancer. They were randomized into two groups. Group A: In 50 patients SN marking was performed only with blue dye with visual intraoperative identification of SNs. Group B: In 100 patients combined SN marking was performed (blue dye and radiotracer) with intraoperative visual and gamma probe (Gammamed IV®-Capintec) identification of SNs. We used 2 ml of blue dye Patentblau V® (Byk Gulden). Radiotracer was Antimony sulfide marked with Tc 99 m and of 0.3 mCi (9.6 MBq) activity. Application method of both contrasts was peritumoral. Radiotracer