336 Poster

A multicentric analysis and an introduction of a German prospective study to evaluate the value of sentinel node excision after neoadjuvant chemotherapy

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Introduction: Sentinel node excision (SNE) is a routine procedure in the treatment of primary breast cancer. Neoadjuvant chemotherapy (primary systemic therapy = PST) is currently used in locally advanced and inflammatory breast cancer and rather recommended for patients with tumours of unfavourable tumor biology who are likely to recieve adjuvant therapy anyway.. Nodal downstaging is reported in about 16−23% of all patients after PST. SNB after PST is not recommended as a routine procedure in national and international guidelines. We evaluated the safety and reliability of SNB with determination of detection rate and the false-negative rate after PST in a multicentric setting.

Material and Methods: retrospective analysis of 128 patients treated in 3 different centers with primary systemic therapy innational PST trials as TECHNO, PREPARE and GeparQuattro.

Results: Between 2003 and 2005 92 out of 128 patients received PST and underwent consecutive SNB after PST. The median age was 49 years. In 88 of 92 patients (96%) the sentinel was detected either by lymphscintigraphy and/or with blue dye during surgery. The remaining 4 patients received classical ALND. As SNB showed tumor-free sentinel nodes 12 patients refused to undergo further ALND. 76 patients received SNB and further ALND irrespectively of nodal sentinel node status. 30 of 92 patients showed positive lymph nodes out of which 5 patients had a negative sentinel node biopsy. Thus, the false negative rate is calculated 5/30 = 16.6%. In 74 patients Level I and II ALND was performed after SNB, 4 patients received a Level III lymph node resection, in 1 patient only Level I ALND was reported and in 1 patient no detail of complete ALND was stated.

Conclusion. The results confirm the existing studies. Compared to the adjuvant setting the results are not satisfying and need to be evaluated in a prospective trial as it is done in the German neoadjuvant SENTINA protocol (Sentinel Node excision after NeoAdjuvant therapy).

337 Poster

Added value of preoperative SPECT/CT in surgery planning for internal mammary sentinel node localisation in patients with breast cancer

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Background: Accurate localisation of sentinel nodes (SNs) outside the axilla is a major concern when interpreting lymphoscintigraphy. The use of SPECT/CT for the localisation of SNs is a recent non-invasive technique. The purpose of this study is to investigate whether SPECT/CT has a an influence on surgical decision making, compared to lymphoscintigraphy alone in patients with internal mammary SN localisation.

Material and Methods: All consecutive patients from 2006 up to 2008 with a T1−3N0 breast carcinoma with internal mammary SN localisation on lymphoscintigraphy were prospectively included. Lymphoscintigraphy was followed by SPECT-CT in all patients with SNs outside the axilla. During surgery attempts were made to harvest both axillary and non-axillary SNs. The differences between the lymphoscintigraphy and the SPECT/CT with respect to the number and location of hot spots as well as the surgical and pathological results were analysed.

Results: 42 patients (mean age: 54.8 yrs) were included. In 13 patients (30.9%), the SPECT/CT provided no additional information compared to lymphoscintigraphy alone. In 3 patients (7.1%) the SPECT/CT provided a closer determination of the anatomical location of the hot spot, but without surgical consequences. In 2 patients (4.8%) the lymphoscintigraphy turned out to be more accurate than the SPECT/CT. In 1 patient (2.4%) the lymphoscintigraphy and the SPECT/CT located the SN retrosternal, but the SN appeared to be parasternal during surgery.

In the remaining 23 patients (54.8%) the SPECT/CT results had a major impact on the surgical procedure. In 4 patients (9.5%), the SPECT/CT showed 6 additional SNs. In 20 patients (47.6%) the SPECT/CT results gave substantial reason not to explore the SN as visualised on the lympho-scintigraphy: in 12 patients due to a surgically inaccessible localisation, and in 8 patients because the hotspot could not be linked to an anatomic substrate on the SPECT/CT. In one patient an extra axillary SN and an inaccessible SN was detected on SPECT/CT.

Conclusions: In the majority of patients, SPECT/CT has a considerable influence on the surgical procedure. Not only to improve localisation and to increase the number of visualized SNs, but foremost, to reduce the number of unnecessary and potentially harmful explorations. Thus, SPECT/CT has a major impact on surgical decision making compared to lymphoscintigraphy alone, in patients with internal mammary SN localisation.

338 Poster

Sentinel node biopsy in ductal carcinoma in situ of the breast – results in 99 cases

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Background: Ductal carcinoma in situ (DCIS) represents a proliferation of malignant-appearing cells in the breast that have not invaded beyond the ductal basement membrane. DCIS diagnoses exclude axillary lymph node infiltration. The risk for nodal metastases in patients with DCIS is <3%. Microinvasive tumors are more frequent in association with large or high grade extensive disease. The aim of this study is to assess the requirement of sentinel node biopsy (SLNB) in DCIS management.

Material and Methods: Between December 1998 and September 2007, 970 SLNB were performed as the staging procedure for T1 and T2 breast cancer patients without palpable axillary lymph nodes. In 99 patients histologic diagnoses was DCIS, 91.9% of them non palpable mammography lesion. Diagnostic procedure for the breast disease was: Advanced breast biopsy instrumentation (ABBI) 36.4%; core biopsy under stereotactic guidance 25.3%; wire-guided open breast biopsy 18.2%; vacuum-assisted biopsy device (Mammotome®) 12.1% and other methods 8%.

SLN localization was performed by combined technique (dye and radioisotope) in 73.7% and by isotope technique in 26.3%. Breast conserving procedures were used in 73.3% of patients, mastectomy with or without associated reconstruction in the rest of cases. Histologic analysis included serial sectioning, H&E staining and IHC examination (EMA, AE1/AE3).

Results: Identification rate was 98%. Lymphatic mapping was negative in four (4%) patients, axillary positive in eighty (80.8%), internal mammary chain in one (1%), axillary and internal mammary positive in thir-teen (13.1%), intramammary in one (1%). Total number of excised sentinel nodes was 135 (1.39±0.6), 120 axillary located, 14 internal mammary and one intramammary node. Histologic exam showed micrometastatic disease in 2 (3.1%) cases, both histologic grade 3 DCIS. Complete axillary lymphadenectomy didn't found any other metastatic node. In other three patients, IHC exam demonstrated isolated tumoral cells. No additional surgical treatment was performed in these cases.

Conclusion: SLNB is a useful staging tool, which can be used in selected patients with DCIS. The disclosure of microinvasive disease is the main indication for SLNB, so large tumors treated with mastectomy or high grade DCIS could possibly benefit from its implementation.

339 Poster

Sentinel lymph node biopsy for breast cancer using a new camera system for simultaneous capturing color and near-infrared fluorescence of indocyanine green

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Background: Dye and/or radioisotope (RI) methods are usually performed to detect sentinel lymphnode (SLN) of breast cancer. However, special surgical training for dye method and radiation control area for RI method is necessary. Another method, based on the near-infrared (NIR) fluorescence of indocyanine green (ICG) dye, might be considered to be a new alternative to resolve these problems of conventional dye and RI methods. It provided direct visual images of lymphatic flow over skin. However, it was difficult to detect the anatomical relationship between ICG-enhanced structures and non-enhanced surrounding tissues intraoperatively with currently available systems for capturing of monochrome images. To visualize ICG-enhanced structures against a background of vivid tissue