color, we developed a new camera for simultaneous capturing of color and NIR fluorescence.

Materials and Methods: A combination of custom-made optical filters for attenuation of visible light and enhancement of NIR fluorescence was mounted on an ultra-high sensitive color CCD image sensor (SANYO LC99169). A light source for excitation of ICG dye was made with an array of light emitting diodes (LED) at 780 nm. Since April 2007, we performed SLN biopsy in 40 patients with histologically confirmed breast cancer, tumor size $\leqslant$3 cm and clinically node negative, using this camera system. After ICG dye (1.25 mg/body) was injected subcutaneously surround areola, lymphatic flow was observed on the color monitor and the site of skin incision was decided. Simultaneously, usual combination methods of dye (indigo-carmine) and RI (99mTc-Sn colloid, 3mCi) were performed in all patients.

Results: In all of 40 patients, SLNs were identified by NIR fluorescence. This result was not inferior to those of simultaneously performed dye (39/40) and RI method (35/40). Moreover, the images, acquired using a new camera system, can be used as an intraoperative navigator.

Conclusion: Fluorescence method using our new camera system, which can simultaneously capture color and NIR fluorescence, is expected to be a new alternative to conventional dye and/or RI method.

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Factors predicting sentinel and non-sentinel lymph node metastases in patients with breast cancer

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Background: The sentinel lymph node (SLN) is the only focus of axillary metastasis in a significant proportion of patients. Factors that were associated with a negative sentinel lymph node, or negative non-sentinel lymph nodes were investigated in this study in order to omit complete axillary lymph node dissection.

Patients and Methods: Data were retrospectively reviewed for 579 consecutive patients with clinical T1/T2 N0 breast cancer who underwent SLN biopsy. Multiple sectioning and immunohistochemical (IHC) analysis were performed to evaluate the SLNs. All clinicopathologic criteria were reviewed and correlated with the metastatic involvement of sentinel and non-SLNs by using the new AJCC staging criteria that defined micrometastases (<0.2 cm) and macrometastases ($\geqslant$0.2 cm).

Results: Lymphatic mapping was performed using isosulphan blue dye alone (58.4%) or in addition to a technetium Tc 99m sulfur colloid technique (41.6%). SLN was identified in 558 patients (96%). Among those, SLN micrometastases were identified in 39 patients (18.3%) patients whereas macrometastases were detected in the remaining 174 patients (81.7%). Factors including tumor size more than 2 cm (T1, 31% vs T2, 48.7%; $p < 0.0001$) and presence of lymphovascular invasion (LVI−, 26.5% vs LVI+, 54%; $p < 0.001$), and presence of multifocal/multicentric tumors (unifocal tumor, 36.9% vs multifocal/multicentric tumors, 49.3%; $p = 0.044$) were associated with positive SLNs. Furthermore, tumor size more than 2 cm (T1, 37.3% vs T2, 53.2%; $p = 0.02$), the presence of macrometastases in SLNs (micrometastasis, 20.6% vs macrometastases, 56%; $p < 0.0001$) and extracapsular node extension (extracapsular node extension −, 30.2% vs extracapsular node extension +, 67%; $p < 0.0001$) were found as significant predictive factors of non-SLN metastases.

Conclusion: Our findings suggest that the size and the extention of metastases in SLN are important factors predicting the non-SLN metastases. Therefore, complete axillary dissections could be omitted in selected patients with T1 tumors and micrometastases without extracapsular node extention.

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Advantages of partial intraoperative pathologic evaluation of sentinel lymph node biopsy – our experience in 267 cases of breast cancer and review of the methods

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Introduction: SLN evaluation performed by total intraoperative evaluation by H&E and IHC with more than 50 section, as described by Viale and Coll. is expensive and needs time but is definitive, on the other hand microscopic examination of delayed paraffin section necessitated a second surgical approach for complete axillary dissection if the SLN is positive To avoid this reoperation and the patient stress correlated by reducing costs and time of full examination, a partial intraoperative SLN evaluation is proposed.

Patients and Methods: SLN technique was applied to a total of 238 breast cancer SLN biopsies were subjected to a rapid intraoperative partial (only four section by H&E) pathologic examination with synchronous total axillary dissection offered to patients with a positive finding. All intraoperative pathologic examination were followed by a definitive evaluation, axillary node dissection, performed with a second operative procedure within 15 day was performed in N+ pts.

Intraoperative Pathologic Evaluation: Lymph node specimens were sent fresh to the pathology laboratory. Each lymph node was cut in two parts along the longitudinal axis and grossly examined for macroscopic foci of tumor. One section was immediately frozen for intraoperative examination while the mirror section was kept for the permanent evaluation. Four intraoperative slides of the lymph node obtained were processed with hematoxylin and eosin (H&E). It take in average 20 minutes.

Permanent Pathologic Evaluation: Each half of the previously bivalved SLN specimen was fixed in 10% formalin, paraffin imbedded and all sectioned each 200 micron. All sections were stained by hematoxylin and eosin and evaluated with the technique of immunohistochemistry using a monoclonal antibody for cytokeratin.

Results: 73pts (28.52%) resulted positive at permanent pathologic SLN evaluation 39 of whom had been found positive at the intraoperative evaluation. False-negative SLNs resulted in 29 cases. Micrometastases were identified in 30 patients, 4 of whom were positive at the intraoperative pathologic evaluation. (sensitivity 16%). The presence of isolated tumor cells were reported in 12 patients and 2 of them were identified at the intraoperative evaluation. The overall sensitivity of the intraoperative detection of metastasis in our study was 57%. The specificity was 100%, Negative Predictive value was 85% and Accuracy 88%.

34/256 patients need a second operation that means 13.28%, 30 patients had only micrometastasis with non evidence of positive nodes after total axillary clearance.

Discussion: Partial intropeative evaluation if compared with the complete intraoperative evaluation, that also include immunostaining for cytokeratins using a rapid immunocytochemical assay appears to be less expensive and more rapid and in our experience only 13.28% of pt. need a second operation, if we look to the patient with macromets only 8 on 256 that is 3.0%.

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Factors predicting failure of sentinel lymph node mapping in breast cancer patients with previous axillary lymph node surgery

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Background: Previous axillary lymph node surgery is considered as a contraindication for Sentinel node (SN) mapping in breast cancer patients. We determined the feasibility and accuracy of lymphatic mapping following previous axillary surgery and evaluated parameters associated with mapping failure.

Methods: Lymphatic mapping using peritumoural injection of a radio-colloid and blue dye was attempted in 34 patients with primary (n = 7) or recurrent (n = 27) breast cancer and a history of previous axillary lymph node dissection (n = 15) or Sentinel node biopsy (n = 19).

Results: Lymphatic mapping identified a mean number of 1.6 (range 1−3) lymph nodes in 22 of 34 patients (identification rate 65%). The lymph nodes were removed from the ipsilateral axilla (n = 15), the internal mammary chain (n = 3), both the internal mammary nodes and the axilla (n = 2), the interpectoral space (n = 1) and the contralateral axilla (n = 1). 4/22 patients had a positive lymph node (two had a micrometastasis or isolated tumor cells, two had macrometastases), 18/22 patients had a negative lymph node. Axillary lymph node dissection was done in 15 of 18 patients but found no positive nodes (false negative rate = 0). A negative lymphoscintigram ($p < 0.001$) and a number of more than 10 lymph nodes removed at the time of previous axillary lymph node surgery ($p = 0.02$) were significantly associated with a mapping failure. The time between previous axillary surgery and the mapping procedure, previous chemotherapy and/or previous radiation showed a lower (not significant) identification rate.

Conclusion: Lymphatic mapping following prior axillary surgery was accurate but associated with a low identification rate. The lymphatic drainage pattern in these patients was unpredictable and the use of a radionuclide for mapping was prerequisite for a successful mapping procedure.