Differences between both groups in histologic grade and IMN irradiation have statistical significance, whereas tumor localization, histology, metastatic axillary nodes, adjuvant chemotheraphy or hormonotheraphy, DFS and OS are not statiscally significant. Possible statistically significant differences can be hidden because of a small positive IMN sample.

Conclusions: Metastatic IMN in breast cancer is rare and can be influenced by some factors: breast tumor location, size or histopathological grade. Sampling the IMN can be necessary to obtain complete staging. Without IMN surgical approach, 22% of our patients would have been under-staged and 80% under-treated. IMN affection means a higher breast cancer stage and usually involves an aggressive treatment, what could increase DFS and OS. More studies are needed to increase the number of patients and confirm our data.

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Influence of the type of breast cancer surgery on the upper limb function

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Background: Sentinel lymph node biopsy (SLNB) is widely accepted as an excellent method in the management of early breast cancer in patients with clinically negative axillary lymph nodes. Because SLNB requires less invasive surgery to the axilla than axillary lymph node dissection (ALND), it was assumed to result in reduced shoulder mobility. The aim of this study was to evaluate the relationship between the type of breast cancer surgery and early postoperative arm mobility.

Materials and Methods: The study group consisted of 361 consecutive patients, aged 28 to 86 years (median age 57) with breast cancer, operated upon in the Department of Breast Surgery and evaluated in the Department of Rehabilitation Medicine afterward, between February 2005 and April 2009. Out of the 361 patients, 169 (46.8% − group 1) underwent breast conserving therapy with SLNB, 78 (21.6% − group 2) simple mastectomy with SLNB, 54 (15.0% − group 3) breast conserving therapy with ALND and 60 (16.6% − group 4) modified radical mastectomy. Upper limb function was evaluated one day before surgery and 3 days, 1 month, and 3 months after surgery. In this study assessment consisted of shoulder flexion and shoulder abduction.

Results: After 3 days, a significant impairment of shoulder flexion and abduction was measured and patients in the ALND group (group 3 and 4) had more limitations in shoulder mobility than patients in the SLNB group (group1 and 2) [shoulder flexion: 95.2±32.7 degree (ALND group) vs. 118.9±36.6 degree (SLNB group), $p < 0.001$, shoulder abduction: 87.2±32.4 degree (ALND group) vs. 112.9±42.1 degree (SLNB group), $p < 0.001$]. After 1 month, ALND patients had more limitations in shoulder mobility than SLNB patients [shoulder flexion: 142.2±24.6 degree (ALND group) vs. 161.8±21.3 degree (SLNB group), $p < 0.001$, shoulder abduction: 136.6±35.3 degree (ALND group) vs. 159.4±30.2 degree (SLNB group), $p < 0.001$]. After 3 months, shoulder mobility was not different between the ALND group ($n = 44$) and the SLNB group ($n = 84$).

Conclusions: In terms of upper limb functional status, the benefits of SLNB over ALND was observed at the early postoperative time. However, long-term effects have to be confirmed by further, larger series.

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Preliminary experiences of sentinel lymph node biopsy for early breast cancer by a new camera system simultaneously capturing color and near-infrared fluorescence

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Background: Sentinel lymph node biopsy (SLNB) for early breast cancer has already become a standard of care, alternating axillary lymph nodes dissection. The most common methods for identifying sentinel lymph node (SLN) are a blue dye and/or radioisotope (RI) method. However, a dye method requires special surgical training to maintain high identification rate of SLN and an RI method requires a radiation control area. A new 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. By providing direct visual images of lymphatic flow over skin, it makes a dye method easier and more accurate. We developed a new camera system for simultaneous capturing of color and NIR fluorescence to visualize ICG-enhanced structures against a background of vivid tissue color. We named our new camera system Hyper Eye Medical System (HEMS).

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. A light source for excitation of ICG dye was made with an array of light emitting diodes (LED) at 780 nm.

Between April 2007 and August 2009, we performed SLNB in 113 patients with histologically confirmed breast cancer, tumor size $\leqslant 3$ cm and clinically node negative, using HEMS. After ICG dye (1.25 mg/body) was subdermally injected in the subareolar site, the subcutaneous lymphatic drainage pathway was observed on the color monitor and the site of skin incision was decided. Simultaneously, usual combination methods of indigo carmine dye and RI with 99m-Tc Sn colloid were performed in all patients.

Results: In all of 113 patients, SLNs were identified by NIR fluorescence. This result was equal to those of simultaneously performed dye and RI methods. Moreover, the images, acquired using HMES, can be used as an intra-operative navigator.

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

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Blue dye alone in sentinel node biopsy is a safe and accurate technique in selected early breast cancer − a single institution experience

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Aim: To assess the safety and efficacy of sentinel node biopsy in selected cases of early breast cancer in a single institution using the blue dye method only.

Materials and Methods: Histologically proven invasive breast cancer with an a priori predictive lymph node positivity of 20% were offered sentinel lymph node biopsy (SLNB) using a blue dye only method. 220 consecutive patients from April 2002 till April 2007 with early breast cancer who fit the criteria were prospectively entered into this study. SLNB using blue dye alone was performed in all the patients. Those with any invasive cancer in the SLNB proceeded to have an Axillary Lymph Node Dissection (ALND). This includes those positive on frozen section as well as on definitive histology, including immunohistochemistry. Those in which no SLNB were found proceeded to have an ALND.

Results: Most studies utilizing a dual method of SLNB report axillary recurrence after negative SLNB at 1% or less after a median follow up of 2−3years. With a conservative estimate of recurrence in this study of 4%, with an a=0.05 and b=0.9, the sample size necessary would be 154. We thus anticipate that 200 patients would be needed for a difference in the blue dye alone SLNB compared to the dual method, if any, is to be apparent.

In our experience, we had an identification rate of 94% (207/220). Of those identified, 21% (45/207) was positive for invasive cancer on frozen section. A further 8 SLND were positive only on final histology. With a median follow up of 49.5 months (range 7−74 months), there were no axillary recurrences and 2 patients with breast only local recurrence. 1 patient subsequently developed metastatic bone disease 49 months after initial treatment and is still alive. One patient had a subsequent diagnosis of leukemia and died due to leukemia related causes.

Conclusion: Blue dye only technique is safe, and in experienced hands has comparable results to published combined techniques.

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Validation of the MSKCC nomogram to predict sentinel lymph node metastases in a Dutch breast cancer population

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Background: The Memorial Sloan-Kettering Cancer Center (MSKCC) developed a nomogram to predict the likelihood of sentinel lymph node (SLN) metastases in breast cancer patients. The nomogram was validated on a Dutch population.

Methods: Data of 716 breast cancer patients who underwent a successful SLN biopsy were collected. Positive SLN metastases were found in 204 patients. Frozen section, serial haematoxylin and eosin (HE) and immunohistochemistry (IHC) were performed routinely on each sentinel node. A ROC curve was drawn and the area under the curve was calculated to assess the discriminative power of the nomogram.

Results: Tumour size ($p = 0.000$), multifocality ($p = 0.038$) and lympho-vascular invasion ($p = 0.000$) were identified as independent predictors of