Technical challenges and clinical implications of preoperative sentinel node identification in breast cancer and cutaneous melanoma

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ABSTRACT

The PhD project is carried out at Rigshospitalet. The purpose was to investigate aspects of the currently used technique for sentinel node (SN) identification in breast cancer and melanoma. The aim is to create better basis for staging by accurate diagnosis of possible subclinical lymph node spread, in order to select patients for complete regional lymph node dissection in case of spread. The thesis consists of three clinical studies and one experimental study.

Lymphoscintigraphy has gained new insight into anatomy and function of the lymph system and has brought into focus the clinical unpredictable variation in the lymphatic drainage, especially from the skin.

Technical aspects are still candidates for improvement, i.e. choice of radiocolloid, injection technique, interval between injection, imaging and surgery, and influence of SN outside the classical lymph node regions.

A limitation of the SN procedure is the lack of knowledge before the operation if the SN contains metastasis. Preoperative noninvasive detection of possible metastasis in the SN would improve the procedure substantially.

In study I-III we found that certain factors (i.e. injected activity and timing between injection, imaging and surgery) had significant influence on scintigraphic visualization of SN in contrary to other technical, but for the result unimportant variations. In transit lymph nodes at the scintigraphy should be handled like regular regional SNs since they have similar prognostic relevance.

Our experimental study in mice showed that the theoretical basis is present for development of a new technique for preoperative malignant SN identification by double isotope SN immunolymphoscintigraphy with radioactively labeled tumour specific monoclonal antibodies.