

314

ORAL

MR imaging in the preoperative staging of breast carcinoma: Useful or risky?

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Purpose: To determine if MR mammography is a necessary complementary examination in the preoperative staging of breast cancer patients or if it overestimates the extent of the tumor causing unnecessary wider surgery.

Materials and Methods: We reviewed 39 patients with a malignant breast tumor who underwent preoperative MR imaging at 1.5 T. All these patients had dense breast tissue. Clinical examination and imaging findings were compared with histologic results regarding tumor size and multifocality.

Results: MR imaging depicted 33 invasive carcinomas and 5 ductal carcinomas in situ (DCIS), and missed 1 DCIS. In 15 patients mammography and ultrasound underestimated tumor size. Multifocal disease was suspected in 7 patients on conventional imaging while MR showed an additional enhancing mass in 14 cases, 3 were false positive. In the patients with one enhancing focus the size on MR correlated exactly with histology in 9 cases, MR overestimated the size in 13 patients and underestimated the size in 3 cases, in 2 of which surrounding DCIS was missed. Therapy was altered by performing mastectomy in 8 patients.

Conclusion: MR imaging allows detection of multifocal cancers and is the most accurate in assessing the extent of a malignant lesion in patients with suspected breast cancer in dense breasts but histology of the additional mass should be performed before changing surgical approach.

315

POSTER

Axillary staging of T1-T2 breast cancer

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Objectives and Methods: From December 1996 to January 1998 77 T1-T2 N0 breast cancer patients have been recruited for a multicentric study (involving five institutions) on the lympho-scintigraphic search of the axillary sentinel node (SN). The protocol provided a subdermic injection of 99mTc labelled microcolloids (Nanocol or Albures, 126 + 52 uCi in a 0.2 cc volume) and at least two gamma camera imagings. The SN was searched intraoperatively with a NaI or a CdTe hand/held gamma probe and excised before performing the standard axillary dissection.

Results: In 7 out of 77 cases lymphoscintigraphy was unsuccessful (9%); in 3 cases the SN was not localised (3.9%). 67 SN out of 77 cases were found and excised (87%). The SN proved to be predictive of axillary status in 62 cases on 67 (92.5%). In 14/27 cases the SN alone was metastatic (51.8 out of the N1 cases); in 5 cases the SN, reactive, did not match with the axillary status (5/40, 12.5% of false negatives).

Conclusions: These results, although affected by a "learning curve" effect, appear promising; the sentinel node evaluation can be considered a reliable non invasive staging method for T1-T2 N0 breast cancer. Our study will close after a recruitment of 200 cases.

316

POSTER

A prospective assessment of magnetic resonance mammography (MRM) with conventional triple assessment in symptomatic breast disease

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The accepted gold standard of triple assessment of breast lesions i.e. clinical examination, fine needle aspiration cytology (FNA) and mammography, does not always establish a diagnosis and surgical biopsy is therefore required. Contrast enhanced dynamic magnetic resonance mammography (MRM) represents an emerging alternative diagnostic modality. The aim of this study was to compare the diagnostic accuracy of MRM with standard triple assessment for the evaluation of symptomatic breast lesions.

Two hundred and eighty-three symptomatic patients (median age 51, range 20-80) were recruited. The 112 patients who did not undergo operation have been followed up clinically and radiologically for a median of 20

months (IQR 18-24 months). Sensitivities for detection of malignancy were: clinical examination 84.73%, mammography 86.26%, FNA 80.3%, triple assessment 99.23% and MRM 99.23%. Histologically confirmed multifocal disease was detected pre-operatively in 40 patients by MRM but in only 9 (22.5%) on mammography. The specificity for the diagnosis of benign disease was: clinical examination 83.11%, ultrasound 88.88%, mammography 86.36%, FNA 95.0%, triple assessment 77.27% and MRM 98.7%.

Dynamic MRM is superior to standard triple assessment for the evaluation of symptomatic breast lesions. As such utilizing MRM will facilitate a significant reduction in diagnostic surgical biopsies.

317

POSTER

Palpable breast tumors: Preoperative determination of histology and receptor status

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Purpose: In this prospective study the high speed biopsy gun was evaluated in patients with palpable breast tumors. Preoperative determination of histology and receptor status is crucial in optimizing the management of breast cancer.

Methods: High speed biopsies were performed in 187 patients (185 female, 2 male). The system BIP High Speed Multi 22/15 was used with 16-gauge needles at a speed of 30 m/sec. The inner needle has got a notch where the specimen is caught and then the outer cylindrical shaft cuts it off at high speed - hindering the tumor from slipping away - and covers it, so that it can be salvaged safely and with a minimum risk of contamination.

Results: The quality of the biopsies was markedly improved as compared to conventional systems, they yielded well preserved and representative tissue material and all of them could be used for frozen sections and for determination of receptor status. Usually one cylinder was enough for diagnosis. In 134 patients (71.7%) carcinoma of the breast was found (84.3% invasive ductal, 14.2% invasive lobular, 0.75% medullary and 0.75% adenoid-cystic), one patient had non Hodgkin's lymphoma. Five biopsies were classified as highly suspicious (high grade atypical ductal hyperplasia). In all cases malignancy was confirmed by operation and histology. Estrogen receptors (ER) were negative in 30%, progesterone receptors (PR) in 41%. The remaining receptor scores showed the following distribution: 1-3: ER 21%, PR 22%. 4-8: ER 34%, PR 23%. 9-12: ER 15%, PR 14%. Benign tumors were found in 23.5%. In 3 patients malignant tumors were missed at biopsy (1.6% false negative). Complications: In one patient bleeding from a subcutaneous vein (which could be stopped by compression) was observed, no cases of contamination of the biopsy canal were seen.

Conclusion: High speed biopsy provides a reliable and simple way of preoperative determination of histology and receptor status in patients with palpable breast tumors. In cases of high grade atypical ductal hyperplasia or ductal carcinoma in situ, however, the diagnosis should always be confirmed by removal of the entire lesion.

318

POSTER

Ultrasound guided core biopsy of suspicious mammographic calcifications using high frequency and power Doppler ultrasound

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Purpose: The pre-operative diagnosis of suspicious mammographic microcalcifications usually requires stereotaxic needle biopsy as they are not visible using conventional ultrasound (US). The aim of this study is to see if high frequency US and power Doppler (PD) can aid detection and biopsy of microcalcification. We also attempt to characterise the US appearances which may help discriminate benign lesions from malignant pathology.

Methods: We prospectively performed high frequency US (13 MHz) and PD on 44 consecutive patients presenting with microcalcifications which was assessed as requiring needle biopsy. There was no associated mammographic or palpable masses. The presence of any US abnormality and abnormal flow pattern on PD was documented. Ultrasound guided core biopsy (USCB) was performed where possible. Stereotaxic biopsy was performed when US guided biopsy was unsuccessful. All patients underwent surgery if a diagnosis of malignancy was made on core biopsy or if core biopsy was non-diagnostic.

Results: Of 44 patients, 41 (93%) had ultrasound abnormalities corresponding to mammographic calcification. Two cases could not be imaged

due to the depth of calcification. USCB was performed on 37 patients. 31/37 USCB obtained a definitive result (83.8%). USCB was non-diagnostic in 4/9 benign (44.4%) and 4/28 (14.3%) malignant lesions biopsied. The absolute sensitivity for malignancy using US guided biopsy was 85.7% (24/28). US guided biopsy correctly identified invasive disease in 12/20 (60%) cases. Abnormal flow on PD did not discriminate between benign and malignant abnormalities but was present in 56.1% of malignancies containing invasive disease. The presence of focal flow on PD was useful in directing successful biopsy in 8 cases.

Conclusion: The combination of high frequency US with PD is useful in the detection and guidance of successful US guided biopsy of micro-calcifications particularly in the detection of invasive foci in areas of in-situ carcinoma.

319

POSTER

Pre-operative detection of breast cancer multicentricity with MRI

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Introduction: Whilst radiography relies on tissue density for breast cancer detection, contrast-enhanced magnetic resonance imaging (MRI) relies on vascularity and vascular permeability. In this study we compared the pre-operative detection of cancer foci by MRI with radiological-histological examination of resected specimens (modified Egan's method).

Method: Ten patients with newly diagnosed breast cancer underwent pre-operative contrast-enhanced breast MRI using a transverse T1-weighted three dimensional (3D) FLASH sequence. After surgical excision the specimens were fixed and cut in the same plane as the MRI. After histopathological sampling by an experienced pathologist, specimen slices were radiographed. Two observers identified radiological abnormalities (calcifications, densities or spiculations) and all lesions that were deemed suspicious by either observer were sampled and examined histologically. MRI images were reviewed independently and findings compared with histology.

Results: On MRI, 19 enhancing foci separate from the main tumour were identified in 7 out of 10 patients. On radiography of specimen slices, 71 suspicious areas were sampled and histological examination of these revealed 15 areas of in-situ (9) or invasive cancer (6) in 5 patients. All 5 patients with cancer foci were amongst the 7 patients who had enhancing foci on MRI. In 2 of these 5 patients, the tumour was surrounded by widespread enhancement on MRI and all 11 areas sampled showed cancer foci. In all wide local excision specimens, the enhancing foci on MRI were within 11 mm of the tumour edge and therefore within the resected specimen. Assuming that the radiological-histological correlational method is the gold standard for detection of cancer foci, the sensitivity of MRI is 93% (14/15) and specificity 79% (15/19).

Conclusion: Our findings suggest that small enhancement foci on MRI represent in-situ or invasive cancer foci and that MRI is highly sensitive for their detection. MRI could be used to determine the clinical significance of unresected cancer foci in a future prospective study.

320

POSTER

Prediction of axillary lymphatic node status in primary breast cancer – Comparison between positron emission tomography (PET) and sentinel-node biopsy

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Purpose: Axillary lymphatic node status is still the most important prognostic factor in patients with primary breast cancer. Early detection of small tumors has led to increasing numbers of lymph-nodes without malignant cells. So axillary lymphnode dissection is primarily a staging procedure. Because axillary lymphnode dissection is associated with high morbidity, noninvasive or minimal-invasive staging methods are required.

Methods: In 24 patients with suspicious lesions of the breast in clinical examination and/or mammography [¹⁸F-2-deoxy-2-fluoro-D-glucose (FDG) PET was performed preoperatively. Intraoperatively we injected lymphazurin-blu peritumorally to detect and resect selectively the sentinel-lymph-node before completion of the axillary lymphnode dissection.

Results: For detecting axillary lymph-node metastases we found a sensitivity of 63% with FDG-PET (specificity of nearly 100%) compared with a

sensitivity of 86% by the sentinel-node-technique (detection rate of 63%). The negative predictive value for FDG-PET was 84% and for sentinel-node-technique 89%. In 2 of the 3 false-negative results of FDG-PET we detected positive sentinel-nodes. The only false-negative sentinel-node was obtained in a patient with one large (3 cm), just macroscopic certain metastatic infiltrated lymph-node. In this patient the FDG-PET predicted axillary lymph-node metastases.

Conclusion: The negative predictive value of FDG-PET and sentinel-node-technique was found to be rather high (84 versus 89%). It has to be proved in further controlled prospective studies whether the predictive value for staging the axillary lymph-node status can be improved by combination of these two techniques. Patients with negative PET and negative sentinel-node probably have such a low risk for axillary lymph-node metastases, that complete axillary dissection can be avoided.

321

POSTER

The value of high-frequency ultrasound guided core-cut biopsy of breast tumors

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Purpose: Individual therapeutic management on behalf of physical integrity and lifequality requires valid and reliable diagnosis of breast tumors. Fast technological developments in ultrasound made it a major tool in complementary diagnosis of breast lesions. We examined high-frequency guided core-cut biopsy in terms of diagnostic yield and accuracy in detecting breast cancer.

Methods: High-frequency ultrasound (10/13 MHz) guided 16-gauge needle biopsy was performed in 231 cases of breast lesions. Three tissue samples of each lesion were taken. All lesions were subsequently surgical excised, 199 were malignant and 32 benign.

Results: 16-gauge needle biopsy provided adequate amount and quality of tissue specimens for histopathologic diagnosis and for prognostic parameters. 191 breast neoplasms and 32 benign lesions were correctly diagnosed. Sensitivity was 95.9%, negative predictive value was 80.0%, specificity and positive predictive value was 100%. The overall accuracy was 96.5%. 5 of 8 false negative cases showed fibrous tissue.

Conclusion: High-frequency ultrasound guided core-cut biopsy is a valid interventional method of diagnosing malignancy under controlled circumstances. In case of discrepancies of histopathologic findings and dignity judgement of complementary diagnosis of breast lesions in particular revealing fibrous tissue-open biopsy is recommended.

322

POSTER

The value of electron beam computed tomography in the analysis of breast lesions and lymphnode metastasis

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Purpose: To differentiate between benign and malignant breast lesions and to evaluate axillary-, supraclavicular-, internal mammary artery- and mediastinal lymphnodes.

Methods: Patients with mammographically verified breast lesions were studied with Electron Beam Computertomography (Siemens Evolution, Imatron software). After initial localisation of the lesion with a volume scan and evaluation of the circulation time a perfusion study at the level of the lesion was performed (50 ml Ultravist 370, Schering), thereafter a post bolus study was made. Perfusion analysis of the lesion and the normal parenchyma was performed using special software for time density analysis (Imatron). Regional lymphnodes were evaluated from the volume scans. All the studied lesions were finally histologically examined.

Results: 63 patients were studied. In 45 patients perfusion and morphological appearance were highly indicative of malignancy and were histologically verified. In one patient perfusion and morphology were not typical of malignancy but compared to the normal parenchyma perfusion was increased and histologically verified as malignant. In two patients perfusion looked benign but were histologically verified as malignant. In one patient the lesion was suspected to be an intra-mammary lymphnode, this was also histologically confirmed. In 15 patients perfusion and morphology appeared benign, histologically verified in all 15 patients. Furthermore, in 23 of the 63 patients metastases in axillary lymphnodes were highly suspected, positive in 15 patients (65.2%), false positive in 8 patients (34.8%). In 23 patients axillary lymphnodes were negative. None of the axillary lymphnodes were