2120 POSTER

Ultrasound dopplerography in the treatment monitoring of patients with sarcomas

H. Matyusupov[1], L. Koren[1], R. Alimov[1], M. Ismailova[1], A. Ososkov[1].
[1]*National Research Center of Oncology, Radiology, Tashkent, Uzbekistan*

Background: The aim of the research was to improve the results of complex ray diagnostics and monitoring in the treatment stages of patients with malignant neoplasms of soft tissues and bones using ultrasound dopplerography (US-dopplerography).
Materials and Methods: US-dopplerography data in 38 patients with tumors of soft tissues and bone tumors with infiltrated soft tissues are studied in the course of treatment. The following criteria were investigated by dopplerography: arterio-venous blood-flow, venous blood-flow, maximal velocity (V_{max}) of blood, minimal velocity (V_{min}) of blood, index of resistance (IR), pulse index (PI).
Results: In 7of 38 patients US-dopplerography was performed repeatedly in dynamics. In 2 patients with fibrosarcoma character of neoplasm tissue blood-flow changed: in 1 patient after combined chemo- and ray-therapy neoplasm tissue blood-flow was not registered practically, in the 2nd patient indices of blood-flow decreased after chemotherapy. In 8 patients presented with fibrosarcoma blood-flow was not detected in the structure of neoplasm, and in 3 patients with the same diagnosis moderate peripheral blood-flow in the neoplasm was revealed. In one patient with osteosarcoma parameters of blood-flow in soft tissues infiltration were not changed even after 4 courses of chemotherapy. In the second patient parameters of blood-flow increased after 1st course of chemotherapy treatment, and after 3rd course blood-flow in the damaged area practically could not be detected. In 2 patients, presented with neuroblastoma and Khodjkin's lymphoma, parameters of blood-flow decreased until complete disappearance after 2 courses of chemotherapy. In one patient with rhabdomyosarcoma blood-flow indices did not actually change in the process of treatment.
Conclusion: Parameters of US-dopplerography in dynamic control can serve as an indicator in the treatment efficacy assessment in patients with soft tissue and bone tumors.

2121 POSTER

Colorectal cancer liver metastases treated with target therapies: monitoring response with contrast-enhanced ultrasonography (CE-US)

R. De Sanctis[1], S. Quadrini[1], G. Stumbo[1], B. Gori[1], E. Del Signore[1], D. Adua[1], F. Recine[1], L. De Filippis[1], F. Longo[1], M. Di Seri[1]. [1]*Policlinico Umberto I – Roma, Oncologia Medica A, Roma, Italy*

Background: Since anti-angiogenic treatment induces necrosis with no change in the volume of the tumor, new imaging technologies are particularly suitable for the early assessment of the response, for which the RECIST size criteria appear inappropriate. CE-US has recently been proposed for evaluating therapeutic response, demonstrating changes in tumor parenchymal perfusion and emergence of necrosis with no change in tumor volume. The aim of the study was to compare CE-US and CT (the gold standard) in assessing therapeutic response to antiangiogenic-based therapies for liver metastases from colorectal cancer.
Patients and Methods: Both CE-US and CT were used to prospectively evaluate 48 hepatic lesions in 21 patients (male 13, female 8; age range 44−78 years, mean 58.2 years) with colorectal adenocarcinoma receiving antiangiogenic therapy since January 2008 through February 2009. CE-US was performed the day before (day −1) starting target therapy (bevacizumab or cetuximab) and at days 28 and 90. The percentage of contrast uptake (Sonovue) before treatment and at follow-up was evaluated, thus rating all patients as responders or poor/non-responders. Re-evaluation total-body CT scan was performed at 90 days.
Results: Based on RECIST criteria, at the CT scan, 7/21 patients demonstrated stable disease (SD), 8/21 had partial response (PR) and 6/21 showed progressive disease (PD). When assessed by CE-US, 16 patients (33 lesions) were considered good responders and 5 patients (15 lesions) poor or non-responders. Of note, 4/7 patients with SD (57%) were categorized as good responder when evaluated by CE-US. A good response at CE-US preceded PR based in 5/8 patients by 2 months. Of the 6 patients characterized with PD, 4/6 (66.6%) demonstrated a corresponding lack of decrease in tumor contrast enhancement within the tumor.
Conclusion: In patients treated with anti-angiogenic drugs, CE-US identifies more good-responder patients compared with RECIST at an earlier time-point. When monitoring tumor response in patients treated with anti-angiogenic therapy, CE-US might need to be added to CT scan at different time of follow-up.

2122 POSTER

Measurements of malignancy signs by atomic force microscopy

S. Sukharev[1], I.V. Reshetov[1], V.I. Chissov[1], N.N. Volchenko[1], E.N. Slavnova[1], V.A. Bykov[2]. [1]*P.A. Hertzen Cancer Research Institute, Microsurgery, Moscow, Russian Federation;* [2]*NT MDT, Management, Moscow, Russian Federation*

Background: In present work Atomie Force Microscopy (AFM) has been used for searching signs of malignancy in cytological specimens prepared identically to those used in traditional cytological studies, while most of earlier investigations have studied specimens prepared by complex techniques like attaching ligands to AFM tips, design of hybrid cell/polyelectrolyte systems, taking measures in fluids and so on which are unusual for ordinary hospitals.
Material and Methods: Diagnostic procedures: Fine-Needle Aspiration Cytology/Biopsy (FNAC/FNAB) and Imprint Cytology Smears. All specimens were investigated by AFM (NTEGRA Prima, NT-MDT Co., Russia). AFM images were treated with different Image analyses functions like filtering, flatten correction, equalization, statistics.
Results: Signs of Malignancy and premalignant lesions:
1. The visible measurable nucleoli in all cancer specimens.
2. Intranuclear Cytoplasmic Inclusions (INCI) in thyroid papillary carcinoma. We managed to measure those inclusions – the depth is about 600 nm.
3. The Presence of koilocytes. Presence of koilocytes is one of known signs of virus lesion. Koilocytes have halo nuclei on cytologic examination. Morphologic appearance of halo is perinuclear groove about 200 nm depth.
4. Evaluation of the immunocytochemical reaction's intensity. AFM-images of Her2/neu overexpressed specimens demonstrate a packing of the membrane of tumor cells. The estimation of the intensity of immunocytochemical reaction is possible according to the height of the painted membrane.
5. Alteration of nuclear:cytoplasmic ratio and shapes of nuclei.

Tissue	Cytoplasm height (nm)	Nucl. height (nm)	Ratio Nucl. height/ Cytoplasm height	Presence of nucleoli
Breast cancer	1000	1150–1200	1.15−1.2	Visible nucleoli 250–300 nm in cancer cells, irregular shape of nucleus
Fibroadenoma of the breast	200	500	2.5	
Papillary thyroid carcinoma	700	1300	1.8	Visible nucleoli 150–200 nm in cancer cells, irregular shape of nucleus, nuclear enlargement. Presence of INCI) – the depth is about 600 nm.
Intact thyroid gland	400	700	1.7	
Normal epithelium	200	1050	5.5	
Cervical cancer	1000	2000	2	Visible nucleoli 500–600 nm
Virus lesion (Koylocytes)	200	600–800 Perinucl. groove 200 nm		

Conclusions: AFM is capable of distinguishing tumor cells in vitro on actual cytological samples.
The preparation of samples is quite simple and may exercised in ordinary hospitals, which should accelerate the adaptation of nanotechnology tools (AFM) into everyday medical practice.

2123 POSTER

Expression of solute carrier genes related to molecular imaging in breast cancer

M. Jarzab[1], J. Zebracka[2], M. Kowalska[2], B. Lange[3], M. Dobrut[4], R. Szumniak[4], E. Stobiecka[5], A. Czarniecka[4], M. Kalemba[2], B. Jarzab[2]. [1]*Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology, Department of Clinical and Experimental Oncology Dept. of Tumor Biology, Gliwice, Poland;* [2]*Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology, Department of Nuclear Medicine and Endocrine Oncology, Gliwice, Poland;* [3]*Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology, Department of Radiotherapy, Gliwice, Poland;* [4]*Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology, Department of Oncological Surgery, Gliwice, Poland;* [5]*Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology, Department of Tumor Pathology, Gliwice, Poland*

Molecular imaging of cancer relies on specific cellular mechanisms, operating differently in various tumor types. Positron emission tomography (PET) is a powerful method to detect focal tracer uptake in breast cancer