New treatments based on antiangiogenic substances are developed in order to destroy tumor vessels and are the object of promising clinical research for cancer treatment. Considering the large number of new targeted drugs under development, there is a great need for early reliable imaging indicators of tumour responses, and identification of a recommended modality of drug administration to guide further steps in the clinical development. The response rate remains the best objective parameter of efficacy of the treatments tested in Phase 1 2, or 3 but this parameter is obtained very late in the clinical development, while the effect on the tumour must be determined as soon as possible in order to optimise the schedule and the dose to be recommended for the late clinical development stage. The early functional evaluation of new treatments is a main goal.

At present, technical advances in DCE-ultrasonography using bolus contrast agent (SonoVue®, Bracco) and perfusion software (Aplio, VRI, Toshiba) allow the detection of microvascularization and perfusion for superficial and deep malignant tumors. Thus, it becomes possible to early evaluate the efficiency of antiangiogenic or anti-vascular molecules. Treatment response can be early predicted according to modifications of this vascularization before any volume modification. The acquisition of raw linear data affords the precise quantification (peak intensity, time to peak intensity, slope of wash-in, area under the curve…) of the perfusion after contrast uptake curves modelization (CHI-Q, Toshiba), in particularly using time tracking of region of interest. Our results will be focused on GIST, RCC, HCC, and melanoma with different molecules performed in our institution including 117 patients and confirmed with the multi-centric study including 20 centers in France presented in the RSNA 2009 (401 patients)


6. French Multicentric Prospective Evaluation of Dynamic Contrast-enhanced Ultrasound (DCE-US) for the Evaluation of Antiangiogenic Treatments. N B Lassau, MD, PhD, Villejuif, FRA; J Lacroix, MD; R Aziza; V Vilgrain, MD; S Taieb, MD; S Koscielny . RSNA 2009

7. Methodological Study to Assess the Evolution of the Quality of Dynamic Contrast-enhanced Ultrasound in a Large National Multicentric StudyJ Pellier, Villejuif, FRANCE; J Chevalier, MSC; S Koscielny; J Bonastre, DSc, MSC; B Benatsou; N B Lassau, MD, PhD. RSNA 2009

8. Dynamic Contrast-enhanced Ultrasound with Quantification to Assess Targeted Treatment Efficacy: Results of a Multi-centric Prospective Cost Study. J Bonastre, DSc, MSC, Villejuif, FRANCE; J Chevalier, MSC; J Pellier; B Benatsou; S Koscielny; N B Lassau, MD, PhD. RSNA 2009

Illustration:

Fig 1: Patient with pelvic metastasis from GIST treated by an inhibitor of thysosine kinase in phase 2. The evaluations were performed before treatment, and at Day 7, 14 and 1 Month. The graph shows the corresponding contrast uptake curves from the raw linear data.
After 1 month