Multi-modality Oncology Workflow for Comprehensive Follow-up and Treatment

Acquisition Protocol	
Scanner:	LightSpeed VCT
Scan type/slice thickness:	Helical 1.25 mm
Pitch:	1.375
Rotation time:	0.6
mAs:	338
kV:	120

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Abstract

OncoQuant has proved to be an invaluable tool for tracking of oncology studies in our facility. We can compare a seemingly limitless number of CT, MR, and PET exams. Moreover, OncoQuant provides a structured workflow for using base lining and NADIR to determine patient response to treatment according to RECIST guidelines.

Patient history

The patient is a 47-year-old male with liver metastases of an endocrine tumor in the pancreas. Palliative treatment: first line chemotherapy in December, 2006.

Software

- Dexus workflow software(s) used: OncoQuant
- Length of time used at site: 1 year, used routinely (daily)
- Platform used (Wkst/Server): AW workstation

Patient findings

The patient returned for evaluation in December, 2010. There was a partial response to treatment followed by progression, and the NADIR was set to the date with the best response to treatment as per RECIST guidelines.

The summary table was used to assess the percentage of disease progression from NADIR (Figure 1).

If the calculation is made from the original baseline, the tumor growth since December, 2006 is 11% (Figure 2). But it is important to consider that the gold standard is NADIR according to RECIST guidelines. Using the RECIST methodology, the October, 2009 review becomes the new reference (NADIR) from which the progression of the disease should be evaluated. Using the summary table in Figure 1, we can clearly see that there is an evolution of 73% of the lesions based upon the RECIST 1.1 criteria (total of Dmax of the initially identified target lesions). This indicates there is a progression of the tumor, and, therefore, a need to change patient treatment.

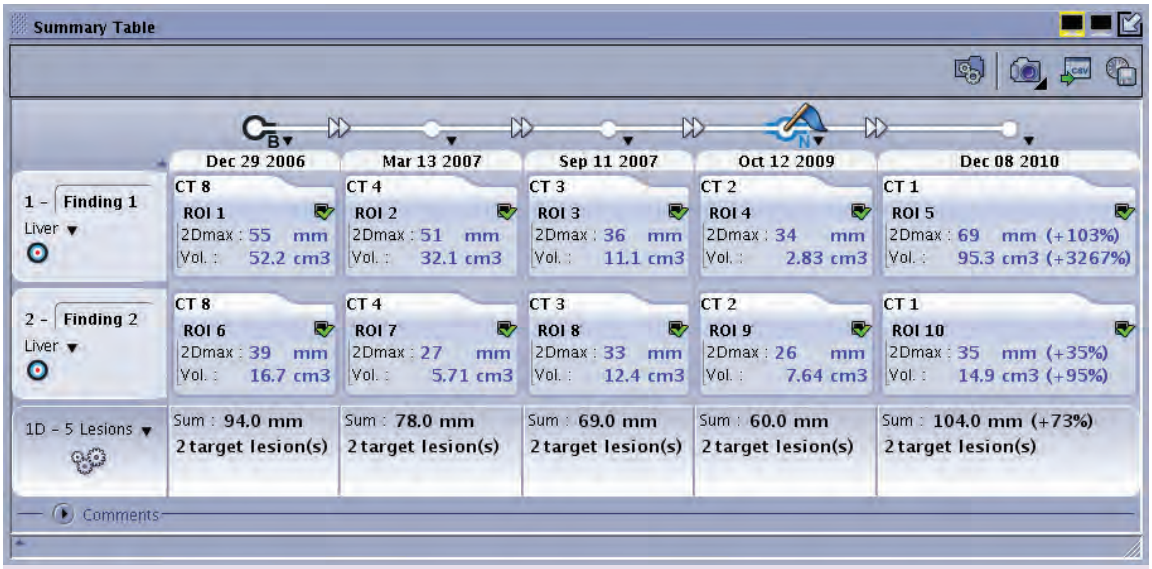

Figure 1. Summary Table

Discussion

There are relative inconsistencies with the planning of treatment and follow-up of oncology cases between different sites and even between oncologists at the same hospital. Although the results are directionally correct, repeatability and reproducibility are often challenges when it comes to comparative results.

With OncoQuant, we were able to establish a consistent, repeatable, and rapid diagnostic workflow across different cases and physicians, even utilizing exams from several years prior as a baseline. We came to find that through this workflow, we were able to achieve:

- Quick comparison of follow-up exams from the baseline exam;
- Comparison of several exams without virtually any apparent limit;
- Cross registration of chosen target lesions from lesions in the initial exam;
- Comparison of measurements obtained with an automatic registration between the initial exam and follow-up exam;

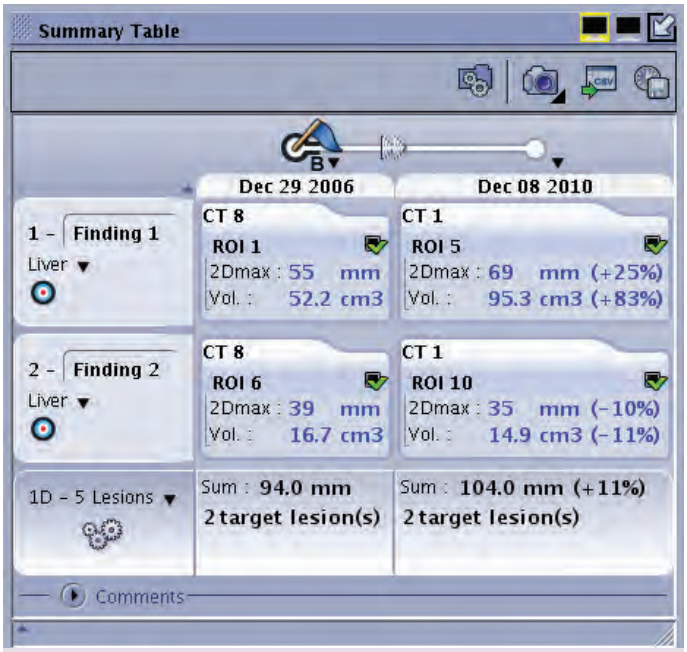

Figure 2. Reference of current to the baseline.

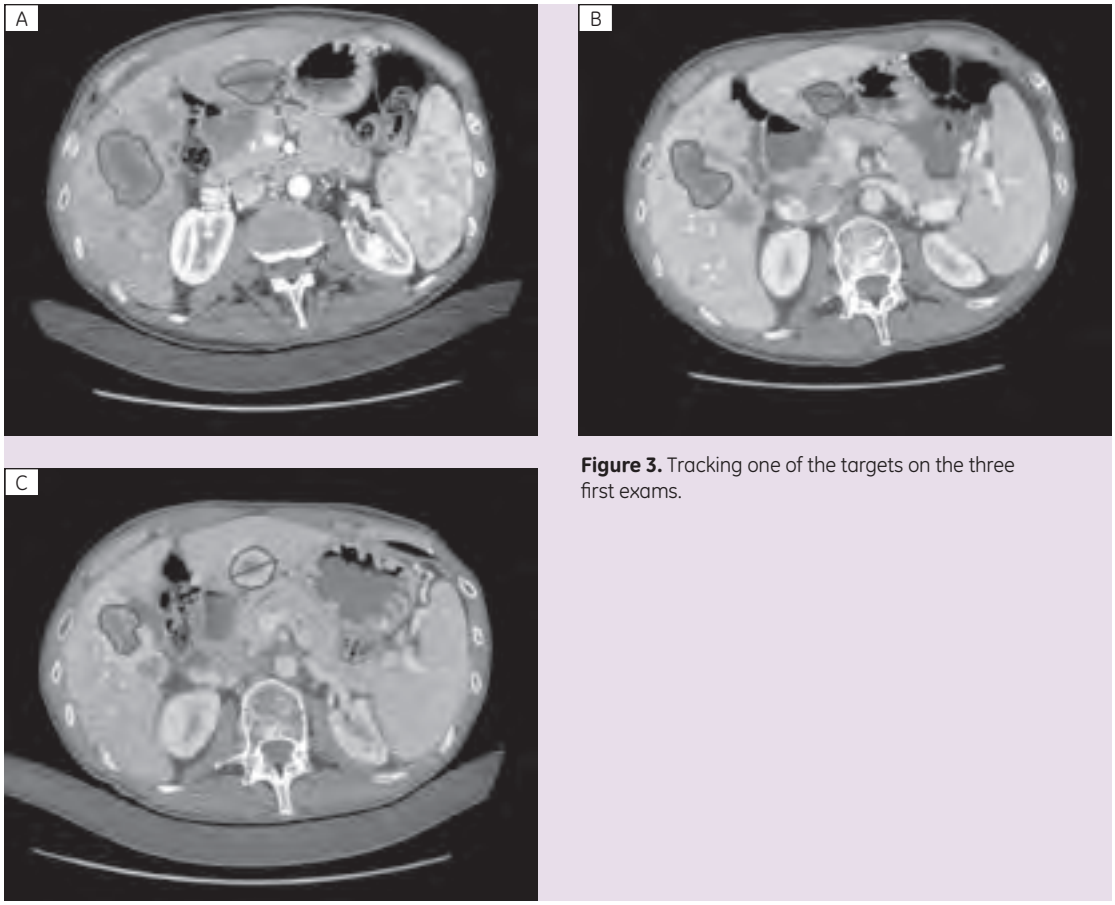

Figure 3. Tracking one of the targets on the three first exams.

- Consistent results that are table and operator independent;
- Clinical answers that are less tedious to perform and more objective and independent of the modality, acquisition technique, and clinician;
- Automatic registration of either two or three different modalities;
- Comparison of parametric data, diffusion, perfusion curves, and SUV integration of different morphological criteria: RECIST 1.1 (standard), RECIST 1.0, WHO, and any other configured/ user defined criteria; and
- Monitoring of volume evolution even if not stated in the RECIST guidelines.

Overall, OncoQuant provides a structured and repeatable workflow that improves the speed and efficiency of follow-up reviews and creates a method to initiate a standardized dialogue between several physicians in our network. ■

Valérie Laurent, MD, PhD, is a radiologist at the Central University Hospital, Nancy (Nancy-Brabois, France). Dr. Laurent has spent over 12 years focusing on abdominal imaging in oncology and during that time has used MRI and CT extensively. She recently received her doctorate degree in 2010.

The Central University Hospital of Nancy comprises a hospital network of over 1,600 beds serving over 600,000 patients with 30,000 emergency entries a year. There are two main locations: one in the center of Nancy and the other in the suburbs of Brabois.

Inaugurated in 1973, the Hospital Brabois for Adult Studies is the cornerstone of the Brabois hospital network serving first as a university hospital within close proximity to the Faculty of Medicine and secondly as the premier regional center for combating cancer with over 945 beds.