Case 6
Perfusion CT to Follow up Patient with Bronchial Carcinoma

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HISTORY

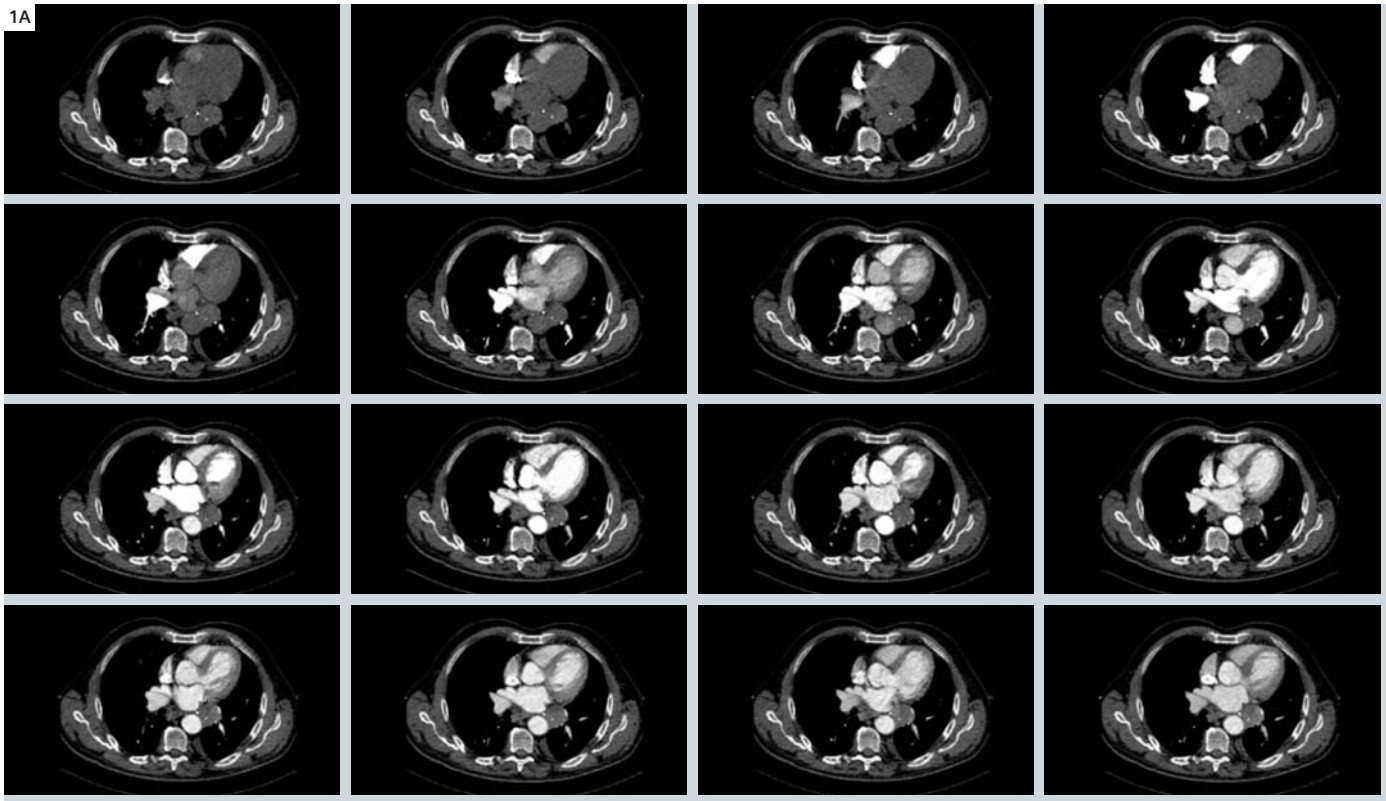
A 67-year-old male with squamous cell carcinoma of the lung, initial stage T3N3M0 was referred to a follow-up examination after radio-chemotherapy.

DIAGNOSIS

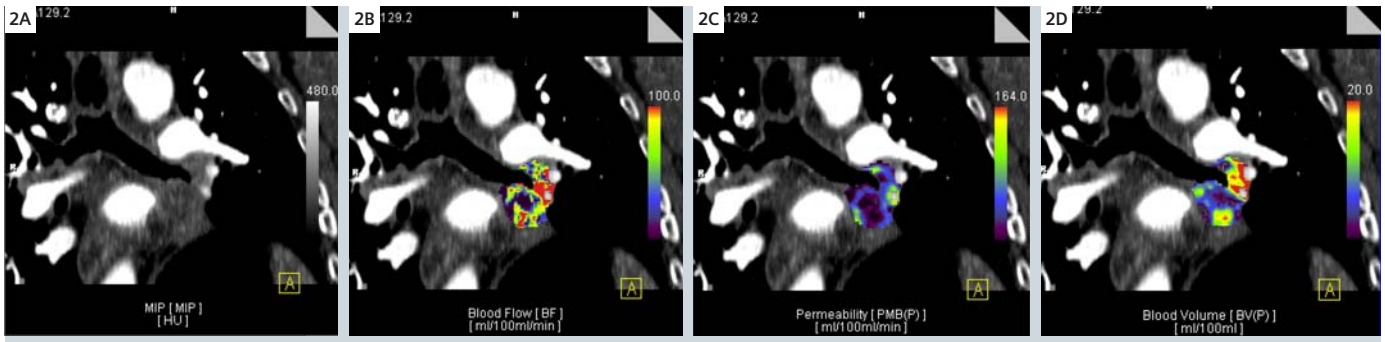
To differentiate between scar and viable tumor tissue, Perfusion CT was performed. It revealed increased blood flow, blood volume and permeability in the tumor tissue. Although measurable volume reduction of the tumor as well as lymph node metastases (>50%) was evident, CTP indicated viable residual tumor.

COMMENTS

An objective, reproducible, and non-invasive method for evaluation of tumors is offered by Perfusion CT. It has been demonstrated to be a useful tool in monitoring tumor response to cytotoxic and chemo-radiotherapy (Makari Y, Journal of Surgical Oncology 2007; Hakime A, Radiology 2007; Bellomi M,



1 Set of axial (Fig. 1A) and coronal (Fig. 1B) images showing time resolved contrast enhancement of the great mediastinal vessels, the heart, and the tumor.



2 Perfusion plots (MIP, blood flow, blood volume, and permeability surface area product) of the bronchial carcinoma show elevated perfusion parameters at the periphery of the lesion, using *syngo* Volume Perfusion CT-Body (Figs. 2A-2D).

Radiology 2007). Now with the SOMATOM Definition AS+ perfusion imaging is no longer limited to a scan range equivalent to the detector width. This increased scan range is beneficial to assess whole organs or larger tumors or the combination of primary tumor and lymph node metastases.

EXAMINATION PROTOCOL

Scanner	*SOMATOM Definition AS+*		
Scan area	*Thorax*	***Slice width***	*0.75 mm*
Scan direction	*Adaptive 4D Spiral*	***Reconstruction increment***	*0.5 mm*
Tube voltage	*100 kV*	***Reconstruction kernel***	*B 20*
Tube current	*150 eff. mAs*	***Contrast***	
Rotation time	*0.3 s*	***Volume***	*60 ml*
Spatial resolution	*0.33 mm*	***Flow rate***	*5 ml/s*
Slice collimation	*128 x 0.6 mm*	***Start delay***	*5 s*