DIFFUSION-WEIGHTED IMAGING OF RETROPERITONEAL FIBROSIS AND RETROPERITONEAL LYMPHOMA: CAN APPARENT DIFFUSION COEFFICIENT VALUES DISTINGUISH THE TWO?

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Introduction: The differentiation of retroperitoneal lymphoma and retroperitoneal fibrosis (RPF) on cross sectional imaging can be challenging. The most common distinguishing imaging features include morphology, adjacent lymph nodes, and effect on adjacent structures, which can be subtle and often nonspecific. Differences in signal characteristics at MR imaging such as a lower T1 signal in RPF has been shown. However, signal characteristics as well have been shown to vary depending on stage of retroperitoneal fibrosis, classically being more heterogeneous to hyperintense on T2 during more active phases and more hypointense on T2 during more chronic phases. Diffusion-weighted imaging (DWI) has been used for improved detection and characterization of retroperitoneal masses. However, using the apparent diffusion coefficient (ADC) value obtained from DWI has not been investigated for distinguishing between these two entities in particular to our knowledge. The purpose of our study was to assess whether or not ADC values can be used to distinguish RPF and lymphoma.[1-3]

Methods: Our institutional databases were searched to identify patients with histopathologically confirmed lymphoma and RPF who underwent MRI at 1.5T including DWI with b-values of 0, 400, and 800 s/mm^2 between December 2007 and August 2010. 27 patients, including 16 with lymphoma and 11 with RPF (M=11, F=16; mean age 63.3) were studied. Two independently measured ADC values for each region of pathology by placing an ROI centrally within the lesion on ADC maps. To minimize sample error, all ADC values obtained from the independent reads were averaged for each case. Then these values were compared for lymphoma and RPF by independent sample t-test.
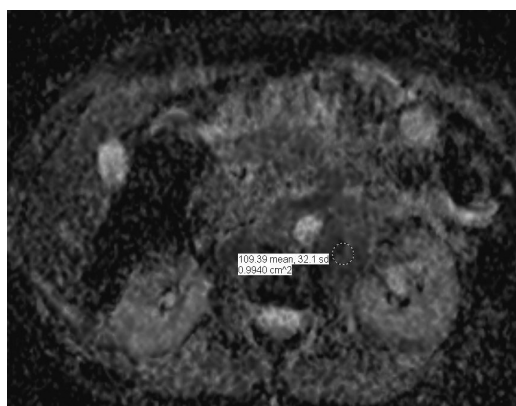

Figure 1

Figure 2

Figure1: 46 year old female with active RPF- ADC 1.03 *10^{-3} mm^2/s, measured just above the abdominal aortic bifurcation.

Figure 2: 64 year old female with low grade follicular lymphoma - ADC 1.09 *10^{-3} mm^2/s, measured in the left paraaortic region.

Results: There was no significant difference in mean ADC between lymphoma (1.26 *$10^{-3}$$mm^2$/s, range 0.54-2.03 *$10^{-3}$$mm^2$/s) and RPF (1.35 *$10^{-3}$$mm^2$/s, range 0.61-2.45 *$10^{-3}$$mm^2$/s), (p=0.57).

Histograms showing ADC values for lymphoma (Left) and RPF (Right).
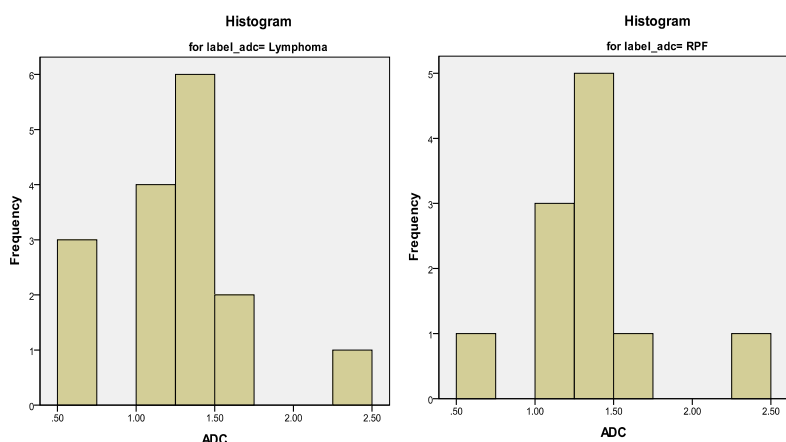
Group Statistics

		N	Mean	Std. Deviation	Std. Error Mean
ADC	Lymphoma	16	1.2581	.43274	.10819
	RPF	11	1.3545	.41673	.12565

Conclusions: Mean ADC measured with DWI using b-values of 0, 400, and 800 s/mm^2 cannot be used to distinguish retroperitoneal lymphoma versus RPF.

References:
[1] Nakayama T et al. J. Magn. Reson. Imaging 2004;20:735–742.
[2] Anis M et al. Radiol Clin North Am 2008; 46(2):265-85.
[3] Brooks A et al. British Journal of Radiology 1990;63:842-844.