Evaluation of mesenteric changes with elastosonography and diffusion-weighted magnetic resonance imaging in patients with Crohn's Disease: preliminary results.

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Aims and objectives

Magnetic resonance enterography (MRE) provides information in the study of Crohn's disease (CD) and requires gadolinium injection. Through the MR images it is possible to identify the main features of the disease such as the involvement of the bowel wall, and the involvement of the near structures, especially the mesentery [1-7]. In particular, MRE allows the hypertense signal of mesentery in the case of inflammation or hypointense in the case of fibrosis.
Even the elastography (USE) maybe can distinguish the change of fibrotic and edematous mesentery of patients with (CD).

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The aim of this study is focused to evaluate the diagnostic performance of USE and the apparent diffusion coefficient (ADC) in differentiating fibrotic and oedematous change of mesentery of patients with CD.

Methods and materials

Twenty-one patients (12 male and 9 female) with mean age of 31,22 ± 8,44 with Crohn disease underwent magnetic resonance enterography and in the same time a real-time USE from July 2014 to August 2015, in our Department. All patients have a histological diagnosis of Crohn disease.

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The MR studies had been performed on two 1.5 Tesla superconducting device (Philips Medical Systems, Shelton, CT). Patients fasted for 6 h before the MRI examination. MR studies were realized with BBFEM2D sequence on the axial plane, T2 SPIR on axial and coronal planes, E-THRIVE before and after contrast medium injection (after 30-75-120 sec) on axial and coronal planes and DWI sequences on the axial plane. ADC values were calculated in the wall of terminal and normal ileum at b 500 and 800. ADC values were calculated in the mesentery of pathological ileum (study group) and of normal ileum (control group) selecting simultaneously images at b 0, 500 and 800 and were compared with the USE colour-images in the same location. These results were statistically analysed.

Results

In our experience there was a significant ($p<0,05$) restriction of the diffusion in 13 patients with CD in the active phase, in particular the mean ADC values for the fibrotic mesentery $2,80 \pm 0,33 \times 10^{-3}$, while the mean ADC values for oedematous mesentery: $2,20 \pm 0,41 \times 10^{-3}$.
In the study group, the USE colour-scale coding showed a colour change from blue to red in the fibrotic change of mesentery (see Figure 2-3), and blue-green in the oedematous change (see Figure 3), 8 and 13 patients respectively.

However, the difference between the control and the study group was still significant in our study.

Images for this section:

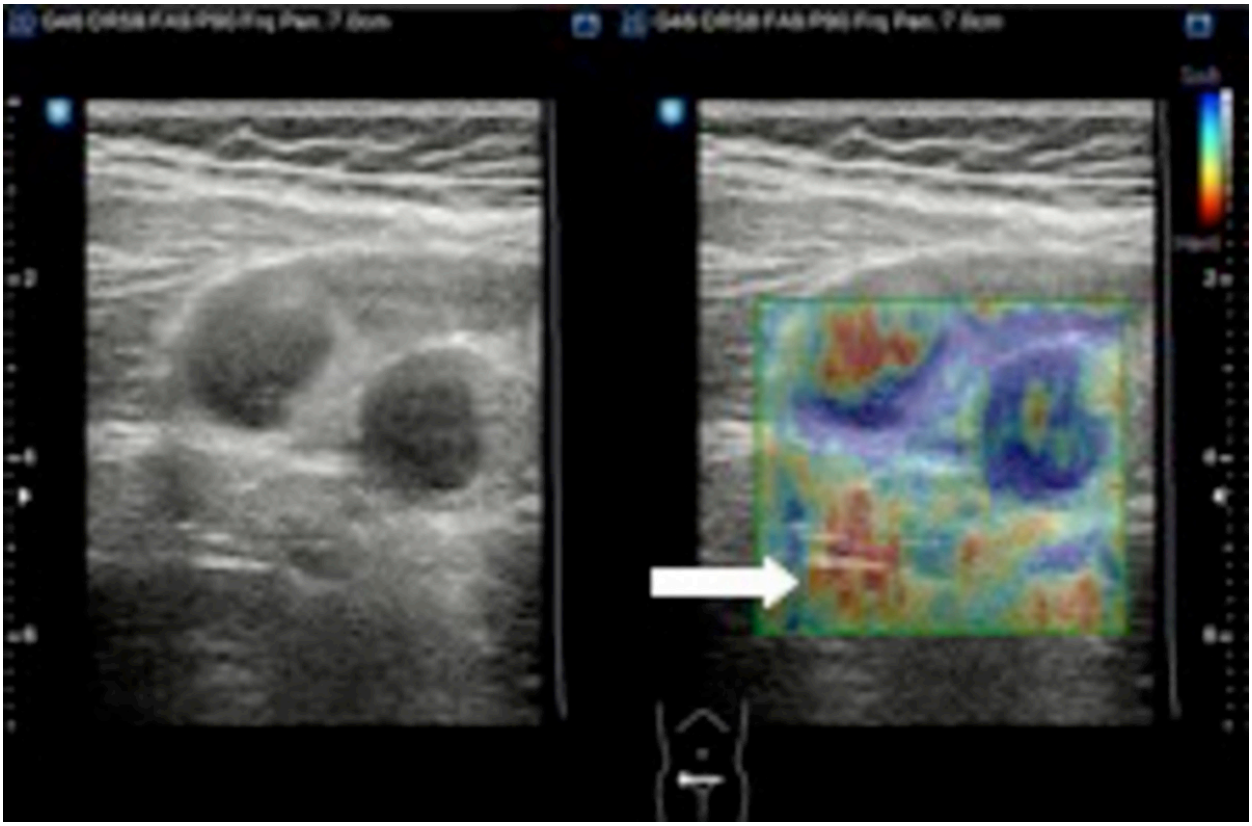

Fig. 1: Fibrotic change of mesentery.

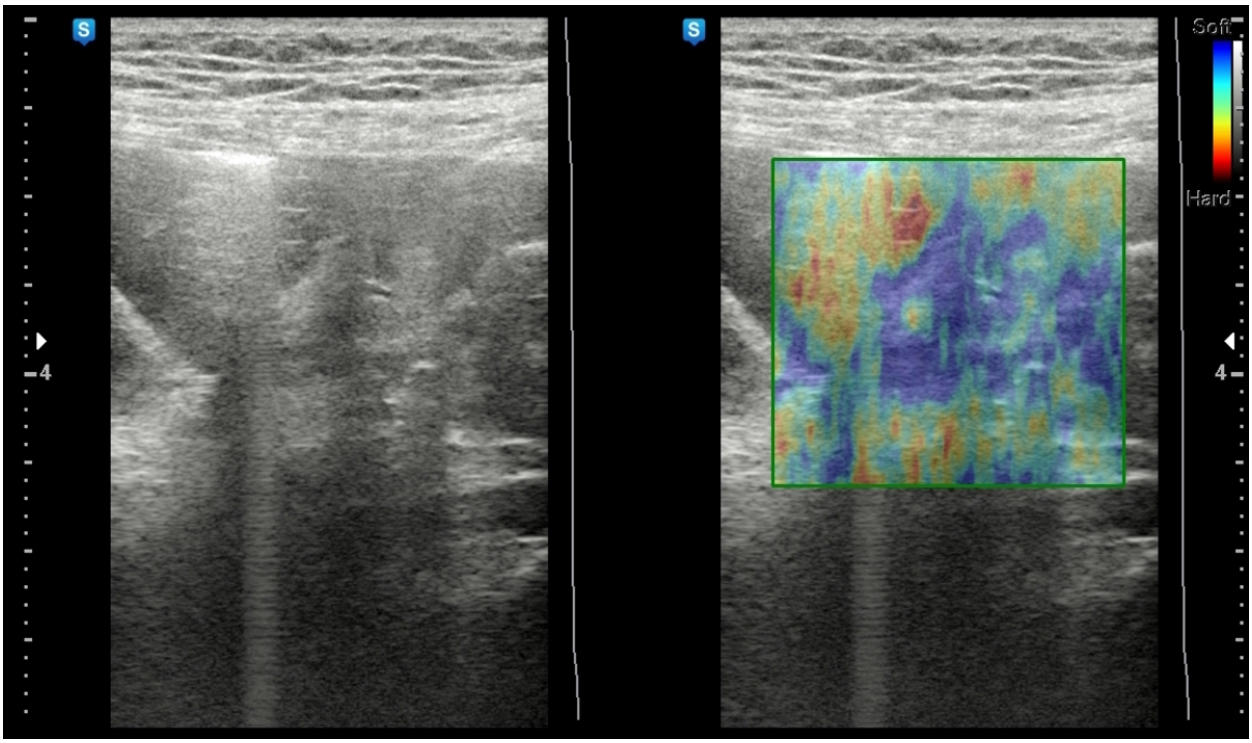

Fig. 2: Fibrotic change of mesentery.

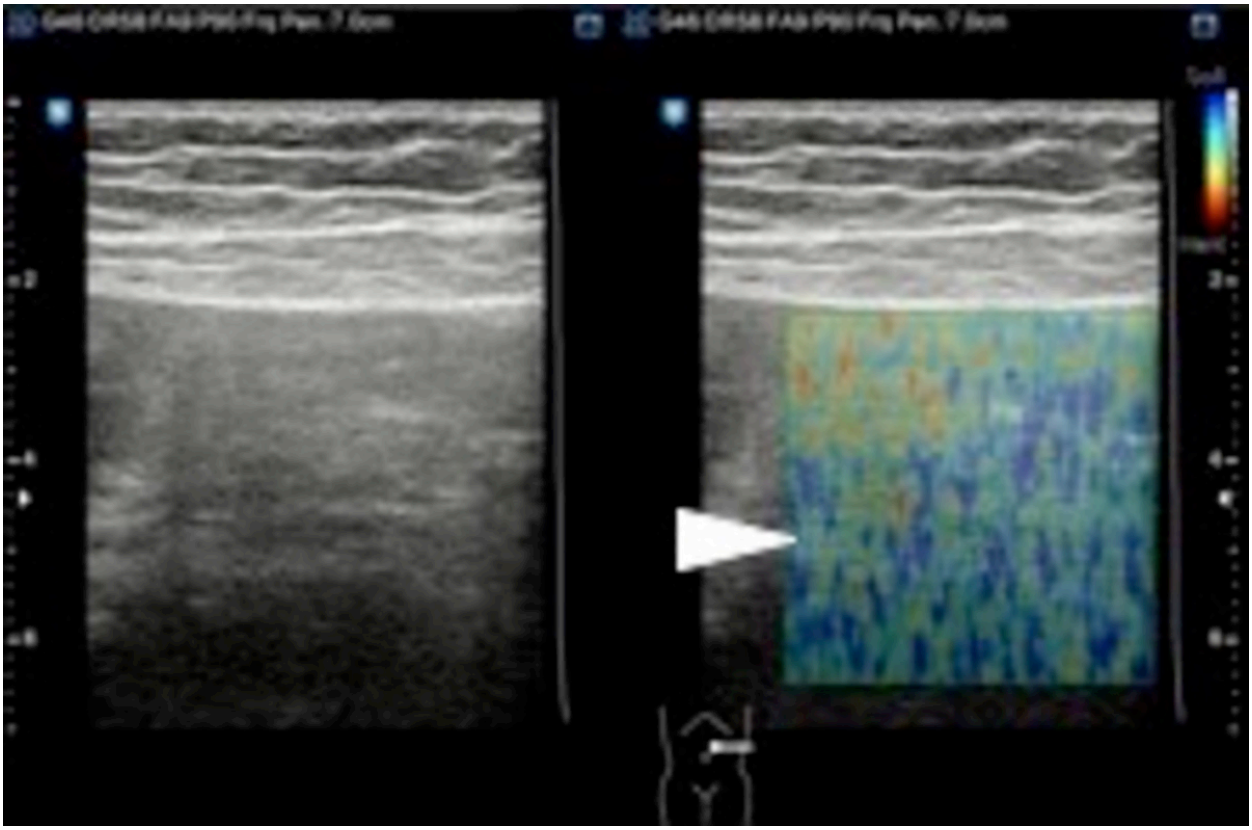

Fig. 3: Edematous change of mesentery.

Conclusion

Our results indicate that fibrotic and oedematous change of mesentery of patients with CD cause restricted diffusion and that DWI yields both qualitative (increased signal intensity) and quantitative (decreased ADC values) information that can be helpful in the evaluation of mesentery. USE also confirmed the nonsolid nature of the mesenteric mass because the tumor appeared almost entirely green (soft) on hardness colorimetric scale.
Evaluation of CD through USE and DWI is a more and more growing field, and many tools are available.

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