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Abstract

Intestinal perfusion measurements with CEUS and dynamic contrast enhanced MR enterography: A comparison study.

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Purpose

Objective measures of disease activity in Crohn's Disease (CD) are necessary. Change in perfusion is a potential biomarker for treatment response, however studies confirming robustness/applicability of perfusion techniques are lacking in CD.

Study aims: 1. Repeatability assessment for dynamic CEUS parameters measured within the thickened bowel wall of patients with active CD. 2. Comparison of these initial time intensity curve parameters with dynamic contrast enhanced MR enterography (DCE-MRE).

Methods

25 patients with moderate to severe CD underwent both DCE-MRE and CEUS within a week. SonoVue (2x2.4 ml) was injected before axial and longitudinal scans of the most inflamed bowel segment. CEUS was quantified with "Vuebox" (Bracco). Up to 4 regions of interests were drawn with size >0.1 cm². DCE-MRE using Gadolinium in a dynamic T1-sequence (VIBE), was analyzed using an in-house developed program. CEUS intensity data were log-converted before analysis and regression analysis and limits of agreement (LoA) were computed.

Results

CEUS was successfully performed in 24 patients; In 14 patients quality of fit >90% allowed comparison between scan planes. 95% LoA were -3.9 to 2.9 dB for peak enhancement, -2.2 to 0.9 s for rise time and -3.6 to 3.4 dB/s for wash-in rate. Comparing CEUS and DCE-MRE, statistically significant correlation was found for rise time ($p < 0.05$) and wash-in rate ($p < 0.01$), but not peak enhancement ($p = 0.175$).

Conclusion

CEUS has acceptable repeatability in active CD. The correlation CEUS and DCE-MRE suggests that CEUS could be a bedside alternative to MR in CD.



Rune Wilkens

CV

Rune Wilkens is currently a PhD student at Aarhus University, Health; Aarhus University hospital, GI department, Silkeborg regional hospital (RH), Diagnostic Centre. At the Centre of Clinical Ultrasound, Aarhus University, Health he is involved in pre- & postgraduate teaching in abdominal ultrasound, vascular access and lung ultrasound. At Aarhus University, Health he is involved in pre-graduate teaching in gastroenterology in faculty of medicine, case studies.

Prizes include winning the Young Investigator Award, Clinical Ultrasound WFUMB 2015 in addition to the EUROSON 2015 Young Investigator Award. Rune has 7 publications in peer reviewed journals and is a reviewer for BMJ Case Reports. Attending courses and congresses is an important part of his training and he has recorded 2500 abdominal ultrasound scans, 200 contrast enhanced ultrasounds and in endoscopy 70 colonoscopies, 40 gastroscopies, 30 sigmoidoscopies.

Rune's research and observerships have taken him to London, Canada and Germany for specific training in MR enterography, contrast enhanced ultrasound and intestinal ultrasound.