EuroSciCon

14th International Conference on

Gastro Education

September 06-07, 2018
London, UK

Carmen Cuffari, J Clin Gastroenterol Hepatol 2018, Volume 2
DOI: 10.21767/2575-7733-C2-004

CONTRAST ENHANCED ULTRASOUND: A NEW SAFE, BEDSIDE METHOD OF CHARACTERIZING ILEAL STRICTURES IN CHILDREN WITH CROHN'S DISEASE

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Background & Aim: In patients with Crohn's disease (CD) complicated by strictures of the terminal ileum, inflammation and fibrosis can both contribute to luminal narrowing and symptoms of intestinal obstruction. Conventional radiological imaging has not been shown to effectively delineate between inflammatory and fibrotic strictures. The ability to differentiate between reversible inflammation that may respond to optimized medical therapy and a predominantly fibrotic stricture that would necessitate surgical resection holds important clinical implications. CEUS is a novel, non-invasive, inexpensive, radiation-free and fast modality that provides a functional assessment of intestinal strictures. Our aim is to apply this new technology in patients with CD and to differentiate inflammatory from fibrotic strictures of the terminal ileum.

Methodology: CEUS was performed on fourteen pediatric patients with CD complicated by ileal strictures. Contrast enhancement (sulfur hexafluoride microbubbles) kinetics of the distal ileum were assessed, including wash-in slope, peak intensity, time to peak intensity and area under the curve. These quantifiable kinetics reflect the dynamic pattern of blood perfusion in the examined tissue. The same technique was also applied to healthy jejunal bowel, thus allowing each patient to act as their own internal control.

Results: In 10 patients with CD complicated by ileal strictures that required ileocecectomy, CEUS of the distal ileum revealed thickened submucosa, decreased peristalsis as well as lower wash-in slope, time to peak, and peak intensity; and area under the curve as compared to jejunal kinetics. These findings favored a predominately fibrotic stricture that correlated well with colonoscopy as well as an index score of fibrosis that was measured histologically. In 4 patients with CD presenting with abdominal pain and distension consistent with obstruction. CEUS of the distal ileum revealed a narrowed lumen, thickened submucosa, and decreased peristalsis, as well as increased wash-in slope, time to peak, peak intensity and area under the curve as compared to jejunal kinetics. In comparison to the patients with fibrotic strictures, the CEUS findings were more consistent with active inflammation rather than fibrosis. All of these patients responded well to further optimization of medical therapy.

Summary: CEUS is a non-invasive, inexpensive, radiation-free and fast mode of imaging that provides a functional assessment of ileal strictures, and a useful guide to medical and surgical therapy. Further prospective studies are needed to validate this new technology, and to better define the role of CEUS in patients with isolated colonic CD.

Biography

Carmen Cuffari is a pediatric gastroenterologist in Baltimore, Maryland and is affiliated with multiple hospitals in the area, including Greater Baltimore Medical Center and Howard County General Hospital. He received his medical degree from University of Ottawa Faculty of Medicine and has been in practice for more than 20 years.

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