Monthly research highlight: Fibrotic remodeling in Pediatric Eosinophilic Esophagitis

In response to chronic inflammation, the body’s tissues will alter or remodel its structure. This can lead to organ dysfunction and progressive symptoms or disease. In Eosinophilic Esophagitis (EoE), chronic inflammation leads to fibrosis and narrowing of the esophagus which can in turn lead to increased symptoms and need for esophageal dilation. Both children and adults are affected by fibrosis. The reasons why some patients are more significantly impacted by fibrosis compared to others is not entirely clear. One barrier to investigating the effects and mechanisms of fibrosis is that our ability to detect it in the clinical setting is limited. For example, evaluation by upper endoscopy often does not detect abnormal narrowing of the esophagus when compared to contrast esophagram. (Menard-Katcher C, Swerdlow MP, Mehta P, Furuta GT, Fenton LZ. Contribution of the esophagram to the evaluation of complicated pediatric eosinophilic esophagitis. J Pediatr Gastroenterol Nutr. 2015 Nov;61(5): 541-6.)

Through patient-oriented research studies we identify the role for advanced endoscopic assessment tools in the detection of fibrosis in children and adolescents with EoE and investigate molecular differences between patients with more severe fibrosis versus inflammatory characteristics. We detect the effects of treatment and other clinical factors on these endpoints.

What the study/science means to patients and the field

Eosinophilic Esophagitis (EoE) is a chronic allergen triggered inflammatory disease of the esophagus that has emerged as the most common cause of swallowing difficulty in children and adults. EoE leads to increased health care utilization and negatively impacts quality of life for many of our patients. With rapidly increasing prevalence, clinical phenotypes (or groups) have emerged including a fibrostenotic phenotype defined by significant narrowing of the esophagus (stricture). In this proposal we take advantage of endoscopic and molecular investigative tools to define in children needed markers for phenotype detection and to further identify potential mechanisms of disease. We hope this will lead to improved clinical care and future treatments.

Scientific investigator’s profile

Calies Menard-Katcher, MD, Assistant Professor, Department of Pediatrics, University of Colorado School of Medicine; Gastrointestinal Eosinophil Diseases Program, Digestive Health Institute, Children’s Hospital Colorado

Education: BA, Bryn Mawr College; MD, University of Pennsylvania Perelman School of Medicine; Pediatric Residency and Pediatric Gastroenterology Fellowship, Children's Hospital of Philadelphia.

Background: Dr. Menard-Katcher’s overall goal is to improve the lives and health of children with Eosinophilic GI Disease through improving and personalizing clinical care. Her interest in conducting patient-oriented research is motivated by this goal. A diverse and progressive clinical and research training led her to the University of Colorado and Children’s Hospital Colorado in 2012. Preceding her relocation to Colorado, she obtained research training in the laboratory of Dr. Joshua Friedman (University of Pennsylvania) where she studied the expression and role for microRNA in EoE. (Menard-Katcher C*, Zahm AM*, Benitez AJ, Tsoucas DM, Le Guen CL, Hand NJ, Friedman JR. Pediatric eosinophilic esophagitis is associated with changes in esophageal microRNAs. Am J Physiol Gastrointest Liver Physiol. 2014 Oct 15;307(8):G803-12. PMID: 25147232.) Research training now takes the form of Master’s level coursework in clinical research sciences at the University of Colorado. Dr. Menard-Katcher is currently funded by a Young Investigator Award through the North American Society for Pediatric Gastroenterology Hepatology and Nutrition. She is a
member of the American Gastroenterology Association, North American Society for Pediatric Gastroenterology, Hepatology and Nutrition, American College of Gastroenterology and the International Eosinophil Society and is a board certified pediatric gastroenterologist.

Summary research figure

**FIGURE:** Stricture is not always appreciated on endoscopy when compared with esophagram. In this patient, (A–B) esophagram detected short-segment mild stricture of the esophagus just below the thoracic inlet associated with smooth ring-like indentations (arrows). C, Endoscopy detected edema and mild trachealization but did not detect stricture; however, (D) upon dilation to 15 mm, there was a resultant mucosal split (Menard-Katcher C, Swerdlow MP, Mehta P, Furuta GT, Fenton LZ. Contribution of the esophagram to the evaluation of complicated pediatric eosinophilic esophagitis. J Pediatr Gastroenterol Nutr. 2015 Nov;61(5): 541-6).