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The role of endosonography (EUS) in evaluating pediatric eosinophilic esophagitis (EoE)

Introduction & Aim: EUS was initially employed to document esophageal thickening in pediatric EoE in a sentinel paper. Subsequently, it has been utilized to measure response to treatment in an adult with EoE. This report describes EUS data in a cohort of children with esophageal inflammation and highlights pitfalls and potential applications of this technology.

Methods: EUS was performed on 29 patients (21M:8F; 9m-20y) with either a previous diagnosis of known EoE {previous esophageal biopsy>15 eosinophils (eos)/hpf} or symptoms consistent with EoE. Exams were performed utilizing a 12 (earlier exams only) or 20 mHz ultrasound probe. Measurements were obtained for the mucosa, submucosa plus mucosa, and the total wall thickness at the distal (n=58) and mid (n=59) esophagus prior to obtaining biopsies.

Results: In this study, 13 of the 29 patients had multiple (2-6) examinations. 10 patients were found to have gastroesophageal (GER) or acid peptic disease and had a single exam. The remainder of the cohort was composed of: 24 exams during active EoE (defined as >15 eos/hpf after PPI therapy); 15 exams during EoE in remission (previously active EoE, presently with <15 eos/hpf); 5 exams on patients with active eosinophilic gastrointestinal disease EGID (EoE criteria plus either stomach or duodenum also had excessive, >30 eos/hpf); and 5 patients with EGID in remission (<15 eos/hpf in mid and distal esophagus and previous history of active EGID). Total wall thickness (TWT) in the mid (p=0.03 by 2 way ANOVA) and distal (p=0.007) esophagus was significantly decreased in the GER exams (1.5 mm and 1.5 mm) compared to the EoE active (1.9 mm and 2.1 mm) and remission (1.8 mm and 2.0 mm). The thickening was primarily attributed to the muscular layer and the sub-mucosa. While the TWT for the EoE active and remission were not statistically different, those patients with multiple exams demonstrated a downward trend with effective therapy. In the two patients with markedly increased TWT and active EoE who went into remission, mucosal eosinophilia (histologic remission) occurred more rapidly than reversal of wall thickening. 4 patients with previously diagnosed EoE were found on subsequent studies to have EGID. Although this preliminary cohort is small, the EGID TWT was comparable to the active EoE. For those with serial exams, EGIDs also demonstrated decreased TWT with standard EoE therapy.

Discussion: These results confirmed the previous preliminary studies that demonstrate EUS can assist in distinguishing GERD from EoE. Our preliminary findings indicated that in pediatric patients with EoE, esophageal TWT thickening appears to take longer to resolve than mucosal eosinophilia. Characterizing esophageal ultrasound abnormalities based on histopathological criteria can therefore yield a confusing picture. Conversely, recognizing esophageal wall thickening as an important clinical end point may provide a more appropriate basis for making clinical decisions and understanding the pathophysiology of this disease.

Biography

Simon S Rabinowitz has received his PhD from UW Madison and his MD from University of Miami in 1983. He completed his Pediatrics and GI Training at Mount Sinai Health System, NY. He founded the Pediatric Gastroenterology division at Downstate Children's Hospital in 1989. In 2003, he became the Chairman of Pediatrics and the Program Director at St. Vincent's Hospital, Staten Island. He has recently published on Hirschsprung's disease and *Helicobacter pylori* but his main interest lies in translational studies of Eosinophilic Esophagitis.

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