Esophageal diseases

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At Digestive Disease Week (DDW) this year (3–6 May, Chicago, Illinois), investigators gathered from around the world to share discoveries and experience in esophageal diseases. Presentations ranged from advances in endoscopic techniques to noninvasive disease stratification and results from long-term cohort studies. This review discusses results from seven seminal studies in esophageal diseases reported at DDW. Although this work is impressive in its scope and potential for clinical impact, selection of these studies as the "most important" is admittedly somewhat arbitrary, as numerous centers contributed a wealth of new information. With that caveat, below we present our review of the most notable abstracts in esophageal diseases from DDW 2014.

EOSINOPHILIC ESOPHAGITIS

Patients with eosinophilic esophagitis often require many endoscopies during diagnosis and treatment. A patient undergoing clinical work-up according to consensus guidelines is likely to receive, at the minimum, an esophagogastroduodenoscopy (EGD) at baseline, and another after a trial of proton pump inhibitor (PPI), and a third after starting therapy in order to gauge response.[1] For a patient undergoing dietary elimination therapy with serial food reintroduction, an EGD is typically performed after each food is reintroduced, resulting in an average of nearly five more endoscopies in one recent study.[2] This high number of EGDs results in high costs and increased risk for patients.

Abbreviations: DDW, Digestive Disease Week; EAC, esophageal adenocarcinoma; EGD, esophagogastroduodenoscopy; GERD, gastroesophageal reflux disease; HGD, high grade dysplasia; HRQL, health-related quality of life; LGD, low grade dysplasia; LES, lower esophageal sphincter; POEM, peroral endoscopic myotomy; RFA, radiofrequency ablation; SCC, squamous cell carcinoma; WATS, wide-area tissue sampling.

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At DDW, a group from the Mayo Clinic presented results from a proof-of-concept study using the Cytosponge for minimally invasive evaluation of eosinophilic esophagitis.[3] The Cytosponge is a novel device consisting of a foam sponge compressed into a gelatin capsule, which is attached to a string.[4] Patients swallow the capsule, but the string is kept dangling from the mouth. In the stomach, the capsule dissolves and releases the sponge. The unconstrained sponge is then retrieved by pulling the string, causing the sponge to move retrograde up the esophagus. The sponge collects cells along the entire length of the esophagus as it is pulled through.

Katzka et al. enrolled 20 patients with eosinophilic esophagitis and performed Cytosponge sampling, followed by endoscopy with a routine biopsy protocol to compare the two modalities. Of 16 patients with active eosinophilic esophagitis on the biopsy protocol (>15 eosinophils per high-powered field [eos/hpf]), all had at least 1 eos/hpf on Cytosponge sampling, and 10 had >15 eos/hpf (Fig. 1). Four patients had more eos/hpf on Cytosponge analysis than on biopsy sample analysis, and results from one patient showed eosinophils in the Cytosponge sample but not in the biopsy sample. The r value for the comparison of biopsy and Cytosponge was 0.44, indicating a strong positive correlation. Spongiosis and basal cell hyperplasia were visible on Cytosponge samples. There were no complications with the use of the Cytosponge technique, even though 75% of patients had esophageal strictures. Endoscopists assessed the post-sponge esophagus for abrasion damage, and no significant mucosal abrasions were identified from the Cytosponge. Finally, all patients preferred the Cytosponge method to endoscopy.

This study suggests a promising new technology for evaluating eosinophilic esophagitis, with high patient tolerability and a good preliminary safety profile. Given the high cost of endoscopy, and the frequent endoscopies necessary to diagnose and monitor eosinophilic esophagitis by current guidelines, an inexpensive, less onerous method for monitoring the condition of the esophagus is highly desirable. The eosinophil cell count cutoff for the diagnosis of eosinophilic esophagitis will have to be standardized for Cytosponge sampling, as will the cutoff for successful treatment, but this technique may have a future role in the economical and accurate monitoring of the esophagus for response to treatment of eosinophilic esophagitis.

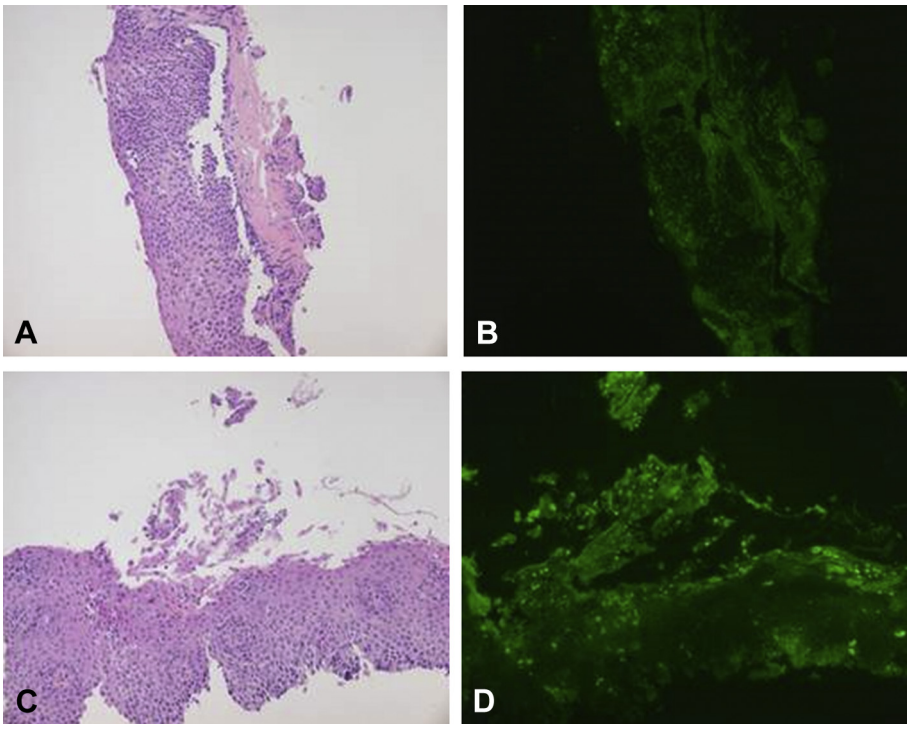

Figure 1. Specimens obtained from Cytosponge sampling from two patients, demonstrating the extensive amount of tissue that can be obtained with this technique. **A, C,** Esophageal tissue samples stained with routine hematoxylin and eosin. **B, D,** Markedly increased immunohistochemical staining for eotaxin-derived neurotoxin for the same specimens. Courtesy of David Katzka.

BARRETT'S ESOPHAGUS

Tissue sampling

Standard biopsy protocols in Barrett's esophagus consist of four-quadrant biopsies at 1–2-cm intervals throughout the length of the Barrett's segment.[5] However, this technique leaves most esophageal tissue unsampled, raising the possibility that dysplastic or cancerous tissue may be missed due to sampling error. The abstract presented by Gross et al. at the Presidential Plenary Session demonstrated the use of wide-area tissue sampling (WATS), a technique that combines brush biopsy with computer-assisted tissue analysis, to evaluate patients with gastroesophageal reflux disease (GERD) and Barrett's esophagus who were receiving care from community gastroenterologists.[6]

A total of 2559 patients underwent WATS followed by traditional forceps biopsy. WATS samples were analyzed using a neural network, which sorted over 100 000 cells from each WATS sample, identifying the 200 most abnormal cells for pathologist review (Fig. 2). Forceps biopsy samples were analyzed using standard histologic techniques. The cohort was predominantly female (60%), with an average age of 55 years and an average Barrett's segment length of <3 cm.

Traditional biopsy identified Barrett's esophagus in 377 patients (15%) and dysplasia in 17 (5% of Barrett's patients). Adjunctive use of WATS sampling identified an additional 258 Barrett's patients, increasing the diagnostic yield to 25%, and found 10 additional cases of dysplasia and 1 cancer. This represents a 68% increase in Barrett's esophagus diagnostic yield and a 65% yield in detection of dysplasia or neoplasia. Whether the sensitivity of forceps biopsy was changed by prior brush biopsy was not evaluated, and it is unclear what gold standard should be used to evaluate sensitivity and specificity of WATS. Notably, these findings are

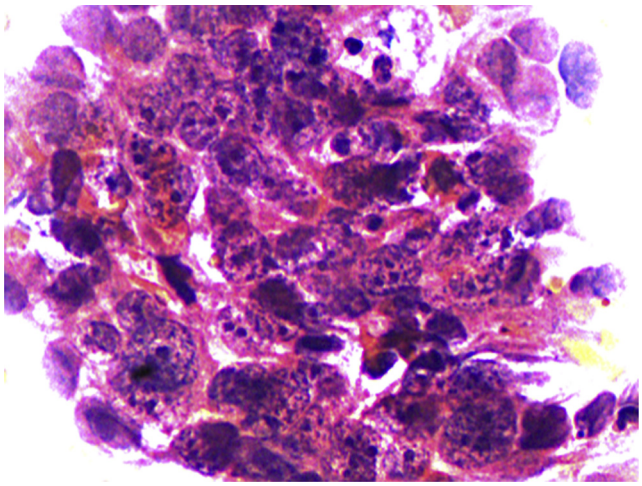

Figure 2. Sample obtained by wide-area tissue sampling demonstrating high grade dysplasia with nuclear hyperchromasia, irregular thick nuclear membranes, increased nuclear to cytoplasmic ratio, overlapping nuclei, and loss of nuclear polarity. Courtesy of Seth Gross.