EDITORIAL

Early steps on the pathway to develop quality metrics that have an impact on postendoscopy upper gastrointestinal cancer rates

More than 7 million EGD procedures are performed annually in the United States, and the uptake of the procedure has rapidly increased over time.[1] EGD remains the gold standard for detection of esophageal and gastric cancer. In a large population-based study among patients with GERD, a normal EGD result was strongly associated with a decrease in total upper GI cancer (UGIC) incidence and mortality for ≤10 years.[2] Conversely and unfortunately, it is increasingly evident that a sizable rate of patients shortly after upper endoscopy can experience postendoscopy UGIC (PEUGIC). A meta-analysis showed a PEUGIC miss rate of 6.4% within 1 year, with no differences between esophageal and gastric cancers.[3] A systematic review showed a 9.4% miss rate of gastric cancer within 3.5 years after a negative EGD result.[4,5] In sum, a prior EGD is strongly associated with decreased incidence of future UGIC; yet, PEUGIC is a major issue.

In the field of screening colonoscopy, quality metrics in terms of lesion detection is relatively mature, with high-quality studies supporting the inverse correlation of adenoma detection rates with interval colorectal cancer.[6] An analysis of interval cancers or even premalignant lesions with endoscopic intraprocedural metrics such as the extent to which the stomach or esophagus is well visualized or sampled is lacking. An interest in defining how upper endoscopy quality metrics could affect cancer prevention outcomes has emerged. This is reflected in recent recommendations for endoscopy units to audit rates of PEUGIC. Specifically, the British Society for Gastroenterology (BSG) recommends monitoring prospective failure to diagnose cancer at endoscopy for ≤3 years after the index EGD.[7]

The American Society for Gastrointestinal Endoscopy has published a recent prolific volume of publications and guidelines on specific clinical indications relevant to the performance of upper endoscopy, including Barrett's esophagus (BE), dyspepsia, and GERD.[8] Yet, an EGD procedure-specific universal guideline in a single document that granularly details and standardizes the intraprocedural approach to upper endoscopy is not currently part of the North American guidelines landscape. Some of the most basic questions in the typical daily practice of upper endoscopy are not clarified. For example, in the common clinical scenario of an erythematous distal part of the stomach in a patient with dyspepsia, if biopsy specimens are to be taken from the stomach, where should they be taken from, and how many? Should they be placed in separate pathology jars? In the absence of such available data and the lack of agreed-upon guidance from guidelines, it is not surprising that there is a wide variation in everyday clinical practice in terms of approach to inspection and also tissue sampling in upper endoscopy.

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In this issue of *Gastrointestinal Endoscopy*, Yang et al[9] report a single-center study that evaluates the impact of endoscopist education on upper endoscopy practice compliance with European Society for Gastrointestinal Endoscopy and BSG guidelines.[7,10] The authors also assessed the association between adherence to endoscopy guidelines and the detection of clinically significant premalignant pathologic changes, including BE, gastric intestinal metaplasia (GIM), and presence of *Helicobacter pylori*. They hypothesized that an educational intervention for the 28 included endoscopists, consisting of a 1-hour presentation on guideline-recommended performance measures, would have an impact not only on compliance with guideline process metrics such as photodocumentation but also on endoscopic detection of premalignant pathologic conditions.

The key findings of their intervention on endoscopist practice were (1) an increase in the use of standardized terminology as recommended in endoscopy reports, (2) an increase in inspection time during endoscopy, (3) an increase in the number of photos of anatomic landmarks taken, and (4) an increase in the detection of *H pylori* through biopsy.

The authors found a notable increase in the detection of *H pylori* from 5.5% to 9.8% after intervention in the setting

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of increased intraprocedural tissue sampling. This is in line with a previous study demonstrating that focused biopsies of mucosal abnormalities as well as nonspecific biopsies of the antrum (greater and lesser curvatures), incisura angularis, and corpus (greater and lesser curvatures) for a total of 5 biopsies was associated with a high probability of accurately diagnosing *H pylori* infection.[11] Conversely, Yang et al[9] showed that despite a significant increase in the use of the Seattle biopsy protocol and the Management of Precancerous Conditions of the Stomach biopsy protocol, the detection rates of BE, GIM, and esophageal and gastric malignancy did not increase significantly.

The study does have limitations. There may have been a selection bias between the historical preintervention and the postintervention groups. There was no control arm, which limits the conclusions of defining specifically how the intervention affected changes in management versus practice patterns over time. The incentives for the endoscopists, if any, to comply with guideline practices were not defined. The study was underpowered to meaningfully address how biopsy protocols could affect the diagnostic yield of cancer detection and was also somewhat underpowered for the detection of precancerous conditions, including intestinal metaplasia.

Yang et al[9] show that a concise educational intervention on the importance of quality metrics for upper endoscopy does increase sampling and photographic documentation rate among endoscopists in alignment with BSG guidelines. The authors should be commended not only for addressing how a defined guideline-based approach affects endoscopic practice patterns but also, importantly, for investigating how that might affect the diagnostic yield of premalignant lesions. In the study by Yang et al,[9] even after the educational intervention, only 3% of all EGDs performed had completed photo documentation of all 10 anatomic locations. This low uptake suggests that endoscopists likely thought that stringent monitoring of all visualized landmarks is of limited value and that this type of detailed process metric may meet some resistance in acceptance. The authors suggest that a minimum inspection time of 7 minutes may be a feasible quality indicator in EGD, inasmuch as it was associated with increased detection rates of BE and a trend in the detection of GIM. A time threshold requirement for EGD seems reasonable, but the actual recommendation of a defined time amount is not known. Clearly, a lengthy EGD could still miss lesions in certain areas, and this could be a role for artificial intelligence to document that the key locations were visualized. The study by Yang et al[9] cannot reliably determine to what extent longer studies really drove the improved detection of pathologic conditions. When BE is detected, this leads to increased procedure time attributable to tissue sampling.[9]

Clearly, further work is needed in defining adequate mucosal visualization at EGD and monitoring that it is achieved so as to inform best practices. Currently, we do not have granular defined intraprocedural metrics that correlate with high detection of precancerous lesions and lead to improved outcomes to inform intraprocedural quality metrics. An important future high-yield step would be to track whether the intensity of endoscopic surveillance in terms of gastric biopsy approaches correlates with the detection of GIM and interval gastric cancers. If PEUGIC rates could be critically assessed on the basis of index procedural metrics, including EGD time allocations, visualization of mucosa at EGD, and the intensity and defined approaches to endoscopic tissue sampling, we could then use these data on drivers of interval cancers to truly seek to enforce important and meaningful metrics that could, we hope, limit PEUGIC. The prevalence of GIM in patients undergoing upper endoscopy for any indication is estimated to be 5%, and rates of progression from GIM to gastric cancer are estimated to be relatively low: 1.1%, and 1.6% at 5 and 10 years, respectively. Thus, studies tracking post endoscopy cancers will need to be quite large in scale to define associated risk factors.[12] Health system outcomes of PEUGIC should be an area of further study and ongoing monitoring. Defining how management protocols of intraprocedural tissue sampling and detection patterns affect PEUGIC rates will require ambitious, well-designed multicenter large-scale studies with discrete and enforced specific approaches to sampling and detection to define optimal practices to optimize the role of EGD in cancer prevention.

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Abbreviations: BE, Barrett's esophagus; BSG, British Society for Gastroenterology; GIM, gastric intestinal metaplasia; PEUGIC, postendoscopy upper GI cancer; UGIC, upper GI cancer.

REFERENCES

1. Peery AF, Dellon ES, Lund J, et al. Burden of gastrointestinal disease in the United States: 2012 update. Gastroenterology 2012;143:1179-87.e3.
2. Holmberg D, Santoni G, von Euler-Chelpin MC, et al. Incidence and mortality in upper gastrointestinal cancer after negative endoscopy for gastroesophageal reflux disease. Gastroenterology 2022;162:431-8.

3. Menon S, Trudgill N. How commonly is upper gastrointestinal cancer missed at endoscopy? A meta-analysis. Endosc Int Open 2014;2:E46-50.
4. Pimenta-Melo AR, Monteiro-Soares M, Libânio D, et al. Missing rate for gastric cancer during upper gastrointestinal endoscopy: a systematic review and meta-analysis. Eur J Gastroenterol Hepatol 2016;28:1041-9.
5. Alexandre L, Tsilegeridis-Legeris T, Lam S. Clinical and endoscopic characteristics associated with post-endoscopy upper gastrointestinal cancers: a systematic review and meta-analysis. Gastroenterology 2022;162:1123-35.
6. Corley DA, Jensen CD, Marks AR, et al. Adenoma detection rate and risk of colorectal cancer and death. N Engl J Med 2014;370:1298-306.
7. Beg S, Ragunath K, Wyman A, et al. Quality standards in upper gastrointestinal endoscopy: a position statement of the British Society of Gastroenterology (BSG) and Association of Upper Gastrointestinal Surgeons of Great Britain and Ireland (AUGIS). Gut 2017;66:1886-99.
8. ASGE. ASGE Guidelines: Upper GI. Available at: https://www.asge.org/home/resources/key-resources/guidelines#upper-gi. Accessed May 5, 2022.
9. Yang LS, Thompson AJ, Taylor ACF, et al. Quality upper GI endoscopy: a prospective cohort study on impact of endoscopist education. Gastrointest Endosc 2022;96:467-75.e1.
10. Bisschops R, Areia M, Coron E, et al. Performance measures for upper gastrointestinal endoscopy: a European Society of Gastrointestinal Endoscopy quality improvement initiative. Endoscopy 2016;48:43-64.
11. de Vries AC, Kuipers EJ. Epidemiology of premalignant gastric lesions: implications for the development of screening and surveillance strategies. Helicobacter 2007;12(suppl 2):22-31.
12. Gupta S, Li D, El Serag HB, et al. AGA clinical practice guidelines on management of gastric intestinal metaplasia. Gastroenterology 2020;158:693-702.