

Routine esophagogastroduodenoscopy before upper endoscopic ultrasound for non-luminal indications: clinical value and findings from a large single-center experience

Reshad Salam^a, Zachary Bassler^a, Yash Hegde^b, Ola Altahan^c, Spencer Kitchen^d, Serge Sorser^e, Douglas G. Adler^f

Henry Ford Providence Hospital, Southfield, Michigan; University of Wisconsin-Madison, Wisconsin; Henry Ford Hospital, Detroit, Michigan; Corewell Health William Beaumont University Hospital, Royal Oak, Michigan; Porter Adventist Hospital, Denver, CO; Peak Gastroenterology Associates, Colorado Springs, USA

Abstract

Background Most echoendoscopes are oblique viewing instruments, potentially limiting their value in mucosal evaluation during upper endoscopic ultrasound (EUS) examinations. This raises at least the potential for missed mucosal lesions. While esophagogastroduodenoscopy (EGD) prior to EUS may mitigate this, performing EGD adds both cost and time to upper EUS. This study evaluated the utility of routine EGD before EUS in asymptomatic patients.

Methods We performed a retrospective, single-center, cohort study including 626 patients undergoing EUS for pancreaticobiliary/mediastinal indications over a 5-year period (2017-2022). Exclusion criteria included luminal symptoms or prior upper gastrointestinal surgery. Clinically significant EGD findings and their impact on management were analyzed.

Results Among 568 patients who underwent EGD before EUS, 16.8% (n=95) had clinically significant lesions, including reflux esophagitis (32.7%), Barrett's esophagus (12.7%) and gastritis (17.3%). Additionally, 16.6% (n=94) exhibited findings affecting the feasibility of EUS (e.g., strictures, large hiatal hernias). Management changes occurred in 54.3% of cases, primarily biopsies (54.3%) and medication initiation (36.6%). Only 4.6% had a prior EGD within 6 months of their EUS.

Conclusions Routine EGD before EUS can detect clinically significant mucosal lesions in asymptomatic patients, as well as anatomical factors influencing EUS performance. These findings support considering the incorporation of routine EGD into pre-EUS evaluations to optimize diagnostic accuracy and patient management.

Keywords Esophagogastroduodenoscopy, endoscopic ultrasound, upper gastrointestinal tract, diagnostic accuracy, luminal lesions

Ann Gastroenterol 2025; 38 (6): 720-724

Conflict of Interest: None

Correspondence to: Douglas G. Adler MD, Center for Advanced Therapeutic Endoscopy, Porter Adventist Hospital, Denver, CO, USA, e-mail: dougraham2001@gmail.com

Received 4 March 2025; accepted 30 September 2025; published online 15 October 2025

DOI: <https://doi.org/10.20524/aog.2025.1015>

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms

Introduction

Endoscopic ultrasound (EUS) has evolved over the past decades, transitioning from a purely diagnostic tool to a set of interventional procedures on intestinal and extraintestinal organs. In the United States alone, more than 500,000 EUS procedures are conducted annually, highlighting the critical role of EUS in the medical landscape [1].

Despite its widespread use, EUS procedures are limited by the oblique field of view of echoendoscopes, which can restrict complete luminal visualization, potentially missing significant lesions [2,3]. To mitigate this limitation,

esophagogastroduodenoscopy (EGD) is sometimes performed before EUS, providing a comprehensive visual assessment of the upper gastrointestinal tract and improving evaluations in gastrointestinal diagnostics [4-6]. However, there is no consensus on the need for, or the value of, routine performance of EGD before EUS, largely because of the variability in practices across institutions and the lack of prospective data supporting this approach [2,7]. This study aimed to address this gap, by evaluating the proportion of clinically meaningful lesions detected when EGD is routinely performed before EUS. This study hypothesized that performing EGD prior to EUS would significantly increase the detection of clinically relevant lesions that would otherwise go undetected with EUS alone, thereby potentially altering patient management and improving diagnostic accuracy.

Patients and methods

This retrospective cohort study was conducted at a secondary care center to assess the utility of performing EGD prior to EUS for non-luminal indications. Patients were eligible for the study if they were at least 18 years old, had no history of dysphagia or other upper gastrointestinal symptoms, and were undergoing EUS for pancreaticobiliary or mediastinal evaluation. Patients were excluded if they were younger than 18 years, required EUS for luminal indications, had a history of dysphagia or upper gastrointestinal symptoms, or had known anatomical alterations of the upper gastrointestinal tract or pancreaticobiliary system. Collected data included demographics (age, sex, ethnicity), clinical indications for EUS, EGD findings, and outcome measures, such as management changes and histopathology results. In all cases, the EGD and EUS were performed sequentially during the same session. Endoscopic findings relevant to EUS, including strictures, stenosis, large hiatal hernias, altered anatomy and unexpected masses, were recorded. Prior EGD within 6 months (at our institution) was noted. Clinically significant lesions were those influencing treatment, requiring additional surveillance, intervention or further imaging.

Clinically significant lesions included gastric or duodenal ulcers, various forms of esophagitis (erosive, ulcerative or infectious), *Helicobacter pylori*-positive gastritis, Barrett's esophagus with endoscopic and histological confirmation, malignancies and neoplastic polyps/lesions (e.g., adenomas).

^aDepartment of Internal Medicine, Henry Ford Providence Hospital, Southfield, Michigan, USA (Reshad Salam, Zachary Bassler);

^bDepartment of Medicine, School of Medicine & Public Health, University of Wisconsin-Madison, Madison, Wisconsin, USA (Yash Hegde); ^cDepartment of Internal Medicine, Henry Ford Hospital, Detroit, Michigan, USA (Ola Altahan); ^dDepartment of Anesthesiology, Corewell Health William Beaumont University Hospital, Royal Oak, Michigan, USA (Spencer Kitchen); ^eDepartment of Gastroenterology, Peak Gastroenterology Associates, Colorado Springs, Colorado, USA (Serge Sorser); ^fCenter for Advanced Therapeutic Endoscopy, Porter Adventist Hospital, Denver, CO, USA (Douglas G. Adler)

Statistical analysis

Descriptive statistics were calculated for all variables, including means, frequencies and percentages to summarize the data. A 1-way chi-squared test was performed to assess the statistical significance of differences in clinical outcomes between patients who underwent EGD prior to EUS and those who did not. Statistical significance was set at a P-value of less than 0.05. All analyses were conducted using SPSS software (IBM Corp., Armonk, NY, USA).

Results

Data were collected from the medical records of 2 endoscopists who conducted EUS procedures between January 2017 and December 2022. Initially, 863 patients were identified; however, after the exclusion criteria had been applied and those with missing data excluded, the final analysis included 626 patients who underwent EUS for non-luminal indications. Among those excluded were 10 patients who had EUS for evaluation of submucosal lesions. Additionally, of these 626 patients, a total of 568 had an EGD performed immediately prior to EUS.

The primary indications for EUS included pancreatic cysts (31.2%, n=177), pancreatic neoplasms (23.5%, n=133) and common bile duct dilation (17.7%, n=100). Acute pancreatitis accounted for 7.6% (n=43) of cases, while chronic pancreatitis and elevated liver enzymes were less frequent, representing 4.0% (n=23) and 5.1% (n=29), respectively. Mediastinal lesions and liver masses were the least common indications, each found in less than 1% of the patients (Table 1).

The most prevalent EGD findings were reflux esophagitis (32.7%, n=36), gastritis (17.3%, n=19), and Barrett's esophagus (12.7%, n=14). Notably, duodenal ulcers and gastric ulcers were also detected, albeit less frequently (7.3% and 2.7%, respectively). On histopathological evaluation, benign squamous mucosa with reflux changes (24.7%, n=22) and intestinal metaplasia of the granular type (19.1%, n=17) were the most common findings. Changes in management or additional diagnostics were frequently necessitated by these findings, with tissue biopsy (54.3%, n=70) and medication initiation (36.6%, n=47) being the most common interventions (Table 2).

Among the 568 patients who underwent preliminary EGD, 95 (16.8%) had clinically significant findings. In addition, 94 patients (16.6%) had findings on EGD that could potentially influence the subsequent EUS examination. Only a small fraction of the patients (4.6%, n=26) had undergone an EGD within the last 6 months prior to the current examination. Of these, 6 patients were found to have clinically significant findings, including erosive esophagitis, Barrett's esophagus, duodenal stenosis, large hiatal hernia >5 cm and esophageal candidiasis.

Discussion

Our study found that 16.5% of patients undergoing EGD prior to EUS had clinically significant findings, demonstrating

Table 1 Patient demographics and procedure indications

Category	N=568
Age (years)	
Minimum	18
Maximum	95
Mean	67.21
Sex (n)	
Male	230
Female	338
Race (n)	
Caucasian	380
African American	128
Unknown	53
Asian	7
Prior EGD [n, (%)]	
Yes	26 (4.6%)
No	542 (95.4%)
Procedure Indications (n)	
CBD dilation	119
Acute pancreatitis	51
Pancreatic neoplasm	158
Pancreatic cyst	210
Pancreatic duct dilation	40
Chronic pancreatitis	27
Elevated liver enzymes	34
Abdominal/mediastinal lymph node enlargement	10
Mediastinal lesion	6
Liver mass	6
Other	12

CBD, common bile duct

that luminal examination should be considered for upper EUS exams in otherwise asymptomatic individuals. This rate is lower than the 29.7% and 22.1% reported by Kim *et al* and Sahakian *et al*, respectively, probably because of differences in patient populations, study designs and definitions of clinically significant findings [2,7]. For instance, our study excluded patients with dysphagia or upper gastrointestinal symptoms, while Kim *et al* excluded pregnant patients and those with significant comorbidities [7]. Additionally, our study included a broader range of findings, such as strictures and large hiatal hernias, which could impact the safety and feasibility of subsequent EUS procedures.

The most common EGD findings in our study were reflux esophagitis (32.7%), gastritis (17.3%) and Barrett's esophagus (12.7%), consistent with prior studies. Baltz *et al* reported that 62% of patients had luminal abnormalities, with 9% having significant pathologies affecting management, including erosive esophagitis and Barrett's esophagus [8]. Similarly, Kim *et al* found erosive esophagitis and Barrett's esophagus in 10.9% and 6.3% of patients, respectively [7]. A recent study by Alkurdi *et al* demonstrated that routine EGD prior to EUS detects clinically significant luminal lesions in up to 38.78% of asymptomatic patients: the authors identified actionable pathologies (e.g., Barrett's esophagus, peptic ulcers, stenosis) in a substantial proportion of patients, which might have remained undetected by oblique-viewing EUS alone [9]. These findings highlight the importance of

thorough luminal evaluation, particularly in the esophagus and stomach, where lesions can be missed by non-forward-viewing endoscopes unless dedicated efforts to visualize the mucosa are undertaken [1,3].

Importantly, 16.6% of patients had EGD findings that could influence subsequent EUS procedures, such as strictures, large hiatal hernias or surgically altered anatomy. Sahakian *et al* reported similar findings, with 9.8% of patients having lesions impacting EUS [2]. A study by El-Dika *et al* demonstrated that upper endoscopy found luminal abnormalities (such as stenosis or diverticula) in 12% of patients referred for EUS examination of the pancreas [5]. Alkurdi *et al* reported that 6.93% of patients had findings detected by EGD (e.g., stenosis, upside-down stomach) that directly impacted the feasibility of endoscopic retrograde cholangiopancreatography or EUS and necessitated preprocedural dilatation in 2.4% of cases [9]. This underscores the clinical significance of these findings and the need to consider comprehensive luminal evaluation to ensure safe and effective EUS procedures. Sahakian *et al* also emphasized the importance of thorough diagnostic evaluations prior to complex procedures, noting that such evaluations can enhance patient safety by identifying conditions that might otherwise complicate subsequent interventions [2].

Management changes, such as medication initiation (36.6%), were common in our study, often prompted by diagnostic steps, such as tissue biopsy (54.3%), to further evaluate findings detected during EGD. These changes reflect the impact of early lesion detection on patient outcomes. Abu Ghanimeh *et al* reported management changes in 67% of asymptomatic patients undergoing EGD prior to EUS, while Sahakian *et al* noted changes in 15.7% of cases [2,10]. These findings suggest that EGD can influence clinical decisions, particularly in asymptomatic patients.

The statistical significance of our findings ($P < 0.005$) supports the diagnostic utility of EGD in identifying conditions that may be missed by EUS alone. Ashby *et al* also found that performing forward-viewing endoscopy during EUS detected additional lesions in 20.5% of cases ($P = 0.00025$) [1]. In contrast, Kim *et al* found no significant difference in miss rates between EGD and linear-array EUS for clinically meaningful lesions ($P = 0.39$), suggesting that both modalities are equally effective [7].

Differences in detection rates across studies may stem from variations in patient demographics, endoscopic techniques, and operator expertise. For example, the higher rate of clinically significant findings in the study by Kim *et al* could be attributed to its multicenter design, which included a broader patient population [7]. Additionally, the prevalence of underlying risk factors for gastrointestinal conditions, such as alcohol or tobacco use, may influence detection rates, as suggested by Abu Ghanimeh *et al* [10].

Early detection of lesions, such as gastric ulcers or Barrett's esophagus, can prevent complications like bleeding or cancer progression. Moreover, the low percentage of patients who had undergone EGD in the 6 months prior to our study suggests that many patients may go for extended periods without thorough luminal examination, increasing the risk of missed diagnoses. Consideration of routine EGD could enhance patient safety

Table 2 Clinically significant findings and management

Findings	Number	Percent (%)
Clinically significant by type		
Reflux esophagitis	36	32.7%
Gastritis	19	17.3%
Barrett's esophagitis	14	12.7%
Neoplastic polyp/lesion	12	10.9%
Duodenal ulcer	7	6.4%
Duodenal mucosal changes	8	7.3%
Esophageal candidiasis	6	5.5%
Large hiatal hernia (> 5 cm)	3	2.7%
Gastric ulcer	3	2.7%
Duodenal mass	1	0.9%
Gastric varices	1	0.9%
Esophageal varices	1	0.9%
Eosinophilic esophagitis	1	0.9%
Site of clinically significant findings		
Distal esophagus	49	34.8%
Gastric antrum	17	12.1%
Gastric body	14	9.9%
1 st portion of duodenum	14	9.9%
Gastroesophageal junction	13	9.2%
2 nd portion of duodenum	8	5.7%
Middle esophagus	5	3.6%
Ampulla	5	3.6%
Gastric fundus	1	0.7%
Duodenojejunal anastomosis site	1	0.7%
Histopathology findings		
Benign squamous mucosa with reflux changes	22	24.7%
Intestinal metaplasia of glandular mucosa	17	19.1%
<i>Helicobacter pylori</i> gastritis	16	18%
Duodenitis with reactive changes	10	11.2%
Mild chronic gastritis	8	9%
Focal acute esophagitis with candida species	4	4.5%
Adenoma	5	5.6%
Ulceration	3	3.4%
Patchy gastric surface cell metaplasia	2	2.25%
Neuroendocrine carcinoma	1	1.1%
Increased intraepithelial eosinophils	1	1.1%
Type of management change		
Tissue biopsy	70	54.3%
Medication initiation	47	36.4%
Repeat upper endoscopy	15	11.6%
Lifestyle change	7	5.4%
Polyp resection	4	3.1%

by identifying lesions that might otherwise complicate EUS procedures. Notably, our study demonstrated an additional diagnostic yield even among patients who had undergone an EGD within the prior 6 months. This suggests that repeating EGD at the time of EUS may still uncover clinically significant findings. However, future studies should evaluate whether a defined timeframe (e.g., 6-12 months) after a prior negative EGD might be sufficient to obviate the need for repeat examination.

Our study had some limitations. High-quality esophageal/gastric/duodenal evaluation can be performed with echoendoscopes, and it is unknown how this compares to

dedicated EGD. The study's retrospective, single-center design may have introduced selection bias, limiting its generalizability. Additionally, the reliance on inpatient records may have underestimated the full impact of EGD findings, as outpatient follow-up data, including biopsy results and subsequent interventions, were not captured. Future prospective, multicenter studies are needed to validate our findings and explore the clinical benefits of routine EGD before EUS.

In conclusion, our study supports the value of a routine EGD before EUS in detecting clinically significant luminal lesions and influencing patient management. While EGD is not mandatory prior to EUS, it should be considered, as it can uncover relevant findings that may alter clinical decisions. Further research is needed to standardize practices and improve diagnostic accuracy in gastroenterology.

Summary Box

What is already known:

- Previous studies have demonstrated that routine esophagogastroduodenoscopy (EGD) before endoscopic ultrasound (EUS) detects clinically meaningful luminal lesions in a significant proportion of patients (20-30%)
- Such lesions may include erosive esophagitis, Barrett's esophagus, peptic ulcers, strictures, and large hiatal hernias, many of which could be missed with oblique-viewing echoendoscopes
- Findings on EGD can influence the subsequent performance of EUS, with up to 9.8-12% of patients having abnormalities impacting scope passage or requiring interventions
- Despite these observations, clinical practice remains variable and there is no consensus guideline recommending routine EGD before EUS

What the new findings are:

- In our large single-center cohort of 568 patients undergoing EUS for non-luminal indications, 16.8% had clinically significant findings on routine EGD, including reflux esophagitis, Barrett's esophagus and gastritis
- Importantly, 16.6% of patients had findings that directly impacted the feasibility of EUS (e.g., strictures, surgically altered anatomy or large hiatal hernias)
- Our data highlight that, even in asymptomatic patients, a meaningful proportion harbor actionable lesions that would otherwise remain undetected and potentially complicate EUS
- Compared with prior reports, our findings reinforce the diagnostic and procedural utility of EGD, while also demonstrating real-world management implications, such as biopsy (54.3%) and medication initiation (36.6%)

References

1. Thomas A, Vamadevan AS, Slattery E, Sejpal DV, Trindade AJ. Performing forward-viewing endoscopy at time of pancreaticobiliary EUS and ERCP may detect additional upper gastrointestinal lesions. *Endosc Int Open* 2016;**4**: E193-E197.
2. Sahakian AB, Aslanian HR, Mehra M, et al. The utility of esophagogastroduodenoscopy before endoscopic ultrasonography in patients undergoing endoscopic ultrasonography for pancreatico-biliary and mediastinal indications. *J Clin Gastroenterol* 2013;**47**:857-860.
3. Jung A, Schlag C, Becker V, et al. Endosonography for right-sided and acute upper intestinal misery: the EFRAIM study: a prospective, randomized, controlled, blinded study. *United European Gastroenterol J* 2013;**1**:329-334.
4. Chang KJ, Erickson RA, Chak A, et al. EUS compared with endoscopy plus transabdominal US in the initial diagnostic evaluation of patients with upper abdominal pain. *Gastrointest Endosc* 2010;**72**:967-974.
5. El-Dika S, Baltz J, White GE, Kahaleh M, Shami VM. Leading the blind: standard upper endoscopy provides an important road map prior to endoscopic ultrasound in patients without known luminal pathology. *Gastrointest Endosc* 2009;**69**: AB336.
6. Dietrich CF, Arcidiacono PG, Braden B, et al. What should be known prior to performing EUS? *Endosc Ultrasound* 2019;**8**:3-16.
7. Kim S, Hamerski C, Ghassemi K, et al. The clinical utility of evaluating the luminal upper gastrointestinal tract during linear endoscopic ultrasonography. *J Clin Gastroenterol* 2016;**50**: 538-544.
8. Baltz J, Shami VM, White GE, Kahaleh M, El-Dika S. Standard upper endoscopy prior to endoscopic ultrasound evaluation finds significant luminal pathology. *Gastrointest Endosc* 2009;**69**:PAB336.
9. Alkurdi A. Retrospective dual-center study of the benefit of diagnostic gastroscopy with forward-optic before endoscopy with side-viewing optic [dissertation]. Charité – Universitätsmedizin Berlin; 2024. Available from: <https://refubium.fu-berlin.de/bitstream/handle/fub188/41303/diss-a.alkurdi.pdf> [Accessed 2 October 2025].
10. Abu Ghanimeh MK, Abdulhamid A, Stanley S, et al. Esophagogastroduodenoscopy with every endoscopic ultrasound study – is it necessary? A single center experience. *Am J Gastroenterol* 2018;**113**:S276-S277.