

## Practice Patterns and Outcomes in Patients with Esophagitis

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### Abstract

**Background:** Gastroesophageal reflux disease (GERD) is a chronic condition in which acid from the stomach damages the native esophageal mucosa and commonly causes symptoms of heartburn, regurgitation, and dysphagia. Complications of GERD include erosive esophagitis, Barrett's esophagus (BE), and esophageal cancer. Our objectives were to understand the practice patterns in the management of patients with esophagitis, characterize patients with esophagitis who presented to Saint Louis University Hospital (SLUH) for endoscopy, and to evaluate short-term outcomes in these patients.

**Methods:** We identified patients with an endoscopic diagnosis of esophagitis, who presented to SLUH for upper endoscopy for any indication between January 1st and December 31st 2009. After exclusion criteria were considered, a total of 96 patients were identified for the study. Laboratory and pathology data were reviewed for initial and follow up endoscopy. Demographics, severity of esophagitis, length of BE, follow-up recommendations, and outcomes were recorded.

**Results:** Of the 96 patients involved in the study, 7 had suspected BE on EGD. Among those patients with suspected BE, 4 had a follow up EGD, none of which showed severe esophagitis. Although 23 of the 96 patients (23%) had esophageal biopsies, only 2 had tissue pathology confirming Barrett's esophagus. Further findings are presented in this paper.

**Conclusion:** Our data demonstrates, among other findings, that we are not optimizing acid suppression use in disease processes that are acid mediated. More research and development of standardized protocols to guide care for patients with esophagitis and help decrease endoscopy costs are warranted.

**Keywords:** Esophagus; Barrett's esophagus; Esophagitis; GERD

### Introduction

Gastroesophageal reflux disease (GERD) is a chronic condition in which acid from the stomach damages the native esophageal mucosa and commonly causes symptoms of heartburn, regurgitation, and dysphagia. It is one of the most prevalent diseases in the United States, with up to 20% of the adult population affected by daily symptoms [1-5]. Complications of GERD include erosive esophagitis, Barrett's esophagus (BE), and esophageal cancer [1,6].

Both human and animal studies have suggested that severe esophageal injury from GERD results in increased risk of BE [1,6-8]. BE results from the metaplastic alteration of the distal squamous esophageal epithelium into specialized columnar epithelium as a response to this injury [1,9-11]. Previous data suggests that erosive esophagitis may be a precursor step of metaplasia [8]. Although there is data that prolonged duration and more severe erosive esophagitis may result in metaplastic healing and increased risk of BE and adenocarcinoma, the data is not clear. Several studies have not shown a significant correlation between grades of esophagitis and the development of BE [1].

However, expert opinion suggests patients with severe esophagitis undergo repeat endoscopy for detection of BE because severe inflammation may mask the presence of intestinal metaplasia and dysplasia. A recent prospective study revealed 12% of patients with erosive esophagitis had BE on subsequent 10 week endoscopy [1]. This study included patients with more severe esophagitis and it is unclear how best to manage patients with less severe esophagitis. Also, optimal timing of repeat endoscopy is uncertain as there appears to be significant variation in the management of these patients and there is currently little data on how best to manage patients with esophagitis in terms of BE surveillance. Our objectives were to understand the practice patterns in the management of patients with esophagitis, characterize patients with esophagitis who presented to Saint Louis University Hospital (SLUH) for endoscopy, and to evaluate short-term outcomes in these patients.

### Methods

#### Patient selection and data collection

We identified patients with an endoscopic diagnosis of esophagitis, who presented to SLUH for upper endoscopy for any indication between January 1st and December 31st 2009. As stated, one of the main objectives of our study was to evaluate short-term outcomes in

our patients. Current ACG guidelines suggest performing a repeat endoscopy in 8-12 weeks if there is evidence of Grade B, C, or D esophagitis to assess healing and exclude the presence of BE. Given these guidelines, we chose to evaluate short-term outcomes by reviewing a 1 year period during which time most patients should have returned for repeat endoscopy.

Institutional review board approval was obtained. Patients were excluded if they had incomplete medical records. All endoscopic examinations were performed either by an experienced attending physician or by a gastroenterology fellow under the direct supervision of an attending physician. Endoscopy and pathology reports were carefully reviewed to determine eligibility for the study. The presence of esophagitis was graded using the LA classification system [12].

If grade was not assigned at the time of EGD, a grade was assigned based on the presence of erosions described. Mild esophagitis was defined as LA class A or B. Severe esophagitis was defined as LA class C or D. Data was pulled from endoscopic reports regarding the relationship between the squamocolumnar junction (SCJ), gastroesophageal junction (GEJ), and length of BE. BE was defined as the presence of columnar mucosa in the distal esophagus and histologic evidence of intestinal metaplasia.

The length of BE was measured from the proximally displaced SCJ to the GEJ. Experienced gastrointestinal pathologists assessed the biopsy specimens. Laboratory and pathology data were reviewed for initial endoscopy (EGD1) and follow up endoscopy (EGD2). The following data were recorded: demographics, severity of esophagitis, follow-up recommendations, and outcomes. Data was analyzed using SPSS® (19). Categorical variables were expressed as percentages and analyzed through chi square and Fisher's exact tests and continuous variables were analyzed using Student's t test.

## Results

### Patient selection

A total of 104 patients were initially identified for the study based on inclusion dates. 8 of these patients were excluded based on previously described exclusion criteria (patients with incomplete medical records, a previous diagnosis of BE or esophageal cancer) (Figure 1).

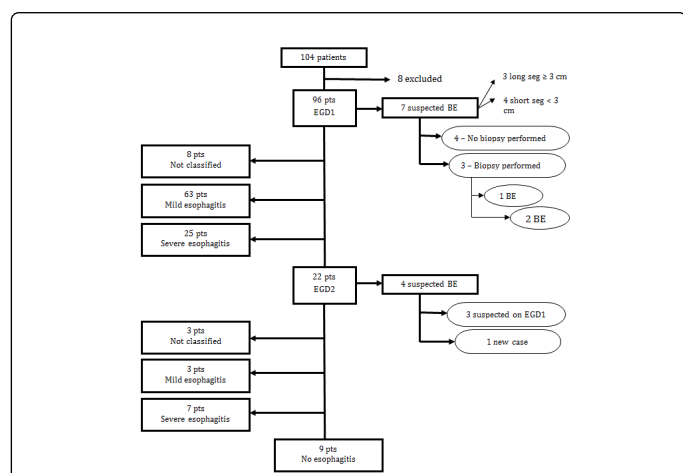


Figure 1: Algorithm for all selected patients.

### Initial Endoscopy (EGD1)

96 patients were diagnosed with esophagitis on initial endoscopy (EGD1) during CY 2009. The demographic data of these patients are shown in Table 1. The mean age was 54 (18-89) and the mean BMI was 29.58 (13-64). The most common indication for initial endoscopy was abdominal pain. Other indications are shown below in Table 2.

Number of patients (%)	
<b>Sex</b>	
Male	56 (58%)
Female	40 (42%)
<b>Ethnicity</b>	
Caucasian	71 (74%)
Blacks	20 (21%)
Asian	1 (1%)
Others	4 (4%)
<b>Smoking</b>	
Current smoker	36 (38%)
Current nonsmoker	41 (43%)
Unknown	19 (19%)
<b>Admission status</b>	
Inpatient	38 (40%)
Outpatient	58 (60%)

Table 1: Demographics of patients diagnosed with esophagitis on initial endoscopy (EGD1).

	Frequency	Percentage
Abdominal pain	18	18.8
GERD	15	15.6
GI bleeding	13	13.6
Nausea and Vomiting	12	12.5
Variceal surveillance	12	12.5
PEG	6	6.3
Abnormal imaging	5	5.2
Dysphagia	4	4.2
Diarrhea	3	3.1
Anemia	2	2.1
Odynophagia	2	2.1
Other	4	4

Table 2: Indications for initial endoscopy

Prior to EGD1, 45 patients (47%) were taking a PPI. On initial endoscopy, 63 (66%) had mild esophagitis and 25 (26%) had severe esophagitis. There were 8 patients whose grade of esophagitis was not classified (Table 3).

Caffeine consumption (p=0.008) and inpatient status (p=0.000) were found to be risk factors for severe esophagitis in univariate analysis.

However, multivariate analysis confirmed only inpatient status as a significant risk factor for severity of esophagitis.

### Follow up Endoscopy (EGD2)

Follow up EGD (EGD2) was performed in 22 patients (23%). The most common indications for EGD2 were nausea/vomiting, follow up of varices, and esophagitis (5.2%). Of the 22 patients who had a follow up EGD, 7 (32%) had severe esophagitis.

The mean time interval between EGD1 and EGD2 was 30.73 weeks. The endoscopic findings are shown in Table 3.

Of the 96 patients involved in the study, 7 had suspected BE on EGD1. Three of these patients appeared to have long segment BE (≥3 cm). Among those patients with suspected BE, 4 had a follow up EGD, none of which showed severe esophagitis.

Although 23 of the 96 patients (23%) had esophageal biopsies, only 2 had tissue pathology confirming Barrett's esophagus (Table 4).

	EGD1 N= 96 (%)	EGD2 N=22 (%)
<b>Grade of esophagitis</b>		
<b>Mild (A + B)</b>	63 (66)	3 (14)
<b>Severe (C + D)</b>	25 (26)	7 (32)
<b>Not classified</b>	8 (8)	3 (14)
<b>No esophagitis</b>	Not applicable	9 (40)
<b>Taking PPI prior to endoscopy</b>	45 (47)	15 (68)
<b>Suspected Barrett's esophagus</b>	7 (7)	4 (18)
<b>Esophageal biopsy</b>	23 (24)	6 (27)
<b>Evidence of Barrett's esophagus</b>	2/23 (9)	4/6 (67)
<b>Hiatal hernia</b>	33 (34)	10 (45)
<b>Candida esophagitis</b>	8 (8)	1 (4)
<b>Recommended for follow up EGD</b>	22 (23)	6 (27)
<b>Recommended PPI</b>	76 (79)	18 (82)

**Table 3:** Characteristics of initial endoscopy (EGD1) and follow up endoscopy (EGD2)

Initial EGD					Follow up EGD				
	PPI before EGD1	Grade of esophagitis	Length of BE (cm)	Biopsy	PPI before EGD2	Grade of esophagitis	Length of BE (cm)	Biopsy	
1	No	A	1	Not done	-	-	-	-	
2	No	A	1	Not done	-	-	-	-	
3	No	C	10	Not done	Yes	None	7	BE+, low grade dysplasia	
4	Unknown	A	3	Not done	Unknown	-	None	Not done	
5	No	B	2	Negative	Yes	None	2	BE+, without dysplasia	
6	No	D	6	BE+, indefinite for dysplasia	-	-	-	-	
7	Yes	B	2	BE+, without dysplasia	Yes	A	3	BE+, high grade dysplasia	
8*	Yes	A	Not seen	Negative	No	None	1	BE+, low grade dysplasia	

\* New case of suspected Barrett's on EGD2 only

**Table 4:** Clinical and endoscopic data for patients with suspected Barrett's on endoscopy (EGD1 or EGD2)

Among our patients, 10 of the 25 (40%) with severe esophagitis had recommendations for repeat EGD whereas 16 of the 63 (25%) with mild esophagitis had recommendations for repeat EGD. 9 (36%) of the patients with severe esophagitis underwent repeat endoscopy vs. 10 (15.9%) of the patients with mild esophagitis. However among those with severe esophagitis on EGD1, 7 (32%) patients still had severe esophagitis on EGD2.

Those with severe esophagitis were 4 times more likely to have a documented repeat EGD than patients with mild esophagitis (p=0.04). No patient with mild esophagitis on EGD1 had severe esophagitis on EGD2. A recommendation for repeat endoscopy was statistically significant, (likelihood ratio: 7.4, p=0.004), in having a documented follow up EGD.

Following EGD1, all patients with severe esophagitis had recommendations to undergo acid suppression therapy. 57 of the 63

patients (91.2%) with mild esophagitis were recommended to use or continue to use acid suppression treatment, while 7% were not given a recommendation regarding acid suppression therapy.

## Discussion

BE is a known precursor of esophageal adenocarcinoma which has a high mortality and morbidity. Esophagitis is a common finding on endoscopy but its relationship to BE is unclear. Better defining its relationship may help identify patients at high risk for BE and progression. Our objective was to look at whether practice patterns in our institution follow current ACG guidelines regarding esophagitis. Our hope is that our study and other future studies will help to identify discrepancies between current practice patterns and guidelines, and identify the barriers that result in these discrepancies.

7% of our patients with esophagitis were suspected to have Barrett's esophagus, 2 of whom were found to have severe esophagitis on EGD1. Although patients with severe esophagitis were more likely to have recommendations for a follow up EGD than mild esophagitis, less than half had recommendations for a follow up EGD. It is important to note that the recommendations were important in predicting follow up EGD. Among patients with esophagitis who underwent repeat EGD, the majority continued to have esophagitis. Only 2/3 was on acid suppression prior to follow up EGD. These findings suggest that rather than focusing on follow up endoscopy, we should be more focused on compliance with acid suppression which can treat both esophagitis and BE. Many patients still had persistent esophagitis on follow up endoscopy. This may be a reflection of the timing of repeat endoscopy but most had a repeat EGD at least 3 months after initial EGD which should be adequate time to document healing.

Barrett's esophagus could be seen with both mild and severe esophagitis suggesting that all patients with esophagitis may benefit from biopsies for Barrett's esophagus. This also may help capture potential BE as many patients did not have follow up EGD even though BE was suspected. However, the cost effectiveness of performing follow up EGD in those patients with mild esophagitis or severe esophagitis has not been demonstrated.

Limitations of our study include a retrospective study design, small number of patients who developed Barrett's, data from a single tertiary care center with mostly Caucasians, and limited follow up of patients.

Significant research, guidelines and time are spent on endoscopic surveillance recommendations in patients at risk for Barrett's esophagus. In a study done by Inadomi et al. an analytic model was used to determine the cost effectiveness of screening and surveillance of Barrett's. It was found that screening patients with symptoms of GERD once to identify adenocarcinoma associated with Barrett's is likely beneficial, but continued 5-year surveillance for patients with Barrett's without dysplasia was not cost-effective [13]. However, there is no data on cost effectiveness for surveillance EGD for those patients with esophagitis. Our data demonstrate that we are not optimizing acid suppression use in disease processes that are acid mediated. Many

repeat endoscopies are done and often for additional indications other than follow up esophagitis. In fact, perhaps more attention should be directed at medical therapy of these patients rather than continued endoscopic surveillance. Previous studies have suggested the importance of healing esophagitis prior to performing endoscopy.1 our data suggest the majority of patients with esophagitis do not have Barrett's esophagus. Gerson et al. suggest Barrett's esophagus follows severe esophagitis exclusively and repeat endoscopy is not indicated unless severe esophagitis is found.8 However, we note that both mild and severe esophagitis can be precursors for Barrett's esophagus. Perhaps this is an area where biomarkers may be used for risk stratification in patients with Barrett's esophagus. More research and development of standardized protocols to guide care for patients with esophagitis and help decrease costs related to surveillance endoscopy are warranted.

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