Original Article

Endoscopic Surveillance for Gastric Ulcers

Mohammad Esmadi, MD, Dina S. Ahmad, MD, and Hazem T. Hammad, MD

Objective: Gastric ulcers (GUs) can be caused by a malignancy, and endoscopists are challenged with the question of how to rule out underlying malignancy. Although routine endoscopic surveillance is not advised, it is still overused. The purpose of this study was to explore the practice in our tertiary referral center during the last 3 years.

Methods: We retrospectively reviewed all inpatient and outpatient esophagogastroduodenoscopies (EGDs) that were performed between November 2009 and November 2012 for GUs. Patients with GUs who normally would not undergo biopsy, such as patients who present with bleeding or had stigmata of high-risk bleeding, were excluded.

Results: A total of 165 patients were diagnosed between November 2009 and November 2012 as having GUs on EGD. Fifty-two patients were excluded because they presented with bleeding or had GUs that had stigmata of high-risk bleeding. We reviewed the charts of 113 patients and endoscopic surveillance was recommended for 96 (85%). Of those 96 patients, 72 (64%) underwent repeat EGD. In those 72 patients, GU was still present in 9 patients and was completely healed or healing in 63 patients. Only 25 (22%) GUs were biopsied at initial EGD, 23 of which were benign and 2 were adenocarcinomas. No additional malignancy was found on surveillance EGD.

Conclusions: EGD surveillance for GUs is a common practice, although the guidelines discourage such a practice. Our rate of endoscopic surveillance was significantly higher than reported previously (64% vs 25%). In our experience, such a high rate of surveillance did not reveal any additional gastric malignancy. Alternatively, the rate of biopsy of GUs at initial EGD is low (22%), which also reflects endoscopists' preference for endoscopic surveillance.

Key Words: endoscopy, gastric ulcer, stomach neoplasms

Peptic ulcer disease (PUD) is a common problem worldwide. The annual incidence ranges from 0.1% to 0.19% for physician-diagnosed PUD and 0.03% to 0.17% when based on hospitalization data.[1] The prevalence of gastric ulcers (GUs) is 4% and the lifetime incidence is >10% in the general population.[2–4] GUs are frequent findings on esophagogastroduodenoscopy (EGD). Because GUs carry the risk of malignancy, endoscopists are usually challenged with the question of how to rule out malignancy. GUs that appear suspicious for malignancy on EGD, such as an associated mass lesion, elevated irregular ulcer borders, and abnormal adjacent mucosal folds,[5,6] usually cause endoscopists to obtain biopsies. Approximately 90% of GUs appear benign on endoscopy[7,8] and 5% of GUs appearing endoscopically benign are malignant.[9–11] As such, the endosopic appearance may not be adequate to determine which GUs are malignant and warrant biopsy.

Obtaining multiple biopsies of all GUs at the time of the initial EGD is a reasonable approach and has been shown to be highly sensitive for detecting malignancy (up to 98% sensitivity when seven biopsies are obtained from the ulcer margin and base).[11,12] The other commonly practiced approach is to repeat the EGD in 8 to 12 weeks to document healing of the GU. This approach can be questioned because of the controversy surrounding whether follow-up endoscopy actually improves survival.[13,14] In addition, the declining incidence of gastric cancer in the United States and the added cost of repeat endoscopy argue against surveillance.[15] Because of these factors, the American Society for Gastrointestinal Endoscopy (ASGE), the American College of Gastroenterology, and the American Gastroenterological Association do not recommend routine EGD surveillance for patients with GUs.[16,17]

Although guidelines discourage routine EGD surveillance for patients with GUs, it is still a common practice. An analysis of the Clinical Outcomes Research Initiative database found that approximately 25% of outpatients diagnosed between 2001 and 2005 as having GUs underwent repeat endoscopy within 3 months[18]; therefore, we conducted the present study to explore the practice in our institution during the last 3 years.

Key Points

- Our rate of endoscopic surveillance was significantly higher than the national rate (64% vs 25%). Such a high rate of surveillance did not reveal any additional gastric ulcers (GUs), which adds more evidence to the low yield of routine surveillance.
- The rate of GU biopsy at initial EGD is low (22%), which reflects that endoscopists prefer endoscopic surveillance over performing biopsies at initial EGD.
- More awareness is needed to decrease the rate of unnecessary endoscopic surveillance.

From the University of Missouri School of Medicine, Columbia.

Reprint requests to Dr Mohammad Esmadi, One Hospital Dr, DC043.00 Health Sciences Center, Columbia, MO 65212. Email: mohsmadi@hotmail.com

The authors have no financial relationships to disclose and no conflicts of interest to report.

Accepted November 12, 2013.

0038-4348/0–2000/107-289
DOI: 10.1097/SMJ.0000000000000099

Methods

We retrospectively reviewed the EGDs of 165 different patients with GUs at initial EGD between November 2009 and November 2012 at the University of Missouri Hospital. The computer endoscopy software program searched for the terms "gastric," "stomach," and "ulcer(s)" during that period. The search resulted in the identification of 165 cases with one or more gastric ulcers, which included inpatient and outpatient procedures. We excluded 52 patients with GU who normally would not be biopsied because of the concern over bleeding (eg, active bleeding on EGD, visible vessel, adherent clot, or presentation with severe gastrointestinal bleeding), leaving 113 study subjects. We looked at the patients' age, ethnicity, nonsteroidal anti-inflammatory drug (NSAID) intake, *Helicobacter pylori* infection, and endoscopic appearance of the ulcer. The study was approved by the institutional review board at the University of Missouri School of Medicine.

Results

The mean age of the 113 patients was 54.4 ± 15.4 years (standard deviation). Forty-three (38%) were men and 70 (62%) were women. Two patients (1.7%) were from an ethnicity (Asian) at high risk for GU and 111 (98.3%) were from an ethnicity (white or African American) at low risk for GU. Ninety-six (85%) were outpatients and 17 (15%) were inpatients. Fifty-two patients had one ulcer and the rest had multiple ulcers. The mean size of the ulcers was 8.4 ± 7.3 mm (standard deviation). Fifty-three patients (48.7%) were actively taking NSAIDs, 41 (36.3%) were not taking NSAIDs and 17 (15%) had no documentation of whether they were on NSAIDs. *H. pylori* was positive (whether by serology or biopsy) in 17 (15%) patients, negative in 89 patients (78.7%), and was not tested in 7 patients (6.3%).

Twenty-five (22%) GUs were biopsied at initial EGD and of these, 23 were benign and 2 were adenocarcinomas. Four (3.5%) GUs appeared endoscopically suspicious for malignancy and these suspicious-looking GUs were biopsied at index EGD. Of these, two were adenocarcinomas, one was a fungal infection, and one was benign.

Upon completion of the index EGD, repeat EGD in 8 to 12 weeks was recommended for 96 (85%) patients. *H. pylori* was positive in 15 of the 96 patients and negative in 74. Forty-six patients were actively taking NSAIDs, 35 were not taking NSAIDs, and no documentation was present in 13 patients regarding whether they were taking NSAIDs. Of the 96 patients, 72 (64%) underwent repeat EGD at our institution. There were not enough data to determine whether the remaining 24 patients (21%) were lost to follow-up or underwent EGD at another facility.

Among the 72 patients who underwent surveillance, 20 had a biopsy at index endoscopy; the GU was still present in 9 patients, and was completely healed or healing in 63 patients. In the nine patients with GU on repeat EGD, seven GUs disappeared on repeat EGD and two patients were lost to follow-up after their third EGD. In both of these cases, the GU still appeared in the third EGD.

Discussion

Although there is a lack of substantial data to support routine endoscopic surveillance for GUs, the 2010 ASGE guidelines recommend performing biopsies of all GUs routinely to exclude malignancy (because benign-looking GUs may be malignant).[17] The decision, however, to perform a biopsy and endoscopic surveillance of GU should be individualized. For example, for GUs that appear benign at initial EGD, are confirmed on biopsy with a defined etiology of PUD (eg, related to NSAIDs or *H. pylori*), and patients become asymptomatic after a course of appropriate therapy, surveillance endoscopy may be unnecessary. Conversely, GUs that endoscopically appear suspicious for malignancy should be biopsied and undergo surveillance, even if the initial biopsy is negative. As such, the ASGE suggests endoscopic surveillance for GUs in patients who remain symptomatic, despite adequate medical therapy, in patients with GUs of unclear etiology, and in patients who did not undergo biopsy at initial upper endoscopy.

It also is reasonable to consider endoscopic surveillance if the initial histology was inadequate, or when risk factors for malignancy are present,[17,19–21] such as age older than 50 years; the presence of *H. pylori*; migration from a region with a high prevalence of gastric cancer; family history of gastric cancer; large GU; and the presence of gastric atrophy, adenoma, dysplasia, possible intestinal metaplasia, and low serum pepsinogen.

In a survey of Canadian endoscopists published in 1999, > 60% reported that they perform surveillance EGD routinely in patients with a GU.[22] A review of the Clinical Outcomes Research Initiative database of 6113 ambulatory patients diagnosed between 2001 and 2005 as having a GU showed that surveillance EGD was performed in 1510 patients (24.7%). Older patients were more likely than younger patients to undergo surveillance, although a substantial minority (15.2%) of patients younger than 40 years underwent a surveillance examination. Index ulcer size ≥1 cm and care in a Veterans Affairs Medical Center setting also were independent predictors of surveillance EGD use. Significant geographic variation was noted, with surveillance rates varying from 16.0% to 35.9% across the United States.[18]

It is notable that our endoscopists were able to suspect malignancy from the endoscopic appearance of the two histology-proven GUs. One of the reasons for this could be the use of the recently introduced high-definition endoscopes, which allow better characterization of the tissue in question. Reports on image-enhanced endoscopy (eg, magnifying endoscopy with narrow-band imaging) also have shown some encouraging results in improving the diagnosis of gastric malignancy.[23] This rapidly developing field of image-enhanced endoscopy may play a significant role in improving the sensitivity of endoscopy for the diagnosis of malignant GUs.[24]

Possible reasons for the overuse of endoscopic surveillance include lack of knowledge about guidelines, disagreement with guidelines, medicolegal concerns, and financial gain. At our institution, the rate of endoscopic surveillance is significantly higher than the national rate (64% vs 25%), although such a high rate of surveillance did not reveal any additional gastric malignancy. This finding supports the evidence regarding the low yield of routine surveillance. It should be noted that the difference between our rate and the national average could result from the small sample size in our study (6113 vs 113 cases) and the fact that we included inpatients, whereas the study by Saini et al included only outpatients.[16] Our rate of GU biopsies at initial EGD is 22%, which reflects endoscopists' mostly recommending surveillance over performing biopsies at initial EGD. Obtaining biopsies from all GUs at initial EGD may be a safer approach; 21% of our patients were lost to follow-up and may not have undergone repeat EGD. Endoscopic surveillance resulted in multiple EGDs (up to six) in nine patients to ensure healing, and this adds to the cost and risks involved with repeated procedures.

The ASGE recommends testing for the presence of *H. pylori* in all patients with PUD. The rate of *H. pylori* testing in our sample of GUs was 94%, which reflects high adherence to the strategy of testing and treating with antibiotics if the result is positive.

The limitations of our study include it being a retrospective analysis in a low-prevalence area for gastric cancer, which has resulted in a relatively small sample of patients; however, this likely represents practice settings in most places across the United States. The actual rate of endoscopic surveillance may be even higher. The 21% who did not receive follow-up EGD at our institution may have undergone follow-up EGD at a different facility.

Conclusions

Although guidelines discourage routine EGD surveillance for patients with EGD, it is still a common practice; at our institution, the rate of endoscopic surveillance was significantly higher than the national rate (64% vs 25%). Such a high rate of surveillance did not reveal any additional gastric cancer, which adds further evidence to the low yield of routine surveillance. Alternatively, the rate of biopsy of GUs at initial EGD is low (22%), reflecting the fact that endoscopists mostly recommend surveillance over performing biopsies at initial EGD. Unnecessary surveillance for GUs could have significant implications for the cost of care for patients with GUs and the subjection of patients to the unnecessary risks of repeat endoscopies.

Acknowledgment

The authors thank Neil Hockley for providing the lists of gastric ulcers and relevant data.

References

1. Sung JJ, Kuipers EJ, El-Serag HB. Systematic review: the global incidence and prevalence of peptic ulcer disease. *Aliment Pharmacol Ther* 2009; 29:938–946.
2. Akdamar K, Ertan A, Agrawal NM, et al. Upper gastrointestinal endoscopy in normal asymptomatic volunteers. *Gastrointest Endosc* 1986;32:78–80.
3. Aro P, Storskrubb T, Ronkainen J, et al. Peptic ulcer disease in a general adult population: the Kalixanda study: a random population-based study. *Am J Epidemiol* 2006;163:1025–1034.
4. Bernersen B, Johnsen R, Straume B, et al. Towards a true prevalence of peptic ulcer: the Sorreisa gastrointestinal disorder study. *Gut* 1990;31:989–992.
5. Maniatis AG, Eisen GM, Brazer SR. Endoscopic discrimination of gastric ulcers. *J Clin Gastroenterol* 1997;24:203–206.
6. Bustamante M, Devesa F, Borghol A, et al. Accuracy of the initial endoscopic diagnosis in the discrimination of gastric ulcers: is endoscopic follow-up study always needed? *J Clin Gastroenterol* 2002;35:25–28.
7. Arroyo MT, Forne M, de Argila CM, et al. The prevalence of peptic ulcer not related to *Helicobacter pylori* or non-steroidal anti-inflammatory drug use is negligible in southern Europe. *Helicobacter* 2004;9:249–254.
8. Nishikawa K, Sugiyama T, Kato M, et al. Non-*Helicobacter pylori* and non-NSAID peptic ulcer disease in the Japanese population. *Eur J Gastroenterol Hepatol* 2000;12:635–640.
9. Chan TO, Kuo YC, Chien RN, et al. Gastric adenocarcinoma simulating benign gastric ulcer. *Changgeng Yi Xue Za Zhi* 1992;15:59–63.
10. Podolsky I, Storms PR, Richardson CT, et al. Gastric adenocarcinoma masquerading endoscopically as benign gastric ulcer. A five-year experience. *Dig Dis Sci* 1988;33:1057–1063.
11. Pruitt RE, Truss CD. Endoscopy, gastric ulcer, and gastric cancer. Follow-up endoscopy for all gastric ulcers? *Dig Dis Sci* 1993;38:284–288.
12. Graham DY, Schwartz JT, Cain GD, et al. Prospective evaluation of biopsy number in the diagnosis of esophageal and gastric carcinoma. *Gastroenterology* 1982;82:228–231.
13. Eckardt VF, Giessler W, Kanzler G, et al. Does endoscopic follow-up improve the outcome of patients with benign gastric ulcers and gastric cancer? *Cancer* 1992;69:301–305.
14. Bytzer P. Endoscopic follow-up study of gastric ulcer to detect malignancy: is it worthwhile? *Scand J Gastroenterol* 1991;26:1193–1199.
15. Surveillance, Epidemiology, and End Results Program. SEER cancer statistics review 1975-2006. http://seer.cancer.gov/csr/1975_2006. Accessed February 15, 2013.
16. Cohen J, Safdi MA, Deal SE, et al. Quality indicators for esophagogastroduodenoscopy. *Am J Gastroenterol* 2006;101:886–891.
17. ASGE Standards of Practice Committee, Banerjee S, Cash BD, et al. The role of endoscopy in the management of patients with peptic ulcer disease. *Gastrointest Endosc* 2010;71:663–668.
18. Saini SD, Eisen G, Mattek N, et al. Utilization of upper endoscopy for surveillance of gastric ulcers in the United States. *Am J Gastroenterol* 2008;103:1920–1925.
19. Hosokawa O, Watanabe K, Hatorri M, et al. Detection of gastric cancer by repeat endoscopy within a short time after negative examination. *Endoscopy* 2001;33:301–305.
20. Whiting JL, Sigurdsson A, Rowlands DC, et al. The long term results of endoscopic surveillance of premalignant gastric lesions. *Gut* 2002; 50:378–381.
21. Kitahara F, Kobayashi K, Sato T, et al. Accuracy of screening for gastric cancer using serum pepsinogen concentrations. *Gut* 1999;44:693–697.
22. Breslin NP, Sutherland LR. Survey of current practices among members of CAG in the follow-up of patients diagnosed with gastric ulcer. *Can J Gastroenterol* 1999;13:489–493.
23. Savarino E, Corbo M, Dulbecco P, et al. Narrow-band imaging with magnifying endoscopy is accurate for detecting gastric intestinal metaplasia. *World J Gastroenterol* 2013;19:2668–2675.
24. Kim KO, Ku YS. Is image-enhanced endoscopy useful for the diagnosis and treatment of gastrointestinal tumor? *Clin Endosc* 2013;46:248–250.