Safety of esophageal EMR in elderly patients

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Background: EMR is commonly used to remove suspicious esophageal lesions among patients with Barrett's esophagus (BE). BE primarily affects older patients. Yet, the safety profile of EMR in elderly patients has not been well-described.

Objective: We aimed to study the safety profile of EMR in elderly patients compared with younger patients.

Design: Retrospective, observational, descriptive study that used a prospective database.

Setting: Tertiary-care referral center.

Patients: A total of 136 patients who underwent esophageal EMR for BE.

Interventions: EMR with/without ablative therapy.

Main Outcome Measurements: The rate of adverse events, including bleeding, stricture formation, and perforation between elderly (aged $\geq$75 years) and younger (aged $<$75 years) patients.

Results: We identified 136 patients who underwent esophageal EMR who were followed-up in our clinic. Of those, 40% (n = 55) were aged $\geq$75 years (elderly group) and 60% (n = 81) were aged $<$75 years (younger group). There was no difference in rate of stricture formation or early or delayed bleeding when we compared elderly patients to younger patients. None of the patients had esophageal perforation. On multivariable logistic regression analysis, controlling for patient sex, EMR technique, and underlying pathology, older age was not associated with increased odds of adverse events (OR 0.88; 95% confidence interval, 0.42-1.9; P = .75).

Limitations: Single-center experience.

Conclusion: Rates of adverse events from EMR appear to be similar in elderly patients compared with younger patients. Overall, esophageal EMR seems to offer an acceptable safety profile in elderly patients. (Gastrointest Endosc 2014;80:586-91.)

(footnotes appear on last page of article)

Barrett's esophagus (BE) primarily affects older patients. Yet, the safety profile of EMR in elderly patients has not been well-described. Therefore, we aimed to study the rate of adverse events after EMR among elderly patients (aged $\geq$75 years) compared with younger patients (aged $<$75 years).

As the incidence of esophageal adenocarcinoma increases, methods to endoscopically remove suspicious esophageal lesions have gained increased acceptance.[1-4] This is especially true among patients with BE.[4] Endoscopic therapy for patients with BE and dysplasia include EMR and endoscopic submucosal dissection (ESD) in addition to various ablative modalities like radiofrequency ablation (RFA), photodynamic therapy, cryotherapy, or argon plasma coagulation.[5-11] In addition to its use in removing the suspicious lesion, EMR is useful in histologic staging of esophageal cancers.[12] Adverse events from EMR include stricture formation (up to 70% of patients), bleeding, and perforation.

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METHODS

Data collection

This was a retrospective, descriptive study that used a prospective EMR database at a large-volume, tertiary-care

referral center. The data set has been previously described.[13] In this data set, we had a total of 136 unique patients who have had EMR of the esophagus. Indications for EMR included high-grade dysplasia (HGD), early adenocarcinoma, or esophageal nodules in the setting of BE, which were performed between May 2003 and June 2010. All patients had follow-up endoscopy after EMR. Adverse events were documented at the follow-up appointment. We used the database and electronic medical records. For each patient, we extracted data on patient age, sex, type of EMR, bleeding, stricture formation, admission to the hospital within 30 days, and perforation. We defined early bleeding as bleeding that happened during the procedure that required an intervention, such as clip placement or cautery. Delayed bleeding was reported if the patient reported melena, hematemesis, or hematochezia or if there was a drop in hemoglobin level by >2 g within 30 days after the procedure.

The primary outcome was the development of adverse events after EMR compared between elderly patients and younger patients.

Standard protocol

Our standard protocol has been previously described in detail.[13] Once referred to our center, patients were evaluated by an expert endoscopist before undergoing EGD. In many cases, advanced imaging modalities were used during the EGD (narrow-band imaging and probe-based confocal endomicroscopy). At a later date, patients had an EUS for staging purposes.

Among patients who had no evidence of invasive disease beyond the submucosa or into the lymph nodes, EMR was used to remove suspicious areas. Patients then underwent RFA with the goal of eradication of intestinal metaplasia.

EMR

Details of our EMR protocol have been previously described.[14,15] The preferred method of EMR in the esophagus at our center is the multiband mucosectomy method (Duette, DT-6-5F; Cook Medical, Bloomington, Ind) as seen in Figure 1. For large lesions, we perform from 4 to 6 additional resections around the index lesion—we term this the "rosette pattern." This usually resulted in resection of about 75% of the luminal circumference. We used argon plasma coagulation to fulgurate any remaining bridges or edges. We used the cap technique from Olympus accessories (K-008; Olympus America Inc, Center Valley, Penn) in a small number of patients based on physician preference. We defined a stricture as narrowing in the lumen of the esophagus based on EGD, regardless of the symptoms. We classified severity as mild if there was easy passage of a standard endoscope (Olympus GIF H-180, outer diameter 9.8 mm; Olympus), moderate if there was resistance to passing the endoscope, and severe if we could not pass the standard diagnostic endoscope.

Take-home Message

- Esophageal EMR appears to be safe and well-tolerated among very elderly patients.

Dilations were mostly performed by using Savary-Gilliard dilators with a guidewire (Cook Medical, Bloomington, Ind). By protocol, all patients were asked to hold aspirin and/or clopidogrel for 5 to 7 days before the procedure and to resume such medications from 3 to 5 days after the procedure. Patients taking warfarin had to stop it 5 to 7 days before the procedure. International normalized ratio was checked within 24 hours of the procedure to be 1.5 or less. "Bridge" anticoagulation was used as necessary in high-risk patients by using low molecular weight heparin.

Statistical analysis

We used SAS 9.2 (SAS Institute Inc, Cary, NC) for statistical analysis. We compared the rate of adverse events between elderly (aged ≥ 75 years) and younger (aged <75 years) patients by using chi-square or Fisher exact tests. For continuous variables, we used the Wilk-Shapiro test to assess normality. For normal variables, we reported means and standard deviations. For non-normal data, we reported medians and ranges or interquartile ranges (IQR). We used the t test to assess for differences between two means for normal data, whereas we used the Wilcoxon rank sum test for continuous non-normal data. We used multivariable logistic regression analysis to assess the association between age and the rate of adverse events. Variables were included in the final model if they were clinically relevant or if they reached significance in univariate analysis, with $P < .20$. This study was reviewed and approved by the Mayo Clinic Institutional Review Board.

RESULTS

A total of 175 patients underwent EMR at our center between May 2003 and June 2010. Of those, 136 patients had a minimum of 1 follow-up EGD at our center. Those patients formed our study population. Indications for the procedure were esophageal nodules and/or lesions, BE with HGD, or suspected intramucosal carcinoma. None of those patients were excluded from our analysis. Of those, 40% (n = 55) were aged ≥ 75 years (elderly group). Median age for patients in the elderly group was 80 years (range 75-89, IQR 77-83) versus 64 years (range 40-74, IQR 59-70) for the younger group ($P < .0001$). The majority of patients in both groups were male (84% vs 85%; $P = .8$). As seen in Table 1, the two groups had similar baseline characteristics. Median size of the resected lesion was 1 cm (range 0.3-3.6 cm, IQR 0.8-2 cm) for the elderly group compared with 1.2 cm (range 0.3-7 cm, IQR 0.8-2 cm)