Therapeutic outcomes of endoscopic submucosal dissection of differentiated early gastric cancer in a Western endoscopy setting (with video)

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Background: Large multicenter gastric cancer endoscopic submucosal dissection (ESD) studies conducted at major Japanese institutions have reported en bloc resection, en bloc tumor-free margin resection, and curative resection rates of 92.7% to 96.1%, 82.6% to 94.5%, and 73.6% to 85.4%, respectively, with delayed bleeding and perforation rates of 0.6% to 6.0% and 3.6% to 4.7%, respectively. Although ESD is currently an alternative treatment in some countries, particularly in Asia, it remains uncertain whether ESD therapeutic outcomes in Western endoscopy settings can be comparable to those achieved in Japan.

Objective: To evaluate the ESD therapeutic outcomes for differentiated early gastric cancer (EGC) in a Western endoscopy setting.

Design/Setting: Consecutive case series performed by an expertly trained Western endoscopist.

Patients: Fifty-three patients with 54 lesions.

Interventions: ESD for early gastric cancers (T1) satisfying expanded inclusion criteria.

Main Outcome Measurements: En bloc resection, en bloc tumor-free margin resection, and curative resection rates were 98%, 93%, and 83%, respectively. The delayed bleeding rate was 7%, and the perforation rate was 4%.

Results: The mean patient age was 67 years, and the mean tumor size was 19.8 mm, with 54% of the lesions located in the lesser curvature. The median procedure time was 61 minutes, with ESD procedures 60 minutes or longer associated with submucosal fibrosis ($P < .001$) and tumor size 25 mm or larger ($P = .03$). In every ESD procedure, both circumferential incision and submucosal dissection were performed by using a single knife. Two of the 4 delayed bleeding cases required surgery, and all perforations were successfully managed by using endoscopic clips.

Limitation: Long-term outcome data are currently unavailable.

Conclusion: ESD for differentiated EGC resulted in favorable therapeutic outcomes in a Western endoscopy setting comparable to those achieved at major Japanese institutions. (Gastrointest Endosc 2015;82:804-11.)

(footnotes appear on last page of article)

BACKGROUND

Gastric cancer ranks as the most common malignant tumor in East Asia, Eastern Europe, and parts of Latin America.[1] Although the incidence and mortality have decreased in the United States over the past 35 years, it is estimated that the disease will be diagnosed in approximately 21,600 Americans and that 10,990 will die of the disease in 2014.[2] As in many other Latin American countries, gastric cancer is the main cause of cancer-related deaths in Colombia, with an estimated 7700 new cases every year, with the majority of those cases diagnosed at an advanced stage.[3,4] Key factors in reducing mortality and morbidity, respectively, are early diagnosis and curative endoscopic treatment. Endoscopic submucosal dissection (ESD) was pioneered by Japanese endoscopists and revolutionized the management of early gastric cancer (ECG). ESD

This video can be viewed directly from the GIE website or by using the QR code and your mobile device. Download a free QR code scanner by searching "QR Scanner" in your mobile device's app store.

has a low risk of lymph-node metastasis and is widely accepted as a minimally invasive, safe, and curative procedure.[5,6] En bloc resection is the major advantage of ESD over conventional EMR because it facilitates precise histological assessment, reduces tumor recurrence, and provides higher curability rates.[7]

Large multicenter gastric cancer ESD studies at major Japanese institutions have reported en bloc resection rates of 92.7% to 96.1%,[8,9] en bloc tumor-free margin resection rates of 82.6% to 94.5%,[8,9] and curative resection rates of 73.6% to 85.4%.[9,10] Those studies have also reported delayed bleeding rates of 0.6% to 6%[5,10] and perforation rates of 3.6% to 4.7%.[5,10] Although ESD is currently an alternative treatment for EGC in some countries, particularly in Asia, it is still uncertain whether therapeutic outcomes of ESD when performed by suitably trained Western endoscopists are comparable to those achieved at major Japanese institutions. The aim of this study, therefore, was to assess the therapeutic outcomes of ESD for differentiated EGC in a Western endoscopy setting located in Bogotá, Colombia.

MATERIAL AND METHODS

Patients and institutions

A total of 54 differentiated EGCs in 53 consecutive patients were treated in Bogotá by ESD at either the EmuraCenter LatinoAmerica or Clínica Universitaria Colombia from October 2007 to September 2014. The EmuraCenter has served as a reference facility since 2007, where highly qualified local and Japanese endoscopists have provided training in specific endoscopic techniques such as narrow-band imaging,[11] magnifying colonoscopy,[12] ESD,[13,14] and systematic alphanumeric coded endoscopy (SACE).[15] Informed consent was obtained from all patients, and the study was approved by the respective institutional review boards. An anesthesiologist administered either intravenous sedation with midazolam and/or propofol or general anesthesia.

Endoscopist's training background

The Western endoscopist participating in this series (F.E.) was formally trained at the National Cancer Center Hospital in Tokyo, Japan, for 2 years (2003-2005) in a gastroenterology and endoscopy practice focused on therapeutic procedures. His ESD training consisted of a step-by-step approach encompassing upper GI endoscopy with an emphasis on EGC diagnosis and ESD indications, diagnostic and therapeutic colonoscopy, observing and assisting in more than 300 ESD procedures, performing at least 25 successful ESDs on ex vivo porcine models, and then performing ESDs on gastric lesions under the close supervision of highly experienced endoscopists.

Diagnosis of EGC

Endoscopic examination was indicated for both symptomatic patients and screening purposes. SACE was routinely used for diagnosis.[15] A mixture of *N*-acetylcysteine to dissolve the overlying superficial mucus and polydimethylsiloxane to remove saliva bubbles was administered 20 minutes before the endoscopy examination.[16,17] Chromoendoscopy was performed to clearly distinguish the margins of the lesions by using a 0.25% solution of indigo carmine dye injected directly into the working channel of the endoscope with a 20-mL disposable syringe.[18] For all referral cases, an additional preoperative evaluation was conducted for endoscopic confirmation of the margins and to determine the appropriate ESD strategy to be used on each patient. All lesions were considered to be early cancers also referred to as T1 cancers because they were confined to the mucosa or submucosa based on both endoscopic findings and subsequent pathological analysis. Each lesion demonstrated either differentiated adenocarcinoma or high-grade dysplasia (HGD). EUS was used to estimate the depth of invasion in selected cases.[19] The location was divided into the pyloric channel, antrum, angulus, lower third, middle third, and upper third according to a classification proposed by Emura et al.[15] The cross-sectional position on the circumference was divided into the anterior wall, lesser curvature, posterior wall, and greater curvature.[20] If a lesion extended beyond a particular wall or curvature, its cross-sectional position was based on the location of the larger portion of the lesion. Macroscopic types were determined based on the Paris classification.[21]

Indications for ESD

All lesions satisfied the expanded indications criteria proposed by the National Cancer Center Hospital guidelines for ESD.[22]

ESD technique

Procedures were performed by using an Olympus GIF H-180 video endoscope (Olympus Optical Co, Ltd, Tokyo, Japan), a standard video endoscope system (EVIS EXERA II; Olympus), and an ERBE ICC-200 (ERBE Elektromedizin GmBH, Tübingen, Germany) frequency generator. Marking around the lesions was performed by using a conventional needle-knife. A mixture of normal saline solution, indigo carmine dye, and epinephrine was then injected into the submucosal (SM) layer with Glycerol (Chugai Pharmaceutical Co, Tokyo, Japan)[23] used in selected cases. After making a mucosal cut, a circumferential mucosal incision separated the lesion from the underlying healthy tissue followed by SM dissection by using an IT-Knife2 (KD-611L; Olympus) (Video 1, available online at www.giejournal.org).[24] A soft, straight, and transparent attachment (D-201-11304; Olympus) to facilitate observation of the SM layer was used