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## Second-Look Endoscopy after Endoscopic Submucosal Dissection: Can We Obtain Valuable Information?

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See "Usefulness of the Forrest Classification to Predict Artificial Ulcer Rebleeding during Second-Look Endoscopy after Endoscopic Submucosal Dissection" by Duk Su Kim, Yunho Jung, Ho Sung Rhee, et al., on page 273-281.

Endoscopic mucosal resection (EMR) and endoscopic submucosal dissection (ESD) are curative techniques for gastric neoplasm; ESD has advantages over EMR regarding *en bloc* resection of large-sized lesions and submucosal fibrosis.<sup>1-4</sup>

Although ESD is widely considered a safe technique, complications including bleeding and perforation remain major concerns. While coagulation therapy after ESD and the use of proton pump inhibitor (PPI) premedication have gradually decreased the frequency of delayed bleeding, delayed bleeding still occurs in about 5% of cases.<sup>5-7</sup> Therefore, it is clinically important to prevent delayed bleeding.

Endoscopic findings of peptic ulcer bleeding, including active or recent hemorrhage, are classified by using the Forrest classification,<sup>8</sup> a well-known and useful tool for evaluating and predicting the risk of recurrent bleeding following endoscopic hemostasis.<sup>9</sup> Peptic ulcers with a Forrest classification from Ia (spurting arterial vessel) to IIb (adherent clot) are more likely to rebleed after initial hemostasis; endoscopic hemostasis during the first endoscopy is recommended to prevent rebleeding from these lesions.<sup>10,11</sup> In addition, sec-

ond-look endoscopy (SLE) is reported as useful in preventing rebleeding in patients with high-risk peptic ulcer bleeding.<sup>12,13</sup> Therefore, to evaluate post-ESD bleeding and achieve hemostasis of high-risk lesions, SLE is commonly performed in many hospitals after ESD. However, the use of SLE after ESD is still controversial.

Although a recent retrospective study reported the usefulness of SLE for preventing post-ESD bleeding on the basis of less frequent delayed bleeding after SLE (one case in 432 patients vs. eight cases in 440 patients),<sup>14</sup> other studies have reported the non-significant effect of SLE on clinical outcomes including delayed bleeding.<sup>5,15,16</sup> Furthermore, one prospective study suggested that prophylactic coagulation for post-ESD ulcers with a high-risk Forrest classification may have minor effects on preventing delayed bleeding.<sup>17</sup>

One major difference between peptic ulcers and post-ESD ulcers is the conditions associated with their formation.<sup>18</sup> Peptic ulcers are usually associated with low gastric pH; rebleeding is more likely to occur in patients with these ulcers. Therefore, SLE for peptic ulcer bleeding is considered useful. PPI premedication relatively raises the pH of the post-ESD ulcers' environment, and heals post-ESD ulcers faster than peptic ulcers. However, the risk of rebleeding may be decreased, irrespective of the use of preventive hemostasis on post-ESD ulcers.<sup>17-19</sup>

Despite this controversy, it is difficult to recommend discontinuing SLE and many endoscopists continue to perform SLE in their clinics. What valuable information, if any, can we obtain from SLE? Can we predict delayed bleeding by using

Received: April 19, 2016 Accepted: April 27, 2016

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SLE? As described in this issue of *Clinical Endoscopy*, Kim et al.<sup>20</sup> retrospectively analyzed 581 lesions to study delayed bleeding following SLE. To predict delayed post-ESD bleeding, they focused on the usefulness of the Forrest classification of post-ESD ulcers during SLE. To investigate recent hemorrhage or potential bleeding, each SLE was performed one day after each ESD; the post-ESD ulcers were classified according to the Forrest classification. Using these post-ESD ulcer classifications, they then determined bleeding rates after SLE. When post-ESD ulcers with high-risk Forrest classifications were observed, the endoscopists made subjective decisions regarding performing prophylactic hemostasis. Delayed post-ESD bleeding occurred in 42 of the 581 patients (7.2%). During SLE, Forrest Ib, Ila, and IIb ulcers were identified in 8.2%, 8.0%, and 13.7% of cases, respectively. All Forrest Ia lesions were diagnosed by emergency bleeding occurring within 24 hours of performing ESD, and no Forrest Ia lesions were found during SLE. Multivariate analyses determined that a specimen size  $\geq 40$  mm (odds ratio [OR], 3.03;  $p=0.003$ ), and a high-risk Forrest classification (Forrest Ib+Ila+IIb; OR, 6.88;  $p<0.001$ ) were risk factors for delayed post-ESD bleeding. In accordance with a previous study,<sup>17</sup> the rate of delayed post-ESD bleeding was not significantly different between the prophylactic hemostasis and non-hemostasis groups.

Based on this study, Forrest classification of post-ESD ulcers may be useful in predicating a high risk of delayed post-ESD bleeding, but routine prophylactic hemostasis for post-ESD ulcers with a high-risk Forrest classification during SLE is not useful in preventing delayed post-ESD bleeding. Predicting a high risk of delayed post-ESD bleeding may help physicians establish therapeutic plans, influence decision timing for oral intake/discharge, and assist them in efforts to educate their patients on taking regular medications such as PPIs, or on visiting the hospital as soon as possible if associated symptoms develop. However, this doesn't mean that SLE should be done in all patients. Therefore, future prospective studies are needed to define subjects with a high risk of delayed post-ESD bleeding, in whom SLE is needed.

#### Conflicts of Interest

The authors have no financial conflicts of interest.

## REFERENCES

- Soetikno R, Kaltenbach T, Yeh R, Gotoda T. Endoscopic mucosal resection for early cancers of the upper gastrointestinal tract. *J Clin Oncol* 2005;23:4490-4498.
- Ono H, Kondo H, Gotoda T, et al. Endoscopic mucosal resection for treatment of early gastric cancer. *Gut* 2001;48:225-229.
- Isomoto H, Shikuwa S, Yamaguchi N, et al. Endoscopic submucosal dissection for early gastric cancer: a large-scale feasibility study. *Gut* 2009;58:331-336.
- Park YM, Cho E, Kang HY, Kim JM. The effectiveness and safety of endoscopic submucosal dissection compared with endoscopic mucosal resection for early gastric cancer: a systematic review and metaanalysis. *Surg Endosc* 2011;25:2666-2677.
- Takahashi F, Yoshitake N, Akima T, et al. A second-look endoscopy may not reduce the bleeding after endoscopic submucosal dissection for gastric epithelial neoplasm. *BMC Gastroenterol* 2014;14:152.
- Higashiyama M, Oka S, Tanaka S, et al. Risk factors for bleeding after endoscopic submucosal dissection of gastric epithelial neoplasm. *Dig Endosc* 2011;23:290-295.
- Takizawa K, Oda I, Gotoda T, et al. Routine coagulation of visible vessels may prevent delayed bleeding after endoscopic submucosal dissection: an analysis of risk factors. *Endoscopy* 2008;40:179-183.
- Forrest JA, Finlayson ND, Shearman DJ. Endoscopy in gastrointestinal bleeding. *Lancet* 1974;2:394-397.
- Guglielmi A, Ruzzenente A, Sandri M, et al. Risk assessment and prediction of rebleeding in bleeding gastroduodenal ulcer. *Endoscopy* 2002;34:778-786.
- Lin HJ, Lee FY, Kang WM, Tsai YT, Lee SD, Lee CH. A controlled study of therapeutic endoscopy for peptic ulcer with non-bleeding visible vessel. *Gastrointest Endosc* 1990;36:241-246.
- Lu Y, Chen YI, Barkun A. Endoscopic management of acute peptic ulcer bleeding. *Gastroenterol Clin North Am* 2014;43:677-705.
- El Ouali S, Barkun AN, Wyse J, et al. Is routine second-look endoscopy effective after endoscopic hemostasis in acute peptic ulcer bleeding? A meta-analysis. *Gastrointest Endosc* 2012;76:283-292.
- Kim SB, Lee SH, Kim KO, et al. Risk factors associated with rebleeding in patients with high risk peptic ulcer bleeding: focusing on the role of second look endoscopy. *Dig Dis Sci* 2016;61:517-522.
- Kim HH, Park SJ, Park MI, Moon W. Clinical impact of second-look endoscopy after endoscopic submucosal dissection of gastric neoplasms. *Gut Liver* 2012;6:316-320.
- Kim JS, Chung MW, Chung CY, et al. The need for second-look endoscopy to prevent delayed bleeding after endoscopic submucosal dissection for gastric neoplasms: a prospective randomized trial. *Gut Liver* 2014;8:480-486.
- Ryu HY, Kim JW, Kim HS, et al. Second-look endoscopy is not associated with better clinical outcomes after gastric endoscopic submucosal dissection: a prospective, randomized, clinical trial analyzed on an as-treated basis. *Gastrointest Endosc* 2013;78:285-294.
- Na S, Ahn JY, Choi KD, et al. Delayed bleeding rate according to the Forrest classification in second-look endoscopy after endoscopic submucosal dissection. *Dig Dis Sci* 2015;60:3108-3117.
- Goto O, Fujishiro M, Kodashima S, et al. A second-look endoscopy after endoscopic submucosal dissection for gastric epithelial neoplasm may be unnecessary: a retrospective analysis of postendoscopic submucosal dissection bleeding. *Gastrointest Endosc* 2010;71:241-248.
- Goto O, Fujishiro M, Kodashima S, et al. Short-term healing process of artificial ulcers after gastric endoscopic submucosal dissection. *Gut Liver* 2011;5:293-297.
- Kim DS, Jung Y, Rhee HS, et al. Usefulness of the Forrest classification to predict artificial ulcer rebleeding during second-look endoscopy after endoscopic submucosal dissection. *Clin Endosc* 2016;49:273-281.