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## Commentary on “Efficacy of Endoscopic Submucosal Dissection of Esophageal Neoplasms under General Anesthesia”

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See “Efficacy of Endoscopic Submucosal Dissection of Esophageal Neoplasms under General Anesthesia” by Koichi Hamada, Koichiro Kawano, Atsushi Yamauchi, et al., on page 252-257.

Esophageal cancer affects more than 450,000 people worldwide, and its incidence has increased owing to aging and population growth.<sup>1</sup> With advances in endoscopic techniques, the use of endoscopic submucosal dissection (ESD) procedures as an alternative to surgical treatment for patients with node-negative early esophageal cancer is also increasing, and the favorable outcomes of ESD for esophageal cancer have been reported.<sup>2-5</sup>

The demand for esophageal ESD has been increasing especially for older patients or those with comorbidities because of the risk of morbidity and mortality associated with esophageal surgery. Therefore, finding strategies for performing esophageal ESD more effectively and safely is important. For stable procedures, several methods have been introduced and attempted. For example, carbon dioxide gas is known to reduce the procedure time, abdominal pain, and complications after the procedure because it is absorbed more rapidly than room air.<sup>6-8</sup> General anesthesia (GA) could also be performed in a stable procedure by minimizing patient movement induced by breathing or belching, and the risk of aspiration pneumonia

is expected to be reduced by applying positive pressure. The effectiveness of ESD under GA was reported in some studies on gastric and esophageal ESD.<sup>9-11</sup> By analyzing 39 esophageal and 66 gastric ESD procedures, Rong et al.<sup>12</sup> reported that ESD under GA was associated with a shorter procedure time and higher rate of patient satisfaction than midazolam sedation. Yamashita et al.<sup>13</sup> reported that the complication rate of ESD under GA was 0.0% in esophageal ESD, 3.3% in gastric ESD, and 5.9% in colon ESD. Most recently, after analyzing 175 cases of esophageal ESD, a Korean study reported that ESD under GA was associated with a higher complete resection rate and lower perforation rate than conscious sedation.<sup>14</sup>

The article in this issue of *Clinical Endoscopy* by Hamada et al. reported an evaluation of the efficacy and safety of esophageal ESD under GA, based on 198 cases of endoscopic procedures.<sup>15</sup> The authors found that although the lesion and ulcer sizes were larger in GA, the procedure was performed faster in the GA group than in the deep sedation (DS) group. Thus, they suggested that ESD can be performed in a more stable condition under GA than under DS.

This study shows some clinical important points. The GA group had fewer adverse complications than the DS group and had no event of perforation or aspiration pneumonia. Even if significant comparison is difficult owing to the small number of cases, the complications are clinically meaningful because they can have fatal outcomes. In this study, ESD under GA was performed at higher rates for upper esophageal lesions than for lower esophageal lesions. The upper esophageal sphincter is stimulated more often during the upper

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esophageal procedure. Therefore, it may lead to increased risks of aspiration and belching in patients. Endotracheal intubation can prevent these risks, thereby enabling more stable operations and lower complications. Therefore, GA may be a more useful method for upper esophageal lesions. On the basis of this paper, future study about the evaluation of clinical factors that are more advantageous for GA, such as lesion location, must be considered.

This study can be improved if complemented with some explanation. For objective assessment of the degree of sedation, a more detailed explanation of the sedation level (e.g., Modified Observer's Alertness/Sedation scale) is needed. If additional drug is indicated during the procedure and information about the total sedative drug dosage in GA is provided, we could interpret the quality of sedation more clearly and identify which method is more advantageous for reducing drug dose. Assessments of recovery and satisfaction are also important to evaluate the quality of the outcome. Therefore, for the procedure to be more effective for clinical application, the recovery time and satisfaction of both the operator and patient after the procedure must be further analyzed. Comparison of the total time needed for one procedure, for example, from the time of administration for sedation to the full recovery time of patients, will also be meaningful.

This paper is regarded as a reasonable study considering the increasing demand for esophageal ESD. As the number of institutions implementing esophageal ESD under GA is increasing, more randomized controlled studies to investigate the long-term outcome of esophageal ESD should be conducted.

#### Conflicts of Interest

The authors have no financial conflicts of interest.

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