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Management and risk factor of stenosis after endoscopic submucosal dissection for colorectal neoplasms

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Background and Aim: Although endoscopic submucosal dissection (ESD) enables en bloc removal of large colorectal neoplasms, the incidence of stenosis after ESD and its risk factors have not been well described. This study aimed to determine the risk factors of stenosis and verify the surveillance and treatment of stenosis.

Methods: This retrospective study included 822 patients, with a total of 912 consecutive colorectal lesions, who underwent ESD from September 2003 to May 2015. The main outcome measures were incidence of stenosis and its relationship with the clinicopathologic factors in surveillance.

Results: Surveillance endoscopy was performed 6 months after ESD. Four of the 822 patients (0.49%) developed stenosis and required unanticipated endoscopy. The other 908 cases in 818 patients showed no symptoms or only slight abdominal discomfort (that was controlled with medication) and did not require any dilation or steroid therapies. Post-ESD stenosis was observed in 11.1% (2/18) of patients with circumferential resection between $\geq 90\%$ and $< 100\%$ and in 50% (2/4) of patients with circumferential resection of 100%. Among the 50 cases with a circumferential mucosal defect $\geq 75\%$, a circumferential mucosal defect $\geq 90\%$ was a significant risk factor ($P = .005$). Four patients with stenosis were treated successfully by endoscopic dilation.

Conclusions: Circumferential mucosal defect of more than 90% is a significant risk factor for stenosis after colorectal ESD. Surveillance endoscopy 6 months after ESD is recommended to assess for development of stenosis. Defects smaller than 90% do not require close endoscopic follow-up or prophylactic measures for prevention of post-ESD stenosis. (UMIN clinical trial registration number: UMIN000015754.) (Gastrointest Endosc 2017;86:358-69.)

INTRODUCTION

Stenosis after endoscopic submucosal dissection (ESD) for lesions of the stomach and esophagus is the main

Abbreviations: EBD, endoscopic balloon dilation; ESD, endoscopic submucosal dissection; LST-NG, laterally spreading tumor–nongranular; LST-G, laterally spreading tumor–granular; TEM, trans-anal endoscopic microsurgery.

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delayed adverse event,¹⁻⁸ excluding bleeding and perforation, and resection of more than 75% of the circumference is a significant factor related to stenosis.^{3,5} Endoscopic balloon dilation (EBD) is required multiple times

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TABLE 1. Comparison of characteristics of patients and lesions and the presence and absence of stenosis after endoscopic submucosal resection

| | Presence of stenosis | Absence of stenosis | P value* |
|---|----------------------|---------------------|----------|
| No. of patients | 4 | 818 | |
| Age (years), median (range) | 71.5 (62-80) | 67 (25-93) | .813 |
| No. of males/females | 3/1 | 487/331 | .651 |
| Concomitant disease, n | | | |
| Diabetes mellitus | 0 | 68 | 1 |
| Liver cirrhosis | 0 | 7 | 1 |
| Chronic heart failure | 0 | 18 | 1 |
| Autoimmune disease | 0 | 5 | 1 |
| Chronic renal failure | 0 | 10 | 1 |
| Medication (aspirin) | 0 | 66 | 1 |
| No. of lesions | 4 | 908 | |
| Location of mucosal defect (center), n | | | |
| Rectum | 3 | 165 | |
| Colon | 1 | 743 | |
| Morphology | | | |
| Flat | | | |
| LST-NG (IIa) | 0 | 445 | |
| LST-G (IIa, IIa + Is) | 4 | 385 | |
| Depressed (IIc, Iic + IIa, II a + IIc) | 0 | 16 | |
| Protruded (Is) | 0 | 23 | |
| Recurrence | 0 | 39 | |
| Longitudinal diameter (mm), median (range) | 95 (57-134) | 33 (8-185) | .001 |
| Circumferential diameter (mm), median (range) | 92.5 (78-187) | 40 (7-130) | <.001 |
| Circumferential extent of the mucosal defect | | | |
| <75% | 0 | 862 | |
| ≥75% to <90% | 0 | 28 | |
| ≥90% to <100% | 2 | 16 | |
| 100% | 2 | 2 | |
| Depth of invasion | | | |
| m | 3 | 747 | |
| sm1 | 0 | 95 | |
| sm2 or more | 1 | 66 | |
| Procedure time (minutes), median (range) | 295 (165-420) | 82 (5-540) | .001 |
| En bloc resection, n (%) | 3 (75) | 891 (98.1) | .768 |
| Curative resection, n (%) | 3 (75) | 798 (87.8) | .405 |
| Noncurative resection, n | | | |
| Deep invasion | 1 | 101 | .378 |
| Positive vertical margins | 0 | 11 | 1 |
| Poorly differentiated/mucinous adenocarcinoma | 0 | 10 | 1 |
| Lymphatic permeation | 0 | 29 | 1 |
| Venous permeation | 0 | 28 | 1 |
| Budding grade 2/3 | 0 | 22 | 1 |
| Adverse events, n | | | |
| Perforation | 0 | 22 | 1 |
| Muscle injury | 1 | 125 | .449 |
| Postoperative bleeding | 0 | 11 | 1 |

LST-NG, laterally spreading tumor–nongranular; LST-G, laterally spreading tumor–granular.

*The Mann-Whitney U test was used to compare continuous variables, and the Fisher exact probability test was used to compare categorical variables.

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