Easier Colorectal ESD: A Daydream or a Reality?

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Introduction

Emergence of endoscopic submucosal dissection (ESD) has made a great change for the treatment of superficial neoplasia in the GI tract. ESD has become a standard technique for gastric lesions as well as esophageal lesions in Japan and Korea. And it also become a popular practice even for colorectal lesions due to its excellent clinical results (1). However, colonic ESD is sometimes still challenging due to tortuous structure and thinner wall of the colon. Therefore, new devices and new techniques which enable ESD much easier are awaited.

Difficulties of ESD in the colon

1. Difficulties caused by poor maneuverability of endoscope

Poor maneuverability and unstable condition of endoscope is one of a major cause of difficulty of ESD in the colon. Long and strongly flexional colon or adhesion of colon due to previous surgical treatment or some abdominal disease usually disturb smooth maneuver of colonoscope. And they make it difficult even for insertion of colonoscope.

2. Difficulties caused by nature of lesions

In the colon, there are multiple factors which make it difficult to do ESD. Lesions crossing haustral fold is one of a difficult situation to do ESD due to anatomical reason. Extremely large lesions such as more than 15cm lesions are also very difficult to do ESD. And those kind of lesions often exist in cecum and rectum, therefore, ileocecal valve involvement and anal canal involvement often happen for those lesions and it becomes further difficult to do ESD. The most difficult situation to do colorectal ESD is severe fibrosis. Due to thin colonic wall it easily perforate if there is severe fibrosis under the lesion. Previous biopsy or endoscopic treatment is the most common cause of fibrosis. And previous surgical treatment is the worst situation to do ESD due to extremely severe fibrosis. Tattooing with Chinese black ink within the lesion is also troublesome since it induces some fibrosis and causes dark black color within the submucosa.
New devices and new techniques to overcome difficulties

1. Devices to provide stable condition

Double balloon endoscope (2) or single balloon over-tube is very helpful for those lesions with long and flex-ional colon or colon with adhesion. Much smoother approach and ESD is available with these devices in those difficult situations. And Lumen-R® (3) is the latest device to provide stable condition for ESD. It consisted of over-tube with small chamber and grasping forceps and provides stable working space and counter traction.

2. Injection materials and new devices to provide easier colonic procedure

Sufficient submucosal fluid cushion is always very important for making ESD much easier and safer. In addition to viscous agent such as sodium hyaluronate and methyl cellulose, injectable devices are very useful for this purpose. Hybrid knife® (4) and Enkki Jet® (5) can provide needleless injection with their very strong water pressure. Flush knife®, Splash needle® and Jet B knife® don't have such a strong power but sufficient enough to give additional submucosal fluid cushion during submucosal dissection. Dualknife® J® and Hookknife® are also new devices having injection capability that makes colorectal ESD much easier and safer.

3. Some other devices

Conical shaped transparent hood such as ST hood® and Short ST hood® are useful to get into submucosal space especially for the lesions with severe fibrosis. Thinner and shorter endoscope can provide better maneuverability, therefore, gastroscope especially multi-bending 2 channel gastroscope is very useful for rectal ESD procedure. Endolifter® and clip with string technique are available to give traction for large rectal lesions. O-ring is also available to give traction even in deeper part of colon.

4. New technique for making colorectal ESD easier

In colon and rectum, partial mucosal incision followed by partial submucosal dissection and repeating those procedures step-wisely utilizing gravity until the end of resection, is the most common way to do ESD. However, tortuous structure of the colon and presence of haustral folds sometimes make colorectal ESD difficult. Recently, pocket-creation method was developed to get much safer and stable condition even with those difficult situations (6). By creating a pocket from a small mucosal incision at the anal side, tip of the endoscope is stabilized and much smoother submucosal dissection becomes available in this method.

5. Devices for closure after large perforation or full thickness resection

Large perforation is very rare in colorectal ESD and most of small perforation can be easily managed by clipping. However, sometimes suturing is necessary in case of large perforation or full thickness resection due to severe fibrosis. Ovesco OTSC® (7) system and Overstich® (8) are the most powerful endoscopic tools to close large perforation. And slipknot clip suturing is much easier and cheaper way for suturing of large mucosal or muscle defect (9).

Conclusions
Recent advances of endoscopic devices and techniques have made colorectal ESD much easier and safer than before. However, still there is no magic tool which can change the situation drastically. Therefore, colorectal ESD should be done very carefully by well experienced endoscopist.

References