

**[ CASE REPORT ]**

# The Long-term Efficacy of Endoscopic Submucosal Dissection in the Treatment of Symptomatic Mucosal Prolapse Syndrome

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## Abstract:

Mucosal prolapse syndrome (MPS) is a benign inflammatory disease of the rectum that causes symptoms such as blood-stained stools and anemia. However, there is no treatment with a proven long-term efficacy for MPS. A 53-year-old man presented with blood-stained stools and anemia due to MPS and was treated conservatively for 1 year. However, his symptoms did not improve. We performed endoscopic submucosal dissection (ESD) for MPS. He has had no symptoms for six years after ESD, and the recurrence of MPS was not seen on endoscopy. This case shows that ESD can be effective for the long-term treatment of symptomatic MPS.

**Key words:** endoscopic submucosal dissection, mucosal prolapse syndrome, solitary rectal ulcer syndrome, long-term remission

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## Introduction

Mucosal prolapse syndrome (MPS) is a benign inflammatory disease of the rectum with ulcerated, flat, or polypoid lesions that cause symptoms such as blood-stained stools and anemia. It has been suggested that MPS is associated with abnormal defecatory habits, such as a long defecation time and straining to defecate (1).

The characteristic histopathological feature of MPS is fibromuscular obliteration of the lamina propria. This feature makes it possible to distinguish MPS from diseases with similar symptoms, such as inflammatory bowel disease and colorectal carcinomas. In 1969, Madigan (2) reported a series of solitary rectal ulcers as solitary rectal ulcer syndrome (SRUS); fibromuscular obliteration of the lamina propria was also observed in SRUS. In 1983, du Boulay (1) proposed the term MPS instead of SRUS because this histopathological feature was also found in lesions without ulceration; this is also seen in colitis cystica profunda. Therefore,

MPS is considered to have the same disease pathology as SRUS. The term SRUS is often used instead of MPS because the relationship between MPS and defecatory habits is unclear.

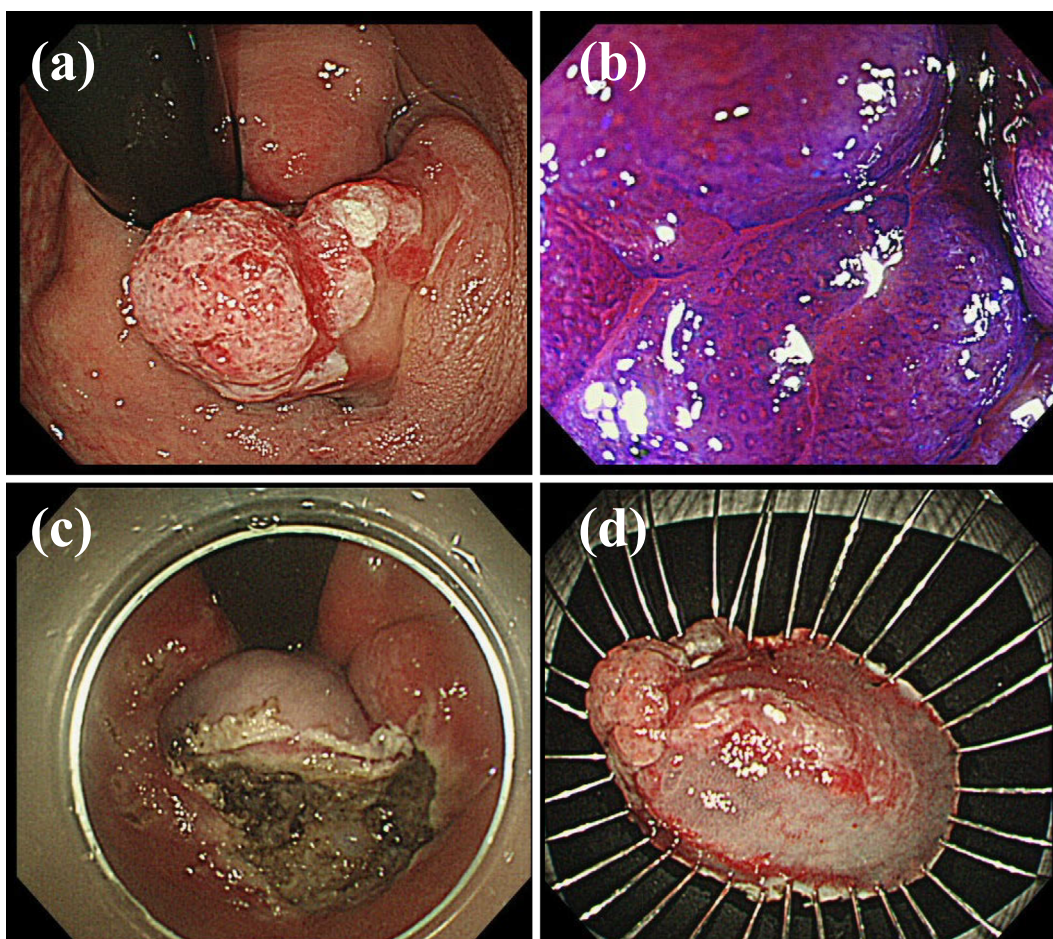
MPS with symptoms, such as blood-stained stools and anemia, is an indication for treatment. Since MPS is a benign disease, conservative treatment is given initially. Laxatives in combination with a high-fiber diet to soften the stools, a change in defecatory habits, and biofeedback are examples of the conservative treatments prescribed for MPS. The short-term effects of these treatments are good; however, the recurrence rate is high (3-7). There is no established treatment for MPS that is effective in the long term, including endoscopic treatment and surgery.

Endoscopic submucosal dissection (ESD) provides a potential therapeutic option, although the few available reports have mainly described the short-term efficacy of ESD in MPS (8-10). Therefore, there is a lack of information on the long-term efficacy of ESD in MPS, as only one report included follow-up data of three years, wherein no recurrence

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**Figure 1.** Colonoscopy findings. (a) Colonoscopy reveals MPS surrounding the hemorrhoid on the rectal dentate line. (b) Magnifying endoscopy with 0.05% crystal violet staining shows a type I pit pattern in the lesion. (c) Ulcer after ESD. (d) Specimen obtained by ESD. ESD: endoscopic submucosal dissection, MPS: mucosal prolapse syndrome

of MPS symptoms was noted (9).

We herein report a case in which ESD was successfully used to treat a case of symptomatic MPS and induce long-term remission.

### Case Report

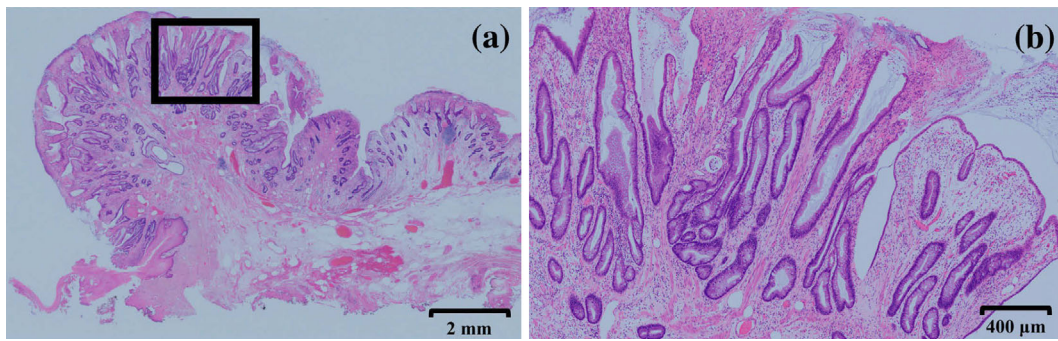
A 53-year-old man was admitted to our hospital with the chief complaint of blood-stained stools and anemia. One year earlier, the patient had been diagnosed with MPS at another hospital based on colonoscopy findings, a biopsy, and a history of abnormal defecatory habits, such as a long defecation time and straining to defecate. Subsequently, the patient was encouraged to alter his defecatory habits as a conservative treatment, but his symptoms did not improve. Therefore, he was referred to our hospital for further treatment. He presented with persistent anemia, and his hemoglobin level was 9.6 g/dL. Colonoscopy performed at our hospital revealed a 20-mm red-colored polypoid lesion on the rectal dentate line (Fig. 1a). Magnifying endoscopy with 0.05% crystal violet staining showed a type I pit pattern, which indicated a non-neoplastic lesion (Fig. 1b). We therefore diagnosed the lesion as MPS.

After obtaining the patient's consent, ESD was performed to treat his symptoms as well as evaluate the lesion. The procedure was performed with a dual knife (KD-650Q; Olympus, Tokyo, Japan) using a single-channel endoscope (GIF-Q260J; Olympus) or a two-channel endoscope (GIF-2 TQ260M; Olympus), as required, under conscious sedation. Glycerol with indigo carmine was used for the submucosal injection. Mepivacaine was used for local anesthesia because the lesion was located on the rectal dentate line. We encountered fibrotic tissue into the submucosal layer (SM) just below the lesion during the submucosal dissection phase but resected the lesions en bloc without complications (Fig. 1c, d). Bleeding during ESD was controlled with a knife or pair of hemostatic forceps (HDB2422W; Pentax, Tokyo, Japan). Visible vessels on the artificial ulcer formed after ESD were prophylactically coagulated with hemostatic forceps. The procedure lasted 55 minutes.

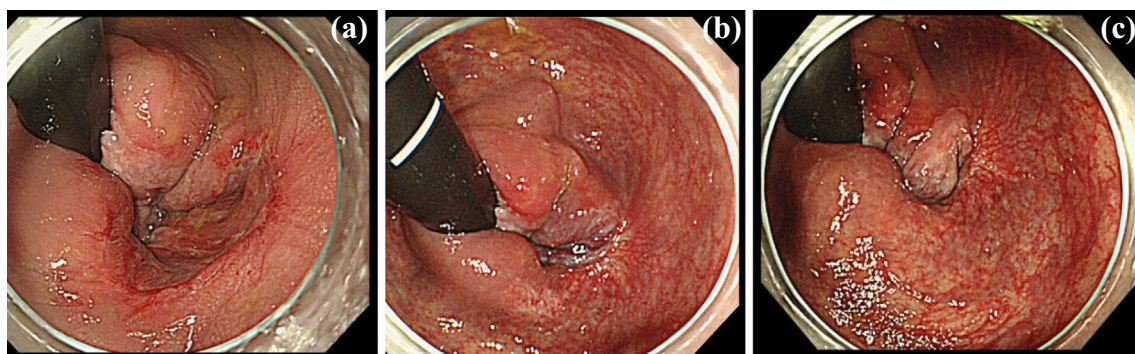
The pathological findings revealed erosion, hyperplastic and regenerative changes on the surface of the epithelium, and fibromuscular obliteration of the lamina propria (Fig. 2a, c). Finally, following the pathological examination, we diagnosed the lesion as MPS.

As there was no post-procedural bleeding or perforation,





**Figure 2.** Pathological findings with Hematoxylin and Eosin staining. (a) Pathological specimen obtained by ESD. (b) A high-power view of the pathological findings from the specimen showing erosion and hyperplastic changes on the surface of the epithelium and fibromuscular obliteration of the lamina propria. ESD: endoscopic submucosal dissection



**Figure 3.** Scar after ESD. (a) One month later. (b) Two years later. (c) Six years later. ESD: endoscopic submucosal dissection

the patient was discharged three days after the procedure. The patient's symptoms did not recur post-discharge. One month later, we found that the patient's anemia had improved with hemoglobin levels at 12.5 g/dL, and only a scar remained at the treatment site (Fig. 3a). He has been asymptomatic for six years, and annual colonoscopy has detected no recurrence of MPS since then (Fig. 3b, c).

## Discussion

Following treatment via ESD, the patient has remained asymptomatic to date (for six years) and has experienced no recurrence of MPS. This shows that ESD can improve the symptoms of MPS, such as anemia and blood-stained stools, and lead to long-term remission.

In the present case, we were able to successfully remove the MPS lesion and control the bleeding by ESD, thus improving the symptoms without any intraoperative or postoperative complications. Conservative treatment is the first-line therapy for symptomatic MPS and SRUS (11, 12). This includes laxatives with a high-fiber diet, a change in defecatory habits, and the use of biofeedback. Improvement is seen in 63.6% of patients (11). Topical therapy and surgery are considered when conservative treatment fails. Topical therapies, such as argon plasma coagulation (APC) and neodymium yttrium-aluminum-garnet laser (Nd: YAG), cause degen-

eration of the surface layer of MPS lesions directly and heal the ulcers by re-epithelialization, which leads to an improvement in the symptoms of 70-100% of the patients (13-15). Although conservative and topical treatments lead to significant improvements, the MPS lesion may persist. In contrast, since ESD removes the MPS lesion completely, a higher rate of improvement can be expected. Indeed, Tsuji et al. (9) reported that ESD was effective in two cases of symptomatic MPS. These two cases involved elderly patients who had rectal prolapse and bloody stools, but their symptoms improved after ESD. Ohta et al. (10) also reported that ESD was effective in patients with MPS accompanied by bloody stools. Although surgery also removes the MPS lesion, it is more invasive than other treatments.

ESD may also be effective for inducing long-term remission of MPS. In this case, clinically and endoscopically, the patient experienced no recurrence of the symptoms even six years after the procedure. In previous reports, no recurrence of MPS was observed on endoscopy, even three years after ESD (8). However, conservative treatments, topical treatments, and surgery all have high recurrence rates, and their long-term efficacy is unknown. Biofeedback improved MPS and SRUS in 62% (36-75%) of patients (5-7); of these, 50% experienced recurrence at a median observation period of 36 months (5). Surgery improved MPS and SRUS in 77% (54-100%) of the patients; of these, 52% (25-100%) experienced

recurrence (11). The long-term efficacy of topical therapy is unknown (13-19). Therefore, further research is required to determine whether or not ESD is indeed more effective than other treatments for supporting long-term remission.

Long-term remission of MPS after ESD may be due to the development of fibrosis. The normal mucosa is expected to replace the fibrosis and thus prevent mucosal prolapse. In the present case, fibrosis was confirmed one month after ESD. It is speculated that fibrogenesis is stimulated during ESD via the direct application of electrical heat to the deep layers of the rectal lining. The procedural field is wide and exposed to this heat for an extended period, thus eliciting a strong inflammatory response that results in severe fibrosis throughout the mucosal layers. Fibrosis after ESD in gastric cancer is seen in the SM, muscularis propria layer (MP), or deeper layers (20, 21). Similarly, in colorectal ESD, post-procedural fibrosis is usually localized to the SM but can spread to the MP or deeper layers (22). Furthermore, fibrosis after ESD is more extensive than that seen after polypectomy or endoscopic mucosal resection (22). This severe, widespread fibrosis may be responsible for maintaining long-term remission. The possibility of stenosis as a long-term complication cannot be disregarded in lesions that surround the circumference almost completely, although MPS lesions rarely surround the circumference completely.

ESD may be a good indication for polypoid lesions where APC has not been effective (12). In MPS and SRUS with ulcerated lesions, it may be difficult to perform ESD; it is therefore necessary to carefully confirm the indications before determining the mode of treatment. ESD for MPS can be performed in the same way as for rectal neoplastic lesions extending to the dentate line (23), and complications, namely pain, penetration, bleeding, and postpolypectomy electrocoagulation syndrome, may be the same for the two conditions (24). However, since MPS often develops near the rectal dentate line, pain is often experienced during ESD, so local anesthesia should be administered, as in this case. In addition, since fibrosis is often found in the SM during ESD at the rectal dentate line (23) and there is a possibility of fibrosis due to MPS, it is necessary to pay be alert for fibrosis during ESD for MPS. Furthermore, ESD may be more invasive than other topical therapies, and penetration and bleeding may occur.

ESD for MPS can be expected to provide long-term remission and may be a novel treatment for the condition. Future studies should verify the safety and efficacy of ESD for MPS.

**The authors state that they have no Conflict of Interest (COI).**

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