Introduction

Most of patients with Crohn’s disease (CD) have small intestinal lesions. One-third of those patients develop strictures within the first 10 years following initial diagnosis. Most of those patients eventually require surgical resection. Multiple surgical resection is necessary and may cause short bowel syndrome. Before, small intestine was hard to access by endoscope. Double balloon endoscopy (DBE), that was developed by Professor Yamamoto, has changed the situation. That enabled to reach all of intestine. Subsequently, single balloon endoscopy (SBE) was developed. Those balloon-assisted endoscopy (BAE) has been used not only to evaluate minute lesions of small intestine, but also to treat lesions. It is reported usefulness of endoscopic balloon dilation (EBD) for colonic stenosis of CD. Recently it has been reported that usefulness of EBD for small bowel strictures in patients with CD.

EBD for Strictures

1. Indication

Strictures are caused by inflammation and fibrosis. Anti-inflammatory medicines such as steroid or anti-TNF antibodies are effective for the former cases. However, fibrotic strictures need surgical or endoscopic dilation. Strictures with symptoms such as abdominal pain, nausea, and vomiting are indications of this procedure. Strictures with proximal side dilation are also indications. If the passage of the scope or the overtube were inhibited by stricture, those are also indications, even without symptoms. Other indications are as follows; stenoses with a length of ≤5 cm, those without fistula or abscess, those without deep ulcer; and those without severe curvature. Fistula and abscess are indications of surgical resection. Deep ulcer and sever curvature are risk factors of perforation. Recently Lémann index was proposed for assessment of intestinal damage. Magnetic resonance imaging (MRI) is used in that score. MR may be useful for distinguishing the fibrotic strictures from inflammatory ones. Not only naive case but also post-operative strictures are also indication.

2. Techniques

EBD is carried out using SBE (SIF-Q260; Olympus, Tokyo, Japan ) or DBE (EN-450 T5; FUJI FILM Medical,
Tokyo, Japan) and a through-the-scope (TTS) balloon catheter (CRE balloon catheter; Boston Scientific, Natick, MA, USA). It is preferred to use carbon dioxide for insufflation in order to avoid a large amount of air retention and better insertion. It is performed as: 1) contrast medium is injected and assess the stricture. 2) Insert the guidewire and TTS balloon catheter. 3) Inflate the balloon for 30 seconds or two minutes. 4) After dilating, scope is passed though. Adverse events are bleeding and perforation. There are multiple stenosis in some cases. They can be dilated sequentially, though careful attention needs necessary. TTS balloon is useful because the lesion is directly observed through that balloon.

**Prognosis of Balloon Dilation**

Small bowel EBD has been spread with popularization of BAE. However, there are few reports because it is a relatively new procedure. Despott et al. reported small bowel EBD performed in 9 patients. In 8 patients, stricture dilation was successful and none of the patients has required surgery during follow-up 20.5 months follow-up, though two patients required repeated dilation. Hirai et al. reported 25 cases of EBD. Short-term dilatation was succeeded in 72% of patients. Long strictures measuring more than 3 cm were less successful. Complications were encountered in 8% of cases. The cumulative surgery-free rate was 72% at one year. Recently, long-term efficacy is reported. 65 patients were analyzed. Cumulative surgery-free rate after initial EBD was 73% at 3 years. In 52 of the successful cases, the cumulative re-EBD-free rate after initial procedure was 47% at 3 years. EBD is a first-line therapy for fibrotic strictures. The choice whether repeated EBD or surgical intervention is controversial.

**Conclusions**

Endoscopic dilation is a useful procedure for strictures in CD. Though re-dilation is needed in many cases, it will avoid or at least delay resection of intestine. Further investigation is awaited to clarify indications and longer prognoses.

**References**