

Short Communication

## Dilation of Benign Colorectal Anastomotic Stricture after Low Anterior Resection with an Esophageal Bougie

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### ABSTRACT

Although circular stapling anastomosis of the rectum is widely used and is regarded as a safe and quick technique, anastomotic stricture is a frequent postoperative complication. The incidence of such strictures is as high as 30%, and dilation is the only treatment. Techniques for dilatation include use of a finger, sigmoidoscope, or balloon dilators. However, these techniques are associated with insufficient effects and must often be repeated. We report a novel dilation procedure using a guidewire in conjunction with esophageal bougies, Savary-Gilliard Bougie dilators, under fluoroscopic guidance which usually achieves sufficient dilation for more than 1 year with a single procedure.

(Jikeikai Med J 2010 ; 57 : 149-52)

Key words : anastomotic stricture, dilatation, esophageal bougies, low anterior resection

### INTRODUCTION

The double stapling technique<sup>1</sup> is a standard procedure for colorectal anastomosis. Postoperative anastomotic stricture associated with stapling is harmful and distressing for patients undergoing low anterior resection of the rectum. The incidence of such strictures is as high as 30%<sup>2-7</sup>. For this complication, dilatation has been performed with fingers, sigmoidoscopes, or balloons<sup>2-7</sup>. However, these techniques have insufficient effects and must frequently be repeated.

We report a novel technique of dilation of colorectal anastomotic stricture using an esophageal bougie which rarely necessitates repeated dilation.

### INSTRUMENTS

An Olympus CF-260AI colonoscope (Olympus Optical Co., Ltd., Tokyo, Japan) is usually used. Dilation is performed with Savary-Gilliard Bougie dilators (Wilson-Cook Medical Inc. Winston-Salem, NC, USA). First, the narrow apical part of the bougie is inserted through the strictures with a guide wire, and then the dilator part of the bougie dilates the strictures (Fig. 1).

### TECHNIQUE

A colonoscope is inserted through the anus to observe the stricture. Contrast medium (Gastrografin, Bracco Diagnostics, Princeton, NJ, USA) is administered through the accessory channel of the

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Received for publication, July 31, 2010

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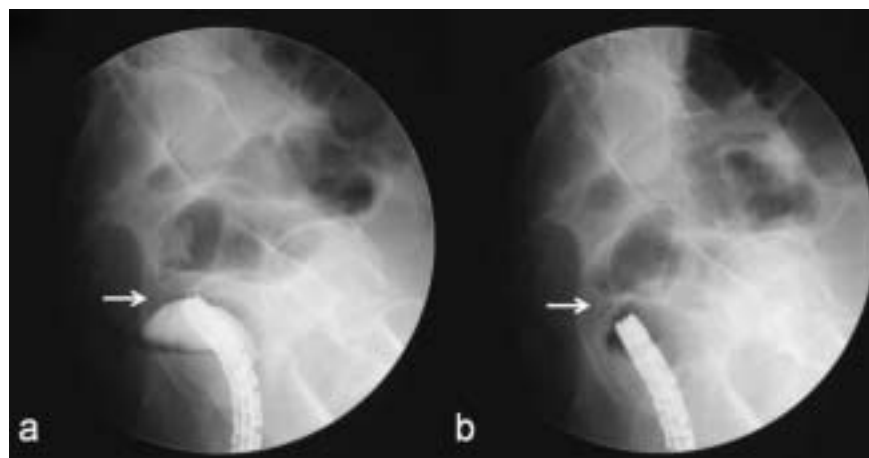
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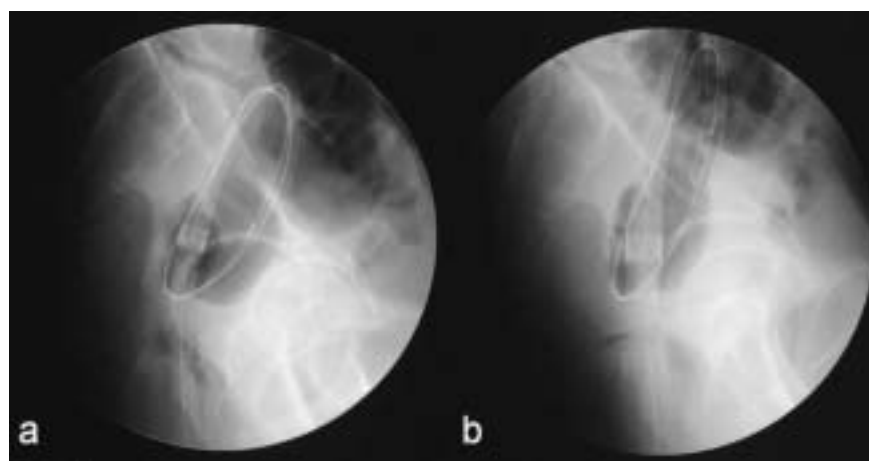


**Fig. 1.** Savary-Gilliard Bougie dilator  
The apical narrow part of the bougie can be inserted through the stricture with a guidewire, and then the dilated part of the bougie radially dilates the stricture lesion.

colonoscope to evaluate the degree of stricture and the status of the intestine from the oral side of the stricture (Fig. 2a). A 1.3-mm-diameter guidewire is passed through the accessory channel of the colonoscope and through the stricture under fluoroscopic guidance until the wire has been advanced, without force, more than 40 cm (Fig. 2b). While the wire is kept in place, the scope is withdrawn. The stricture is dilated over the guidewire, starting with an 11-mm or 15-mm dilator using markers on the wire and also



**Fig. 2.** Preparation for dilation  
a : Gastrografin is administered through the accessory channel of a colonoscope to evaluate the degree of stricture and the status of the oral side of the intestine.  
b : A 1.3-mm-diameter guidewire is passed through the accessory channel of the colonoscope and is inserted through the stricture under fluoroscopic guidance.



**Fig. 3.** Dilation with Savary-Gilliard Bougie dilators  
a : The stricture is dilated with a 15-mm dilator.  
b : The stricture is dilated with a 17-mm dilator.

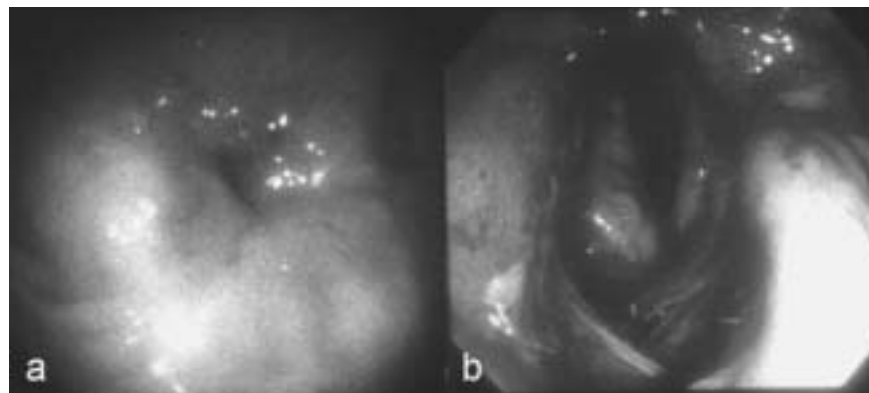


Fig. 4. Effect of dilation with a Savary-Gilliard Bougie dilator  
 a : The diameter of the stricture was less than 5 mm before dilation.  
 b : Sufficient dilation was obtained.

the dilators or under fluoroscopic guidance (Fig. 3). After the final dilation with a 17-mm dilator, the colonoscope is passed through the dilated anastomosis to reach the oral side of the intestine (Fig. 4). All procedures are performed with intravenous sedation.

### RESULTS

From January 2008 through December 2009, 5 men with anastomotic strictures after low anterior resection underwent dilation with this procedure in the Department of Surgery, The Jikei University Kashiwa Hospital. The mean patient age was 64.0 years (range, 55–73 years). The size of the staplers (DST series EEA stapler, Covidien, Mansfield, MA, USA) used for the operations was 31 mm in 3 patients and 33 mm in the other 2 patients. The diameter of the stricture was less than 5 mm in 4 patients and 7 mm in 1 patient. Sufficient dilation was achieved with only a single procedure in all 5 patients. There were no serious procedure-related complications, such as perforation, bleeding, sepsis, and death. Moreover, the strictures have no recurred in any of the 5 patients for more than 1 year after dilation.

### DISCUSSION

The development of anastomotic stricture has become a major postoperative complication after colorectal anastomosis. Reported factors that may

contribute to the formation of such stricture include blood flow, leakage, infection, inflammatory response to the anastomotic material, the size of the circular stapler, and fecal contact with the anastomosis<sup>8–12</sup>.

The treatment success rate and the recurrence rate depend on the grade of stenosis but not on the type of anastomosis (i.e., sutured vs. stapled)<sup>13</sup>. The circular staple ring of the anastomosis might accelerate the recurrence of an anastomotic stricture. The deformed and shrunken staple ring with a thickened and circumferential scar may return to predilation status if the circular staples remain intact. Thus, dilators should split the circular staple line to obtain a sufficient effect<sup>14</sup>. Various techniques have been reported for dilatation with balloons<sup>2–7</sup>, but repeated dilation is often needed for recurrent strictures<sup>15,16</sup>. Because of the high compliance of the balloons, these techniques may not be successful in destroying the circular staple line even if the stricture can be dilated to some degree.

We used a novel dilation procedure performed with a guidewire and esophageal bougies, Savary-Gilliard Bougie dilators, under fluoroscopic guidance. The esophageal bougies are made of silicone. They have extremely low compliance and are extremely rigid. Dilation occurs through the radial force that destroys the circular staple line and is confirmed with colonoscopy after dilation<sup>17</sup>. With this technique, sufficient effects may be obtained with only a single procedure.

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