EDITORIAL

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# A new band ligation device to treat colonic diverticular bleeding

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See "Comparison of conventional and new endoscopic band ligation devices for colonic diverticular bleeding" by Ayaka Takasu, Takashi Ikeya, and Yasutoshi Shiratori, on page 408–416.

The incidence of diverticular diseases is increasing worldwide. The risk factors for colonic diverticular bleeding (CDB) include older age, drug use, low physical activity levels, and obesity.[1,2] CDB accounts for approximately 26%–46% of all cases of acute lower gastrointestinal bleeding.[3,4] The risk in patients with diverticulosis is approximately 0.5 per 1,000 person-years.[5] Trauma to the diverticulum or colonic lumen is considered to cause asymmetric intimal proliferation and scarring of the vasa recta, resulting in rupture and extensive bleeding.[6]

CDB is often associated with severe bleeding and requires hospitalization. However, only approximately 25% of diverticular bleeding sites are identified.[7] It is important to locate diverticular sites exhibiting stigmata of recent hemorrhage (SRH), including active bleeding, visible non-bleeding vessels, adherent clots, and bleeding caused by clot removal. Without endoscopic treatment, the likelihood of SRH rebleeding is very high[7]; therefore, patients should be treated with this treatment modaility.[8,9] Endoscopic hemostasis for CDB involves epinephrine injection, contact thermal hemostasis, or mechanical hemostasis (clipping and ligation).[8,9] Epinephrine can reduce the bleeding rate or induce temporary hemostasis via tamponade effect and vasoconstriction, but it is associated with a high risk of rebleeding if used alone. Contact thermal hemostasis (e.g., monopolar coagulation) is not recommended because of the risk of perforation in the absence of the muscularis propria. Therefore, mechanical hemostasis methods, including endoscopic clipping and endoscopic band ligation (EBL), are favored.[8,9] Clipping is particularly popular because tissue damage is minimal and treatment can be performed without withdrawing the colonoscope. The endoscopic clipping method for CDB can be classified into direct and indirect placement methods. The direct placement method is defined as the application of clipping directly to a bleeding point identified in the diverticulum, while the indirect placement method is defined as the closure of a diverticular opening in a zipper-like manner, which is performed when there is difficulty in accessing the blood vessels in the diverticulum.[9] The immediate bleeding control rate is approximately 95% for both methods, but the early and delayed rebleeding rates are significantly higher after indirect placement than after direct placement.[10] The EBL technique for CDB is identical to the esophageal variceal ligation (EVL) technique, wherein the target diverticulum is suctioned into a band ligator hood and an elastic band is then released for ligation. The main advantage of this method is the lower rate of conversion to arterial embolization or surgery than that after endoscopic clipping or coagulation. The EBL technique for CDB is more effective than

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other modalities, especially in resolving diverticula.[11] However, its disadvantages include colonoscope reinsertion after withdrawal since the mounted opaque hood limits the endoscopic field of vision and the risk of perforation. Although the Japan Gastroenterological Association guidelines state that the EBL method can be used to treat CDB,[8] EVL devices have only been used to date. However, a new EBL (N-EBL) device has been developed for the treatment of CDB and internal hemorrhoids by Sumitomo Bakelite Co. Ltd. (Tokyo, Japan), which invented the EVL device. The main difference between the conventional EBL (C-EBL) and N-EBL devices is that the former can be mounted on a gastroscope (9.8 mm in diameter), whereas the latter is mounted on a colonoscope.

In an issue of *Clinical Endoscopy*, Takasu et al.[12] introduced the C-EBL device and compared the clinical outcomes of patients with CDB treated using C-EBL and N-EBL devices. Although there was no significant difference in initial hemostasis and early (within 30 days) rebleeding rates between the groups, the early rebleeding rate in the N-EBL group was more than two times higher than that in the C-EBL group (17.5% vs. 8.3%, $p$=0.241). Most N-EBL rebleeding cases occurred in the right colon of patients taking two antithrombotic agents, which are known risk factors for rebleeding. Large-scale studies are recommended to verify the effectiveness of N-EBL. The complete diverticular inversion rate was approximately 80% in both groups. Based on evidence, no rebleeding is expected if there is complete inversion after ligation of the diverticula. However, rebleeding occurred in five cases; hence, careful monitoring is recommended even when the diverticula are completely inverted.

The N-EBL procedure time was significantly shorter than that of C-EBL, probably because the N-EBL hood was larger and more transparent, thus providing a wider field of endoscopic vision. In addition, the colonoscope suction channel was larger than that of the gastroscope; thus, foreign substances and blood in the colonic lumen were more rapidly aspirated during N-EBL than during C-EBL. No perforation was noted in any of the patients. Therefore, N-EBL was as effective and safe as C-EBL for the treatment of CDB, but it was faster. The limitations of this study include the relatively small number of cases and retrospective design. Therefore, large-scale, prospective studies are recommended.

## Conflicts of Interest

The author has no potential conflict of interest.

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