VIDEO CASE REPORT

Endoscopic closure of the defect after endoscopic submucosal resection with metal clips and surgical sutures



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Successful closure of large mucosal defects is vital for submucosal tumors originating from the muscularis propria layer after endoscopic submucosal resection. However, it is difficult to close large defects using only metal clips with use of a single-channel endoscope. Although endoscopic pursestring suturing has been identified as an effective method for large defects, it requires a double-channel endoscope, which increases the technical difficulty.¹ In addition, some new traction methods have been reported to help close large defects, but they require special devices and extra help.^{2,3} How to close large defects effectively and easily with a single-channel endoscope is still an issue worth studying. We report a new closure method with metal clips and surgical sutures (Fig. 1).

A patient received a diagnosis of a submucosal tumor, approximately 20 mm in size, located at the anterior wall of the gastric body. EUS showed that the lesion originated from the muscularis propria layer. The patient accepted endoscopic submucosal resection for fear of GI stromal tumor. In consideration of muscular injury, the defect was ready to be closed completely. First, a surgical suture (USP 3-0; Surgilon, Covidien) was tied up to 1 tooth of the first metal clip. Then, a syringe cap was used to develop a small loop. The diameter of the loop should be no more than the width of an open metal clip (Video 1, available online at www. VideoGIE.org). Next, the first clip was fixed on the mouth side of the defect (Fig. 2A). One tooth of the second clip was then inserted into the loop of the first clip and moved close to the anal side of the defect (Fig. 2B). The defect decreased significantly when the second clip was fixed on the anal side (Fig. 2C). The residual incision was easily and completely closed with another 6 clips (Fig. 2D). The patient recovered well and no adverse events occurred after the procedure. Histopathologic examination showed that the lesion was a leiomyoma (Fig. 3). Recently, some simple closure techniques such as the endoscopic string clip suturing method^{1,2} and line-assisted complete closure³ have been reported. The similarity is that the first 2 clips could be gathered by pulling the free end of the string through the endoscopic channel. However, we consider



Figure 1. Endoscopic closure schema with metal clips and surgical sutures. **A**, A surgical suture was tied to 1 tooth of the first clip, and a small loop was made. The diameter of the loop should be no more than the width of an open clip. **B** and **C**, The first clip was fixed on 1 side of the defect. **D**, One tooth of the second clip was inserted into the loop of the first clip and moved close to the contralateral side. **E**, The second clip was fixed on the contralateral side of the defect. **F**, The residual incision was completely closed with more clips.



Figure 2. Endoscopic closure of the gastric wall defect with metal clips and surgical sutures. **A**, The first clip was fixed on the mouth side of the defect. **B**, One tooth of the second clip was inserted into the loop of the first clip. **C**, The second clip was fixed on the anal side of the defect. **D**, The defect was completely closed with more clips.



Figure 3. Histopathologic view indicating that the lesion was a leiomyoma.

our method to be simpler and more effective because it needs no extra help when performing the procedure.

DISCLOSURE

All authors disclosed no financial relationships relevant to this publication.

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https://doi.org/10.1016/j.vgie.2018.09.007