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Usefulness of the maXium high-frequency surgical device in colorectal EMR

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Purpose

High-frequency surgical devices with various functionalities are widely used in Europe and Japan [1]. In this study, we evaluated the effectiveness of the maXium HF surgical device manufactured by KLS Martin (Germany) during endoscopic mucosal resection (EMR).

Materials and Methods

The maXium device offers multiple preconfigured modes for incision and coagulation tailored to different surgical procedures. Endoscopists can intuitively select the appropriate mode using icons on the front panel. For polypectomy and EMR, the device uses the Polyp I/II mode, which alternates between incision and coagulation waves. This mode is characterized by a relatively short incision wave duration, even at

increased power settings. During polypectomy and EMR, incomplete coagulation of vessel margins may occur if a vessel is resected in a single pass with excessive clamping, potentially leading to post-procedural bleeding. We examined the number of incision wave applications and hemostatic interventions performed prior to resection in 110 colorectal lesions from 35 patients who underwent polypectomy or EMR at our institution between August and December 2018 using the maXium device. Hemostasis was achieved using radiofrequency coagulation via hemostatic forceps and snare tips.

Results

The 110 resected lesions were classified as follows: 8 lesions were type Ip, 23 were type lsp, 59 were type ls, and 20 were type Ila. Lesion sizes were categorized as 0–5 mm (24 lesions; mean energizations: 2.1; hemostatic interventions: 2/24, 8%), 5–10 mm (72 lesions; mean energizations: 2.6; hemostatic interventions: 4/72, 5%), 10–15 mm (11 lesions; mean energizations: 2.8; hemostatic interventions: 2/11, 18%), and 15–20 mm (2 lesions). Resection was achieved in a single incision wave in 8 cases (7.8%). No cases of delayed hemorrhage or perforation were observed. The number of lesions resected with a single current application during EMR was relatively low.

Conclusion

Due to its low incidence of intraoperative bleeding, the maXium device demonstrates significant utility for EMR, a procedure commonly performed in routine clinical practice.

Conflicts of Interest: None.

Funding information: None.

Data availability: None.

- References

[1] Rey JF, Beilenhoff U, Neumann CS, Dumonceau JM; European Society of Gastrointestinal Endoscopy (ESGE). European Society of Gastrointestinal Endoscopy (ESGE) guideline: the use of electrosurgical units. *Endoscopy*. 2010 Sep;42(9):764-72.

Table 1: The table summarizes the classification and characteristics of 110 resected lesions.

Lesion Type	Size Category	Number of Lesions (by Size)	Mean Energizations	Hemostatic Interventions (Cases /%)
Type Ip	8	0-5mm	2.1	2/24 (8%)
Type Isp	23	5-10mm	2.6	4/72 (5%)
Type Is	59	10-15mm	2.8	2/11 (18%)
Type Ila	20	15-20mm		

Single Incision Wave Resection (Cases/%)	8 (7.8%)
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