

ADVANCES IN ENDOSCOPY

Current Developments in Diagnostic and Therapeutic Endoscopy

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Endoscopic Mucosal Resection Vs Endoscopic Submucosal Dissection for Colon Polyps



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G&H What endoscopic techniques are currently available for the removal of colon polyps?

PD Currently, the main endoscopic techniques that are available for the removal of colon polyps are polypectomy, endoscopic mucosal resection (EMR), and endoscopic submucosal dissection (ESD).

G&H How is EMR performed, and when should it be used?

PD EMR is performed with a snare to capture the target tissue. An electrosurgical current is then used to transect the tissue that has been grasped, although recently a cold snare EMR has been described. Injection is usually given in the submucosal space to elevate the lesion but is not always necessary; some techniques, such as underwater EMR, do not require injection into the submucosa. If the lesion is larger than 15 to 20 mm, it typically has to be removed in piecemeal fashion. The main use of EMR is to remove dysplastic polyps that are larger than 10 mm.

G&H How is ESD performed, and when should it be used?

PD ESD is performed by injecting fluid into the submucosa and creating an incision around the

perimeter of the lesion, and then carefully dissecting the lesion from the deeper layers. Various specialized instruments (ESD knives) are utilized to perform the procedure. The use of ESD continues to evolve as the technique improves. In Japan and Europe, there are guidelines that provide specific recommendations on the appropriate use of ESD. Although there are subtle differences between the 2 guidelines, generally speaking, ESD is endorsed for lesions that have a high likelihood of cancer invading the superficial submucosa and for lesions that cannot be removed by EMR due to fibrosis in the submucosal space or post-EMR recurrences. At present, there are no US-specific guidelines for the use of ESD.

G&H What are the advantages and disadvantages associated with each technique?

PD Each technique has its own advantages and disadvantages. EMR is relatively simple to perform, uses a limited number of devices, and has a long track record of being successful for the majority of dysplastic, precancerous lesions. The main disadvantage of EMR is that piecemeal resection is required for larger lesions, which precludes, in some cases, accurate histopathologic evaluation and may compromise a cure. As a result, some patients who are treated with EMR may require additional surgery, whereas if they had been treated with ESD, they may have been cured. The other major

disadvantage of EMR is that it has a high lesion recurrence rate in the range of 15% to 20%, which necessitates further therapy.

The main advantage of ESD is that it allows en bloc resection of any type of lesion regardless of size. Removing the entire lesion in a single piece is a basic oncologic principle and carries the benefits of accurate histologic assessment and staging, determination of

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curative resection, and a very low recurrence rate of less than 1%. However, ESD is technically more demanding than EMR and requires advanced endoscopy skills. Furthermore, ESD is a longer procedure associated with a higher perforation rate compared to EMR. Fortunately, the vast majority of perforations caused by ESD can be successfully treated by endoscopy without the need for surgery.

G&H What adverse events are associated with these techniques?

PD The adverse events for both EMR and ESD are similar, although they occur at a different proportion. The rate of perforation is approximately 0.5% to 1% for EMR and approximately 5% for ESD. Delayed bleeding can occur, and the rate is roughly the same for both procedures.

G&H Have any studies evaluated the short- and long-term cost-effectiveness of the 2 techniques?

PD Studies have evaluated the cost-effectiveness of EMR and ESD compared with surgery, and those findings have shown a significant cost savings with the endoscopic approaches.

G&H What training is necessary to perform EMR and ESD?

PD Both procedures are advanced endoscopic techniques, and dedicated training is needed. Although

EMR is frequently labeled as easier to perform, it is still a quite complex procedure. Studies have shown that more than 100 EMR procedures are required before the flatter portion of the learning curve is reached. The learning curve for ESD is even steeper, as the procedure requires dedicated time and effort. Training in ESD is particularly challenging in the United States, where mentorship may not necessarily be easily available. Therefore, in the United States, endoscopists who want to be trained in ESD follow an evolving pathway to competency. This pathway typically involves participation in hands-on workshops such as those organized by the American Society for Gastrointestinal Endoscopy, self-study on animal models, and observation of experts—which currently requires visits to a high-volume center in Southeast Asia. After these initial steps, trained endoscopists should perform ESD in easier cases first, such as lesions located in the distal stomach and rectum.

G&H Why is ESD the preferred modality in Asian countries, whereas EMR is preferred in Western countries?

PD ESD was developed in Japan because that country has the highest prevalence of gastric cancer in the world. Japanese endoscopists were removing early gastric cancer via EMR and the results were unsatisfactory, mostly due to low cure and high recurrence rates. Therefore, they started exploring minimally invasive endoscopic alternatives to EMR. ESD has revolutionized the management of early gastric cancer and now is the preferred modality around the world. Following the success in the stomach, the use of ESD has expanded to the esophagus and the colorectum, and in Japan this procedure is routinely performed in these areas. There has been reluctance to adopt ESD in the West because of the lower prevalence of gastric cancer; however, endoscopists have come to the realization that ESD can be a very useful technique throughout the gastrointestinal tract. Over the last few years, there has been great enthusiasm to adopt ESD in the United States, which has led to increased training opportunities, new device availability, and recognition by the practicing gastroenterologist of the value of ESD.

At this point, endoscopic resection techniques are the preferred modality for management of dysplastic and early cancer lesions throughout the gastrointestinal tract. Both ESD and EMR contribute to the successful management of these lesions, and each patient needs to be treated with the most appropriate technique in his or her case. Therefore, both techniques should be adopted and available to our patients.

G&H What are the priorities of research in this field?

PD One of the main priorities is to demonstrate the efficacy and safety of ESD in the Western population. Furthermore, more and newer devices are becoming available, and it would be beneficial to document the outcomes with these improved devices. Finally, the cost-effectiveness of ESD compared with surgery or with EMR needs to be examined.

Dr Draganov serves as a consultant for Olympus, Cook Medical, and Boston Scientific.

Suggested Reading

Backes Y, Moons LM, van Bergeijk JD, et al. Endoscopic mucosal resection (EMR) versus endoscopic submucosal dissection (ESD) for resection of large distal non-pedunculated colorectal adenomas (MATILDA-trial): rationale and design of a multicenter randomized clinical trial. *BMC Gastroenterol.* 2016;16(1):56.

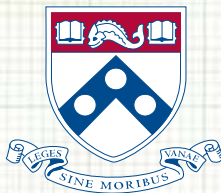
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