

ADVANCES IN ENDOSCOPY

Current Developments in Diagnostic and Therapeutic Endoscopy

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Advances in Endoscopic Resection in the Lower Gastrointestinal Tract



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G&H What are the goals of endoscopic resection of neoplastic lesions in the colon?

MB The goals of endoscopic resection of neoplastic lesions are pretty much the same throughout the digestive tract. They are also the same irrespective of the lesions' size or underlying pathology. Our work at Westmead Hospital, University of Sydney, is focused on endoscopic tissue resection for dysplastic lesions and early cancer at all sites in the gastrointestinal (GI) tract, including Barrett esophagus, early gastric cancers, ampullary and duodenal lesions and particularly large nonpedunculated colorectal polyps (LNPCP). The goals are the same for all: to resect the target lesion precisely, safely, effectively, efficiently, and completely with the purpose of cure. Accomplishing this requires a technique that will deliver the desired outcome but minimize invasiveness and unnecessary expenditure of time or cost. Because of the high demand for endoscopic procedures and the burgeoning health budget, time and cost efficiencies are important.

G&H When and why should either endoscopic mucosal resection or endoscopic submucosal dissection be used to resect large colonic lesions?

MB The mainstay of endoscopic resection for advanced lesions in the colon is endoscopic mucosal resection (EMR). This is because most lesions are benign. Lesions

larger than 20 millimeters cannot be excised in a single piece using EMR, but, if the lesion is benign, it can be removed in pieces.

If early invasive cancer is suspected, whether it be overt or suspected covert disease, en bloc resection

It is now known that careful evaluation of the resection field—the mucosal defect where the lesion was removed—will enable stratification of the risk of post-EMR complications, particularly perforation.

technique—namely endoscopic submucosal dissection (ESD)—is required to remove the lesion in one large piece with clear margins.

The risk of cancer in rectal LNPCP is about three-fold higher than that of the colon. Our data suggest that the risk of early invasive cancer is about 12% to 15% and that of the colon is about 5%. If the morphology

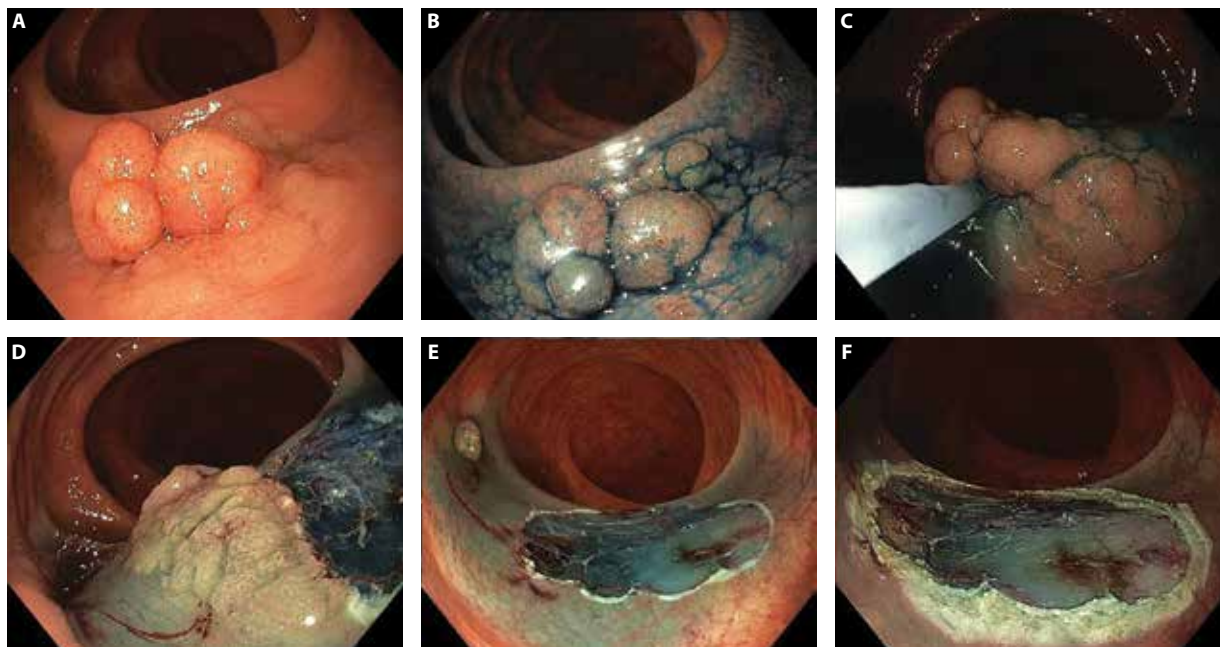


Figure. (A-F) A 40-mm Paris 0-IIa + Is, granular, Kudo IV, LNPCP in proximal rectum treated by piecemeal EMR. (E) Post-EMR defect. (F) Thermal ablation of the post-EMR defect margin with STSC.

EMR, endoscopic mucosal resection; LNPCP, large nonpedunculated colorectal polyp; STSC, snare tip soft coagulation.

suggests that there is a risk of either covert or overt invasive cancer of the rectum, an endoscopic resection technique that delivers en bloc excision—ESD—is the preferred procedure. The risks of rectal surgery, both short- and long-term morbidity and mortality, are much greater than they are for surgery of the colon. Therefore, a more aggressive endoscopic resection approach is recommended for rectal lesions.

Once the tumor is removed, complete T staging can be achieved. Further treatment can then be stratified based on the histology of the lesion. Endoscopic resection does not preclude additional therapy be it surgery or radiotherapy. Endoscopic resection serves as a definitive T staging modality.

G&H What are the prerequisites to optimize outcomes?

MB An experienced team of nurses and colleagues who are familiar with the various advanced resection modalities is essential. Ideally, 2 or 3 gastroenterologists in a group of 10 or 20 gastroenterologists working in a practice—whether it is teaching-hospital-based or a private facility—should have subspecialization in advanced endoscopic tissue resection in the colon, and maybe another 2 or the same practitioners have specializations in tissue resection in the upper GI tract. These practitioners would

handle all the referrals from the other practitioners and build up their experience. With experience, of course, outcomes are improved. Continuous audits of technical outcomes, adverse events and recurrence rates are essential. Video recording of procedures and case discussion will allow endoscopists to review their techniques and outcomes to further improve quality.

G&H What new developments do clinicians need to be aware of regarding endoscopic resection of the lower GI tract?

MB Techniques that eliminate the risk of recurrence, perforation and bleeding have been developed. They have been carefully examined in prospective observational and randomized trials. A highly refined EMR technique that delivers excellent outcomes is now a reality.

Recognition, understanding and thorough evaluation of the post-EMR defect is critical. It is now known that careful evaluation of the resection field—the mucosal defect where the lesion was removed—will enable stratification of the risk of post-EMR complications, particularly perforation. Our team developed the Sydney deep mural injury (DMI) classification. The use of this tool has reduced the risk of delayed perforation from about 2% or 2.5% to almost zero. If evidence for DMI type 2, 3 or 4 is discerned, then clips are applied to

the site, which eventually eliminates the risk of delayed perforation.

Post-EMR bleeding occurs in 5% to 7% of cases overall. It mostly originates in the right colon, where the risk is between 10% and 12%. Two randomized, controlled trials have shown that clipping in the right colon

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dramatically reduces the risk of post-EMR bleeding from around 9% to 3%. Results of a recently completed randomized trial conducted by our team are almost identical.

The critical advance in terms of efficacy has been the development of thermal ablation of the margin of the post-EMR defect to reduce recurrence (Figure). Our team at Westmead Hospital, University of Sydney, performed a randomized trial, published in *Gastroenterology* in 2018, that included 420 patients. It showed that the risk of post-EMR bleeding could be reduced from about 20% to 5% by destroying the margin of the defect with thermal ablation using snare tip soft coagulation (STSC). Since then, a large international, multicenter, open-label study was conducted by our team. About 1500 patients were enrolled, with outcomes reported in nearly 1000 patients at 6 months follow-up. The risk of recurrence was reduced to 1% to 2%, suggesting that thermal ablation of the margin of the post-EMR defect is extremely effective. It has totally transformed the field in terms of preventing recurrence.

G&H What do clinicians need to know about appropriate post-EMR protocols/follow-up measures?

MB Once a lesion is completely removed and all visible adenoma has been resected and the post-EMR defect margin has been ablated, the patient is scheduled for follow-up. The convention has been to do the follow-up at 6 months after the procedure, but this can probably now

be lengthened to 12 months. As mentioned, the risk of recurrence is about 1% to 2%.

The endoscopist needs to be familiar with the differing morphologies of the scar at 6 months. A few things will be observed. If clips were used, nodular tissue adjacent to a clip or from a clip that has since migrated may be seen. The tissue will have a normal pit pattern and will not look dysplastic. If there is concern of a recurrence, the tissue can be excised and ablated using cold-snare excision with STSC.

It is important to remember that adenoma looks like adenoma with the characteristic pit pattern under narrow-band imaging. It is usually at the edge of the scar and very flat. Recurrence, which was much more common in the past, is now rare. However, if recurrent adenoma is suspected, it should be excised. STSC should be used at the margin of the excision, and the excision should be aggressive. Specimens should be retrieved for histology, and the defect site should be clipped to help prevent delayed complications.

If a bland scar is observed, a routine biopsy is done for research, although research has shown that biopsy in this circumstance is not necessary. Scar evaluation should proceed with high-quality, high-definition white light and then narrow-band imaging to confirm that no residual adenoma is present. The patient can be scheduled for the next surveillance at 18 months, and then usual surveillance protocols are followed at 3 years and so on.

Oftentimes these patients have other polyps, and these lesions may be overlooked at the time of the index resection. At the first surveillance, the clinician needs to make sure that the remainder of the colon has been carefully evaluated and that other lesions have not been missed. Twenty percent of patients will have another advanced lesion, either a lesion with high-grade dysplasia or a lesion that is 20 millimeters or larger.

Another important advance is the concept of “covert” invasive disease dependent on lesion morphology in the distal colon and especially rectum. LNCP with large nodules and without overt surface features of cancer have a risk of covert cancer of approximately 10% to 15% and are therefore best removed en bloc by ESD.

G&H What innovations do you anticipate in the near future?

MB This is an exciting time in the field of endoscopic resection in general and particularly in endoscopic resection in the colon. As mentioned, the general goal of endoscopic resection is to treat the target lesion safely, completely, and carefully, but therapy should be

tailored to the pathology. This is something that has been missing in medicine. As endoscopic resection improves, the traditional surgical approach to managing advanced mucosal neoplasia and early cancer will become less important. Many lesions that were once ineligible for endoscopic management can now be effectively managed endoscopically. Even if the endoscopic pathology dictates that more aggressive therapy is required, all therapeutic options are still feasible.

The future may see the expansion of the role of cold-snare excision in the management of subgroups of large polyps. Our team at Westmead Hospital, University of Sydney, is currently midway into a randomized trial of cold-snare excision for flat LNPCP. Cold-snare excision eliminates the risk of post-EMR bleeding. The tradeoff is a higher risk of recurrence, but because the patient will present for a 6-month follow-up, recurrence can be efficiently dealt with at that time.

Artificial intelligence will also have an expanding role. Clinicians will be able to more confidently detect and predict the presence of invasive disease and the stage of that invasive disease, whether it is superficial submucosal or deeper submucosal. This advance will help in

the selection of resection strategies in terms of EMR versus ESD versus surgery for deep invasive disease.

Disclosures

Dr Bourke declares that he has received research support from Olympus, Boston Scientific and Cook Medical.

Suggested Reading

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