

ADVANCES IN ENDOSCOPY

Current Developments in Diagnostic and Therapeutic Endoscopy

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Risks and Potential Cost Savings of Not Sending Diminutive Polyps for Histologic Examination



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G&H How have diminutive polyps traditionally been managed?

DKR Management of diminutive polyps (≤ 5 mm in size) depends on the part of the colon in which they are found. In general, the rule has been to remove all diminutive polyps encountered during colonoscopy and send them for histologic evaluation except when there are numerous diminutive polyps in the rectosigmoid that are obviously hyperplastic, in which case it is fine to simply biopsy a few of them. Even with standard white-light colonoscopy, endoscopists can usually tell whether diminutive rectosigmoid polyps are probably hyperplastic (eg, if they are pale, flat, or sessile, particularly if they disappear with air insufflation).

G&H Why is there a debate over whether all diminutive polyps seen during colonoscopy should be sent for histologic examination?

DKR The majority of colonic polyps are less than 1 cm in size; in fact, most are 5 mm or smaller. Diminutive polyps are very rarely malignant, and it is very uncommon for them to have high-grade dysplasia or villous elements. Approximately half of diminutive polyps are adenomas, and the overwhelming majority of these are tubular adenomas with low-grade dysplasia. The remainder of diminutive polyps are serrated, and they are almost all hyperplastic, particularly in the distal colon. Although endoscopists encounter large numbers of these polyps and remove them, it is questionable how much this helps patients.

The information obtained from the histologic evaluation of nonmalignant polyps is mainly used in clinical practice to decide when the next colonoscopy should be performed, as the current recommendations for assigning subsequent colonoscopy intervals rely heavily on whether the histology is hyperplastic or adenomatous. However, pathology fees for the evaluation of colonic polyps constitute a substantial portion of the burden of total gastrointestinal pathology costs, and even pathology fees in general, across the United States and in many countries around the world where colonoscopy is a commonly performed procedure. It is not clear whether the pathology costs for diminutive polyps, which have such a small likelihood of cancer, are a wise use of money. It seems reasonable to look for alternative means of determining whether a polyp is adenomatous or hyperplastic and, thereby, when the follow-up colonoscopy should be performed. In fact, several endoscopic imaging technologies have already been shown to allow effective real-time differentiation of adenomas from hyperplastic polyps. My colleagues and I recently performed an analysis of the cost savings and risks of utilizing these methods as a substitute for submitting resected diminutive polyps for histologic assessment.

G&H Could you describe the principal findings and conclusions of your study?

DKR We performed a decision analysis to model the effects of 2 strategies for diminutive polyp management. The 2 strategies were submission of all diminutive polyps for histologic examination and the resect-and-discard

strategy, in which diminutive polyps are removed after endoscopic estimation of histology and discarded without pathologic examination. In the latter strategy, surveillance intervals were assigned based on the endoscopic estimation of histology for all diminutive polyps, while polyps larger than 5 mm were still sent to pathology. We used a database of 10,060 consecutive colonoscopies to determine the prevalence of polyps of various sizes and histologies.

The model predicted that fewer than 1 in 1,100 patients would have a cancer in a diminutive polyp that would not be detected using a resect-and-discard practice. Histologic assessment of all polyps resulted in incorrect assignment of surveillance intervals in 1.9% of patients versus 11.8% with the resect-and-discard strategy. Among patients with diminutive polyps, the average cost savings per patient was \$210 using Medicare reimbursement. Assuming that 44% of the estimated 14.2 million colonoscopies performed per year in the United States result in removal of a diminutive polyp, the potential upfront savings from using the resect-and-discard strategy would be over \$1 billion per year.

The adverse consequences of the resect-and-discard strategy include the risk of cancer associated with an inappropriately long colonoscopy interval. These consequences are partly offset by a lower risk of perforation and bleeding when longer intervals are used. The net cost of consequences was estimated at \$36 per patient, resulting in a net cost savings of \$174 per patient. Dividing the additional cost of submitting all diminutive polyps to pathology by the expected benefits resulted in an incremental cost-effectiveness ratio of \$377,460 per life-year gained. Thus, submitting all diminutive polyps to pathology was not found to be a cost-effective practice in this analysis.

G&H Based on your study findings, what is your recommendation for handling diminutive polyps seen in colonoscopy?

DKR Right now, the recommendation has not changed from the usual practice, which, as stated above, is to remove diminutive polyps and send them for histologic evaluation (except when there are multiple, rectosigmoid, hyperplastic polyps). The resect-and-discard strategy is something that we are trying to work toward. Before we can adopt a resect-and-discard policy in clinical practice, several steps would have to be completed.

First, in addition to experts being able to perform real-time histologic analysis accurately, we need to demonstrate that physicians in community practices can perform this analysis adequately as well. Second, our professional societies—particularly the American Society for Gastrointestinal Endoscopy (ASGE), which will likely lead change in this area—need to take the position that the resect-and-discard

policy is an acceptable new standard of care for diminutive polyps. Having the ASGE take this position would provide the necessary support, from a medicolegal standpoint, to allow practicing colonoscopists to take this step. The ASGE recently published a paper in *Gastrointestinal Endoscopy* as part of their series on the preservation and incorporation of valuable endoscopic innovations (PIVI), which outlined the types of performance characteristics that any given technology needs to meet in order for the ASGE to determine whether that technology could be used as a substitute for pathologic assessment of diminutive polyps.

Finally, it would be good if the new policy was endorsed by the staffs and tissue committees of various hospitals, as some institutions have a policy that all human tissue removed during a procedure must be sent for pathologic assessment.

Thus, along with any well-established paradigm of medical practice, such as the policy that all resected tissue must be submitted for histologic examination, there are a variety of rules and regulations in place to support the paradigm. In my opinion, we should continue our current practices until we complete these steps and get these rules changed. Once we accomplish this goal, we will be in a position to make colonoscopy a more cost-effective tool.

G&H Are there nonhistologic means of distinguishing hyperplastic polyps from adenomatous polyps that would be more cost-effective?

DKR Several endoscopic imaging techniques have been found to be quite effective. There are very sophisticated methods, such as confocal laser microscopy, which can provide virtual histologic sections and appear to be very accurate; Pentax offers a scope-based system, while Mauna Kea offers a probe-based system. There is an endocytoscopy system (Olympus), which is a supermagnification system that is probably also very accurate, although it has less supportive data than confocal laser microscopy at this time. Confocal laser microscopy and the endocytoscopy system each require a capital investment in special equipment, and we did not model the cost-effectiveness of these systems in our study. However, all of the current commercial colonoscopes include push-button technologies that have been shown to allow effective real-time histologic assessment, and they are included as standard equipment. These push-button technologies include narrow-band imaging (Olympus), the Fujinon intelligent chromoendoscopy system (Fujinon), and iScan (Pentax; Figures 1 and 2). These systems are fairly user-friendly and accurate, although narrow-band imaging has the most supporting data. As noted earlier, we need to demonstrate that community physicians can use these technologies with accuracy.



Figure 1. A 2-mm flat adenoma in narrow-band imaging. The brown structures are vessels. The white structures are oval, tubular, and variable in shape.

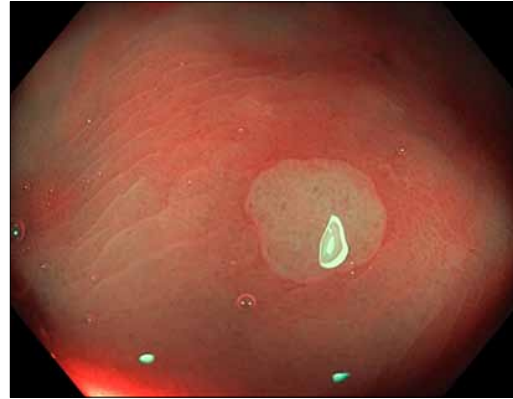


Figure 2. A 2-mm hyperplastic polyp in electronic magnification and narrow-band imaging. The color is lighter than the surrounding mucosa. There are no visible blood vessels, and the surface shows a pattern of gray-black dots.

G&H Besides the resect-and-discard policy, are there other uses for real-time assessment of histology?

DKR There are 2 ways that real-time histology can be used. One is to resect and discard, which means to remove diminutive polyps and throw them away, as mentioned above. The other is to leave diminutive hyperplastic polyps in the rectosigmoid in place. The ASGE PIVI document addresses both of these potential uses.

G&H How much error will be introduced into postpolypectomy surveillance by the adoption of a resect-and-discard policy?

DKR A variety of factors currently have a negative impact on the effectiveness of postpolypectomy surveillance. Most important is the fact that many polyps, even large polyps, are missed during colonoscopy. Second is the fact that many colonoscopists do not follow the recommended guidelines because they do not know or agree with them, because they yield to financial incentives not to follow them, or because of other reasons that we may not understand. These factors likely have a much greater impact on the effectiveness of surveillance colonoscopy than any error introduced by performing real-time histology. It has already been demonstrated that experts can identify the appropriate time interval for surveillance in over 90% of cases using real-time histology. Therefore, the negative impact of the resect-and-discard policy on selection of surveillance intervals will likely be fairly minor. The study conducted by my colleagues and I utilized baseline accuracies for real-time histology that were at the lower end of likely effectiveness; nevertheless, real-time histology followed by the resect-and-discard policy for diminutive polyps was clearly more cost-effective than submitting all diminutive polyps for pathologic assessment.

G&H Do you foresee any opposition to forgoing histologic evaluation for diminutive polyps?

DKR It is always difficult to change paradigms and to do something new and innovative. If this policy is supported by future research and officially adopted, there will still likely be resistance to not sending diminutive polyps for histologic evaluation. This resistance will arise in part because the resect-and-discard policy would reduce the number of specimens submitted for pathologic evaluation and would have a financial impact on pathologists as well as gastroenterologists who own histology laboratories. This resistance may diminish when new reimbursement schemes, such as accountable care organizations, become more common in clinical practice and change some of the financial incentives surrounding colonoscopy. Physicians will hopefully keep an open mind toward the resect-and-discard policy because it will improve the cost-effectiveness of colonoscopic practice.

Suggested Reading

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