Improving Quality Outcomes: Assessing Factors Related to Failed Colonoscopy

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Introduction
Among clinicians performing colonoscopy for colorectal cancer (CRC) screening, failure to complete the procedure remains a significant concern. Large-scale reviews have shown rates of incomplete colonoscopy—defined as the inability to achieve cecal intubation and mucosal visualization effectively—between 10% and 20%, well over targets recommended by the US Multi-Society Task Force on Colorectal Cancer. Thus, it is important for clinicians to understand the numerous modifiable physician- and patient-related factors that can lead to colonoscopy failure in order to reduce its incidence and provide patients with improved outcomes.

Multiple Factors Related to Incomplete Colonoscopy
Because effective colonoscopy depends on several events occurring successfully before and during the procedure, the reasons for incomplete colonoscopy can vary. Sidhu et al audited all colonoscopies performed between April 2005 and 2010 at the Royal Liverpool University. Of 8,910 colonoscopies, 693 were incomplete (7.8%; 58% women; mean age, 61 years). Reasons for incomplete colonoscopy included inadequate bowel preparation (24.8%), patient discomfort (22.2%), obstruction (17.2%), presence of diverticular disease (4.3%), adverse events (0.4%), and other (3.2%) or unrecorded (16.9%) causes.

Bowel Preparation
As illustrated by the aforementioned study, insufficient bowel prep remains a major contributor to incomplete colonoscopy. According to a consensus document from 3 leading gastrointestinal societies on bowel preparation for colonoscopy, inadequate bowel preparation can result in failed detection of prevalent neoplastic lesions and has been linked to an increased risk for procedural complications.

Various studies and reviews have attempted to identify predictors of poor colonoscopy preparation and have found that inadequate bowel preparation is more common in patients with the following characteristics: non–English-speaking, Medicaid insurance, single and/or inpatient status, polypharmacy, obesity, increased age, male gender, and comorbidities such as diabetes mellitus, stroke, dementia, and Parkinson’s disease. Additionally, procedure-related factors, such as poor adherence to preparation instructions, erroneous timing of bowel purgative administration, and longer appointment wait times for colonoscopy, were associated with poor bowel preparation. Nevertheless, Hassan et al found that awareness of these and other predictors of inadequate bowel preparation can be used to facilitate effective, targeted bowel preparation programs in order to reduce the risk for incomplete colonoscopy.

Disease-Related Factors
A “difficult” colonoscopy, where reaching the cecum is challenging or not possible, may be related to anatomic and/or disease-related factors. The most common patient-related causes of difficult colonoscopy are endoscope loops or angulation in the colon, limiting effective advancement of the colonoscope. Similarly, diverticular disease may increase the inability to achieve a adequate preparation, possibly due to stool retention in diverticula and/or myochosis which can limit insufflation, making it more challenging to confidently visualize the colonic lumen. Loops and angulations also can test the experience and skill of the endoscopist to navigate the colon successfully. The overall technical skill of the endoscopist, which is dependent on manual dexterity and cumulative experience, is a major determinant of colonoscopy success. Not surprisingly, Shah et al reported that endoscopists who performed a higher volume of colonoscopies experienced fewer incomplete procedures, whereas endoscopists in the lowest volume quintile had incomplete colonoscopy rates of nearly 29%. Interestingly, the same study demonstrated that rates of incomplete colonoscopy were higher in office settings, although the authors concluded this finding might be explained by increased patient discomfort due to reduced levels of sedation used in this setting.

Other studies have reviewed timing aspects related to endoscopist performance. Sanaka et al found that even after accounting for bowel preparation, incomplete colonoscopies were more common when performed in the afternoon. The potential for variation in colonoscopy performance has been judged to be an important issue that led to the recommendation by national agencies for continuous colonoscopy quality improvement monitoring and initiatives to ensure that clinicians who perform colonoscopy remain educated about optimal preparation and procedural techniques.

Effect on Patients and Practice
The consequences of incomplete colonoscopy are potentially profound and widespread. For patients undergoing diagnostic colonoscopy, who have an increased risk for organic gastrointestinal disease, uncertainty and delay in diagnosis can be extremely stressful. Furthermore, some patients who experience unsuccessful colonoscopy might not be willing to undergo a repeat attempt at the procedure. For these patients, failure to detect advanced adenomas or early CRC could lead to poor outcomes and significant risk for morbidity and mortality. Even in patients who do undergo subsequent colonoscopy, a second procedure involves re-exposure to the risk for procedure-related adverse events.

For clinicians, the effects of incomplete colonoscopy can mirror those for patients. Unsuccessful colonoscopy is essentially as costly as well as time- and resource-consuming (ie, patient and physician time, staff and office time, equipment and drug availability) as successful colonoscopy without the same benefits generated by a successful procedure, such as accurate diagnosis, treatment, and primary and secondary prevention of colon cancer. Additionally, as colonoscopy quality measurement becomes more compulsory for practices, incomplete colonoscopy could adversely affect practice quality benchmarking.

Costs
In this evolving era of value-based care, considerable uncertainty exists as to whether payors will continue to reimburse health care providers for unsuccessful colonoscopies, particularly if the cause of procedural failure is deemed to be preventable. As reimbursement often is based on the depth of cecal intubation, incomplete colonoscopy may affect how procedures are billed and coded; incorrect billing and coding could result in an audit of an office’s billing practices. Also, if incomplete colonoscopies are not reimbursed, the payment responsibility for the original procedure and subsequent procedures may transfer to the patient. Therefore, there is a financial incentive for clinicians to perform complete, high-quality colonoscopy as often as possible.
Conclusion

Multiple factors contribute to the small but significant risk for colonoscopy failure, which can have a disproportionate effect on patient outcomes and health care costs. It is incumbent on endoscopists to identify systematic reasons for colonoscopy failure within their individual practices and to address these obstacles in a proactive manner to improve patient outcomes and quality indicators.

References

10. Sanaka MR, Shah N, Mullen KD, et al. Afternoon intubation, liquid and semi-solid stool that obscured the colonic mucosa was encountered. Aggressive irrigation permitted better visualization of the distal colon, but the colonoscopy suction channel repeatedly clogged with effluent and more solid stool was encountered proximally, providing safe advancement of the colonoscope beyond the sigmoid colon. The bowel preparation was deemed “inadequate” and the procedure was aborted. The patient was instructed on various methods to improve the preparation for a repeat colonoscopy, including using a lower volume and split-dose regimen.

Discussion

The patient was given an early morning appointment for a repeat attempt at screening colonoscopy in 1 month. For the repeat colonoscopy, his preparation involved using a low-volume sodium sulfate-based preparation in a split-dose fashion, with the second dose consumed 5 hours before the scheduled appointment. He arrived at the appointed time, and reported being able to follow the instructions and complete the preparation. The second preparation was deemed “excellent,” and two 10-mm tubular adenomas were identified and successfully removed from the ascending and transverse colon.

Although the individual components of bowel preparations vary widely, dietary restrictions and cathartics are the standard combination for colonoscopy preparation. A second dosage of bowel preparation administered as the same day as the colonoscopy (so-called “split-dose”) has been shown to increase the adenoma detection rate and improve preparation tolerability.3,4 When using a split-dose preparation, the standard dosage of a bowel preparation is split between the day before and the morning of the procedure. The second dose must be given early enough for the patient to take the full dosage, have the desired response, and travel to the procedure location, typically 3 to 4 hours before the colonoscopy.3,6

Bowel preparations are inadequate in up to 25% of patients and can result in missed lesions and increased procedural time.7 Patients with inadequate preparation usually require a repeat examination with a more thorough attempt at colonic cleansing. In practice, there are highly variable recommendations regarding timing of follow-up colonoscopy. A recent study suggested that patients who were instructed to repeat colonoscopy the following day were 4 times more likely to adhere to recommendations than patients who were instructed to return after longer intervals.8 It is generally recommended that patients with inadequate bowel preparations be offered repeat colonoscopy examinations within 1 year.9

Disclaimer

The cited case study is hypothetical, illustrative only, and not based on a real existing patient. The purpose of the case is to explicate clinical aspects that might be encountered.

References


Sample Case Study: A 64-Year-Old Man Presenting for Polyp Surveillance Colonoscopy

A patient with a history of an 8-mm sessile adenoma in the ascending colon identified on index colonoscopy 10 years ago presents for surveillance colonoscopy. Diffuse diverticulosis was also identified during the index examination. The patient’s only gastrointestinal complaint was 10 years of chronic constipation (infrequency, straining, and a sense of incomplete evacuation). He denied abdominal pain or hematochezia, and stated that he maintained a high-fiber diet. His medical history was notable for non–insulin-dependent diabetes mellitus, osteoarthritis, and benign prostatic hyperplasia. He was taking metformin 2,550 mg daily, lubiprostone 24 mcg twice daily, pylium 2 lbs daily, and ibuprofen 800 mg as needed. He had no history of abdominal surgery. His physical examination was unremarkable and recent laboratory values were within normal limits.

The patient was instructed to consume 4 L of polyethylene glycol electrolyte lavage solution the night before the colonoscopy. He arrived for his colonoscopy at the appointed time. When asked about his experience with the preparation, the patient said that he was unable to complete the entire preparation due to nausea and that it “didn’t seem to take.” Upon intubation, liquid and semi-solid stool that obscured the colonic mucosa was encountered. Aggressive irrigation permitted better visualization of the distal colon, but the colonoscopy suction channel repeatedly clogged with effluent and more solid stool was encountered proximally, providing safe advancement of the colonoscope beyond the sigmoid colon. The bowel preparation was deemed “inadequate” and the procedure was aborted. The patient was instructed on various methods to improve the preparation for a repeat colonoscopy, including using a lower volume and split-dose regimen.

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Diagnostic accuracy and therapeutic safety of colonoscopy depends, in part, on the quality of the colon cleansing or preparation. The ideal preparation for colonoscopy should reliably empty the colon of all fecal material in a rapid fashion with no gross or histologic alteration of the colonic mucosa, and should not cause any patient discomfort or shifts in fluids or electrolytes. The preparation should be comfortable, tolerable, and inexpensive. It is important for patients to be educated and engaged in the preparation process. Patient counseling along with written instructions that are simple and easy to follow should be provided. Use of visual aids and effective education may significantly improve the quality of preparation.1,2 Additional modifications may be required in special populations, such as diabetic patients, individuals with chronic constipation, or patients with a history of poor bowel preparation.

Disclosures

Dr. Cash reported that he is a consultant for and has received speaker fees from Forest, Ironwood, Salix, and Takeda, and is a consultant for Prometheus.

GASTROENTEROLOGY & ENDOSCOPY NEWS • JULY 2014