

# Adenoma detection rate: is it the master key for the colonoscopy quality indicator?

Su Young Kim, Hyun-Soo Kim

Division of Gastroenterology, Department of Internal Medicine, Yonsei University Wonju College of Medicine, Wonju, South Korea

*Correspondence to:* Hyun-Soo Kim, MD, PhD. Division of Gastroenterology, Department of Internal Medicine, Yonsei University Wonju College of Medicine, 20 Ilsan-ro, Wonju 26426, South Korea. Email: hyskim@yonsei.ac.kr.

*Provenance:* This is a Guest Editorial commissioned by Section Editor Qiang Shi, MD, PhD (Zhongshan Hospital, Fudan University, Shanghai, China).

*Comment on:* Kaminski MF, Wieszczy P, Rupinski M, *et al.* Increased rate of adenoma detection associates with reduced risk of colorectal cancer and death. *Gastroenterology* 2017;153:98-105.

Received: 20 December 2017; Accepted: 03 January 2018; Published: 19 January 2018.

doi: 10.21037/tgh.2018.01.03

View this article at: <http://dx.doi.org/10.21037/tgh.2018.01.03>

Colonoscopy is the most important method for preventing colorectal cancer (CRC) (1). However, colonoscopy is also known to be not flawless technique. According to back-to-back colonoscopy study, a quarter of polyps were missed during colonoscopy (2). In spite of technical improvement, there has been no decrease in the occurrence of missed or early CRC over a 10-year period (3). In addition, the main cause of post-colonoscopy CRCs (PCCRCs) is not completely new lesions but missed lesions (4). The most crucial cause of this phenomenon is the endoscopist related factor. As we already perceive, colonoscopy performance is variable. Therefore, appropriate quality measures are needed to make certain best performance. The American Society for Gastrointestinal Endoscopy (ASGE)/American College of Gastroenterology (ACG) Taskforce demonstrated that three priority quality indicators for colonoscopy: adenoma detection rate (ADR), cecal intubation rate, and adherence to surveillance guidelines (5). These metrics ultimately have the goal of improved detection of CRC and decreased of interval CRC. Concordantly, ADR is the most important metric in terms of the risk prediction of interval CRC after colonoscopy (6).

The ASGE/ACG Taskforce has recommended a new ADR target of 25% (rates of 30% are recommended for men and 20% for women) (5). The ADR is the powerful quality indicator that has been proven to be directly related to interval CRC as ADR greater than 20% was associated with reduction in interval CRC, and ADR is an independent

predictor of the risk of interval CRC after screening colonoscopy (7). Recently large study also showed that ADR was inversely associated with interval CRC, advanced-stage interval cancer, and fatal interval cancer (8). From these rationales and evidences, ADR is increasingly being used to evaluate the quality of colonoscopy.

In an original article published in this issue of *Gastroenterology*, Kaminski *et al.* evaluated whether the increasing ADR from each endoscopist would be associated with diminished risks of interval CRC and death (9). In this study, ADR quintiles were used to categorize the annual ADRs for individual endoscopists. To enhance the colonoscopy performance, annual feedback and quality benchmark indicator were applied. During the enrollment period, 74.5% endoscopists ameliorated their annual ADR quintile compared with baseline. Especially, the proportion of endoscopists in category 5 (it is highest annual category of ADR, ADR >24.56%) increased from 8.1% in 2004 to 31.0% in 2008. Although other factors affecting ADR had not been measured accurately, this was a remarkable achievement. The improvement of annual ADR had a significant impact on interval CRC [adjusted hazard ratio (HR), 0.63; P=0.006] and death (adjusted HR, 0.50; P=0.035). Compared with no improvement, it can be seen that interval CRC risk decreased in reaching (adjusted HR, 0.27; P=0.003) or maintaining (adjusted HR, 0.18; P=0.003) category 5. This study demonstrated significant inverse association between enhanced ADR and the risk of interval

CRC or CRC induced death (9).

This study suggests one more important point for us (9) that the ADR of the same endoscopist can also change, whether it is better or worse. Good thing is that ADR in many endoscopists can be improved through proper feedback and training. This was supported by a large randomized trial showing that colonoscopy training program did improve ADR (10). Importantly, 32.7% of endoscopists showed fluctuations in ADR (9) in Kaminski's finding. This suggests the maintenance of appropriate ADR as a quality indicator of colonoscopy should be emphasized as well and this requires other measures such as quality of bowel preparation, withdrawal time, and endoscopy equipment as well as audit process.

Although ADR has become a fundamental metric of colonoscopy quality, several weak points also exist. ADR requires the linkage of endoscopy and pathology result, therefore it can't be evaluated immediately after colonoscopy. Another issue is "one and done or one-way" phenomenon (11). If endoscopists find the first adenoma, their attention may dwindle because they already obtain the target ADR in the case. This phenomenon leads to a difference of adenoma miss rate (AMR) among endoscopists with the same ADR, and likely increases the risk of interval CRC. Another point we should keep in mind is that all adenomas have no equivalent risk of CRC. Is the risk of CRC of 3 mm size adenoma and 10 mm size adenoma the same? These factors may affect the efficacy of CRC prevention after colonoscopy, even if endoscopists had the same ADR.

The other blind spot of ADR has been complemented by new colonoscopy quality metrics. The measurement of AMR is one of them and a significant AMR was reported during colonoscopy in many endoscopists with high ADR (12,13). However, it is difficult to apply AMR in clinical practice, since we generally do not perform back-to-back colonoscopies on patients. ADR-Plus, the mean incremental adenomas after the first adenoma per colonoscopy, was introduced by Wang *et al.* This indicator is able to retain high adenoma detection even after the first adenoma was found (11). The total number of adenomas per colonoscopy (APC) also has a similar effect, and highly correlated with ADR (14). Although ADR-Plus and APC provide more information than ADR, the calculation is complicated and the correlation with interval CRC remains unclear. The total number of adenomas per positive participant (APP) demonstrated a strong significant inverse correlation with AMRs, therefore, the APP may be a highly-anticipated

quality indicator disentangle delicate endoscopist from one-and-done polyp endoscopist (13). However, APP also has a caveat; if endoscopists with low ADR met patients with numerous adenomas on colonoscopy, they would become outstanding performers all of a sudden.

Although there are some limitations of ADR, it is clear that ADR fulfill most important role as a quality indicator of colonoscopy. Efforts in two aspects is required for strengthening ADR. First, using ADR with other type of metrics may help overcome the blind spot of ADR. ADR alone may be insufficient for a perfect quality indicator, therefore combining ADR with other metrics such as APC and ADR-Plus can implement a complementary role, and increase overall quality of colonoscopy. Second, it is important to raise the quality of ADR itself. In particular, endoscopist dependent factor is principal to maintain adequate colonoscopy quality. As shown in this issue (9), regular feedback and benchmark quality indicators can improve ADR. Despite everyone knows the significance of adequate training and continuous monitoring for the colonoscopy quality, however, these behaviors have real challenges because they require a significant amount of time, cost, and enthusiastic effort (10,14). Moreover, a cost-effective nationwide feedback system and ongoing training programs will be needed beyond ADR, even though ADR already has a solid position in terms of quality indicators.

## Acknowledgements

*Funding:* This study was supported by a grant from the National R&D Program for Cancer Control, Ministry of Health & Welfare, Republic of Korea (HA17C0046).

## Footnote

*Conflicts of Interest:* The authors have no conflicts of interest to declare.

## References

1. Rex DK, Johnson DA, Anderson JC, et al. American College of Gastroenterology guidelines for colorectal cancer screening 2009 [corrected]. *Am J Gastroenterol* 2009;104:739-50.
2. Leufkens AM, van Oijen MG, Vleggaar FP, et al. Factors influencing the miss rate of polyps in a back-to-back colonoscopy study. *Endoscopy* 2012;44:470-5.
3. Pullens HJ, Leenders M, Schipper ME, et al. No decrease

- in the rate of early or missed colorectal cancers after colonoscopy with polypectomy over a 10-year period: a population-based analysis. *Clin Gastroenterol Hepatol* 2015;13:140-7.
4. le Clercq CM, Bouwens MW, Rondagh EJ, et al. Postcolonoscopy colorectal cancers are preventable: a population-based study. *Gut* 2014;63:957-63.
  5. Rex DK, Schoenfeld PS, Cohen J, et al. Quality indicators for colonoscopy. *Am J Gastroenterol* 2015;110:72-90.
  6. Rex DK. Polyp detection at colonoscopy: Endoscopist and technical factors. *Best Pract Res Clin Gastroenterol* 2017;31:425-33.
  7. Kaminski MF, Regula J, Kraszewska E, et al. Quality indicators for colonoscopy and the risk of interval cancer. *N Engl J Med* 2010;362:1795-803.
  8. Corley DA, Jensen CD, Marks AR, et al. Adenoma detection rate and risk of colorectal cancer and death. *N Engl J Med* 2014;370:1298-306.
  9. Kaminski MF, Wieszczyn P, Rupinski M, et al. Increased rate of adenoma detection associates with reduced risk of colorectal cancer and death. *Gastroenterology* 2017;153:98-105.
  10. Kaminski MF, Anderson J, Valori R, et al. Leadership training to improve adenoma detection rate in screening colonoscopy: a randomised trial. *Gut* 2016;65:616-24.
  11. Wang HS, Pisegna J, Modi R, et al. Adenoma detection rate is necessary but insufficient for distinguishing high versus low endoscopist performance. *Gastrointest Endosc* 2013;77:71-8.
  12. Heresbach D, Barrioz T, Lapalus MG, et al. Miss rate for colorectal neoplastic polyps: a prospective multicenter study of back-to-back video colonoscopies. *Endoscopy* 2008;40:284-90.
  13. Aniwaniwan S, Orkoonsawat P, Viriyautsahakul V, et al. The secondary quality indicator to improve prediction of adenoma miss rate apart from adenoma detection rate. *Am J Gastroenterol* 2016;111:723-9.
  14. Coe SG, Crook JE, Diehl NN, et al. An endoscopic quality improvement program improves detection of colorectal adenomas. *Am J Gastroenterol* 2013;108:219-26; quiz 227.

doi: 10.21037/tgh.2018.01.03

**Cite this article as:** Kim SY, Kim HS. Adenoma detection rate: is it the master key for the colonoscopy quality indicator? *Transl Gastroenterol Hepatol* 2018;3:5.