Quality Colonoscopy: Why?

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Introduction

Because colonoscopy has overwhelming benefits on reducing colorectal cancer (CRC) incidence and mortality\(^1,^3\) in general population, most countries have already started or planned population screening programs, in which colonoscopy plays a major role. In the past decade, the colonoscopy practice has been underwent transformation in Korea: national CRC prevention program had successfully been launched and screening colonoscopy have been prevalent, patient experience has improved, and training has been recognized as pivotal part of practice. Moreover, every parties of government, payers, providers, and consumers, related to colonoscopy as a CRC preventive tool, have requested high levels of quality and safety. This trend has been supported by a coordinated approach to both quality improvement and quality assurance. As part of an effort to improve quality in endoscopy area, fortunately, Korean Society of Gastrointestinal Endoscopy (KSGE) suggested validated items for accreditation of endoscopic unit as well as endoscopist in Korea. Moreover, central government support, together with the national screening program, has been critical in the acceleration of these changes. This paper focused on the reasons and targets why we should pursue this hard issue requiring higher costs and efforts as colonoscopists.

1. Colonoscopy is not perfect, but, this should be likely perfect through the quality management.

Although there is strong evidence that colonoscopy has resulted in reduction of CRC incidence, the protective effects of colonoscopy on CRC have not been perfect. Limitations of colonoscopy include higher costs from improper use of surveillance intervals, inadequate bowel preparation and repeated procedures, and the cost of associated pathology and anesthesia or sedation services, operator-dependent polyp detection rate, imperfect detection of lesion and complication risks. In particular, there have been disparate data regarding the efficacy of colonoscopy in the colon proximal to splenic flexure. Majority of recent papers have suggested that colonoscopy does not protect against the right-sided colon cancer,\(^4,^5\) while the others have shown that colonoscopy does protect it as well.\(^6,^9\) Despite of many proven benefits of colonoscopy, it is not a perfect tool for complete protection for CRC development. Some patients may still develop CRC even if they have had clearing colonoscopy with removal of all identified polyps. The reasons for imperfection may be multifactorial; incomplete bowel preparation, missing polyps from behind fold or difficulty with find them, or incomplete resection technique. These immature or unskilled technique or technology can be a probable cause for interval CRC. Recent study from Poland clearly demonstrate the low adenoma detection rate (ADR) is linked to high interval cancer development. Therefore, representative quality indicators including ADR should become essential parts for overall quality improvement in a practice as well as on a national level.

2. High quality colonoscopy may change epidemiologic data and surveillance program of colorectal neoplasia

Despite of meticulous watching, missing of colorectal neoplasia from colonoscopy remains a great concern and reaches up to 24\%.\(^10,^11\) Adenoma detection rate (ADR), a representative quality indicator, has been proved as an important pre-
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dictor for interval CRC after screening colonoscopy. Of importance, interval CRC has been frequently found in the proximal colon, consistent with higher prevalence of missed adenoma in the right side colon. For the purposes of minimizing missing polyp, sorts of technologies which may increase ADR such as chromoendoscopy, high definition endoscopy and image enhanced endoscopy including narrow band image (NBI), autofluorescence imaging (AFI), FICE (Fujinon Intelligent Chromo-Endoscopy) have been examined.

Furthermore, wide angle colonoscopy, retrograde-viewing device and cap assisted colonoscopy have been investigated for more detection of hidden lesions. Chromoendoscopy and cap-assisted colonoscopy (CAC) were readily available so that many studies have evaluated their efficacy for quality indicators. Though recent studies regarding chromo- or cap assisted colonoscopy are open for debates, a series of randomized controlled trials reported that cap assisted method enhanced ADR. Moreover, panchromomeodoscope had better ADRs despite of further time consumption. Based on theoretical advantages of cap assisted chromoendoscopy (CAP-ACE) that may enhance the detection of lesions of flat morphology or behind folds, we conducted a randomized controlled trial comparing CAP-ACE with standard colonoscopy. The CAP-ACE has significantly increased the. In addition, we stratified all the subjects according to the gender and age of 60 years. The highest quality CAP-ACE found not only more adenomas including proximal neoplasia but also more proximal serrated polyps than standard colonoscopy, especially in the subgroup of female older subjects over 60 years. These are of particular importance because several studies have raised concerns regarding the limited effectiveness of colonoscopy for the prevention of proximal CRC. Two of major factors responsible for interval cancer occurrence are endoscopist-related technical factor and biological tumor characteristic of rapid propagation. The latter factor can be possibly associated with proximal serrated polyp which has been reported to grow fast and potentially related to interval cancer.

The detection rates of CAP-ACE from older female were similar to those from older male whereas those were significantly lower by standard colonoscopy which was mainly performed by experts though. These results show the degree of quality even in expert colonoscopists is a primary determinant for epidemiologic data and trends. Furthermore this can be a potential explanation for epidemiologic trends why vast magnitude of screening colonoscopy could not reduce the right side CRC incidence. Therefore, the continuous developments of the colonoscopy with higher quality technologies and a structured analysis for individual cases of interval cancer would ultimately reduce the number of interval CRC as well as correct wrong epidemiologic data from poor quality procedures.

3. High quality may reduce the development of post-colonoscopy CRC, interval cancer.

The causes of post-colonoscopy CRC (PCCRC) or interval cancer is not clearly known, but possible from inappropriate visualization of the whole mucosa, non-polypoid flat lesions, incomplete resection of tumor, or different tumor biology with rapid development and spread. PCCRCs are more likely due to quality component rather than biology. First, the natures (stage and histology) of CRC were not different between patients with PCCRC and those appropriately diagnosed by first colonoscopy. Also, survival was similar, which would favor similar biology. Second, a past colonoscopic polypectomy was related to a higher risk of missed cancer. This suggests lesions were readily visualized but were incompletely removed during the procedure. Finally, missed cancers were more commonly recognized by the colonoscopy done by non-gastroenterologists. Furthermore, the cause of increased proportion of PCCRC in the right-sided colon draws much interests. Prior studies reported lacks of protection against right-sided CRC after colonoscopy. In particular, recent study documented that the gender difference was driven by the increased prevalence of proximal neoplasia among women. Despite some studies have questioned the effectiveness of colonoscopy, particularly in the right colon, recent studies show that a high quality colonoscopy leads to substantial reduction in CRC incidence and mortality. These differences have drawn a focus on quality in colonoscopy that is why experts and national societies, such as the Task Group of the National
Colorectal Cancer Roundtable and American College of Gastroenterology have published metrics for quality, including ADR and cecal intubation rate.

4. Qualified colonoscopy reduces complication risks
Although colonoscopy is reasonably safe, it can be hurdled by a small but definite risks of complication. In particular, suboptimal procedure performance from quality issue, mainly associated with inter-observer capacity, has been related to suboptimal CRC prevention or diagnosis. For this reason, when considering the widespread practice of this technology, a robust policy of risk minimization and quality assurance should be expected to be in place.

5. Health-care payment will be reformed based on colonoscopy quality
Colonoscopist performance varies and it can be affected by healthcare payment systems that reward volume based upon payment per service in Korean national health insurance system, rather than quality. Problems with the quality of colonoscopy are well known and recognized. Payment reform has emerged as one strategy to address these and more systemic problems in the quality of health care. As countermeasures to this issue, government, payers, providers, and consumers have requested structural changes to the healthcare system to close this quality gap and prepare the increasing expenses of healthcare provision. In the near future, value-based healthcare purchasing and assessment system in colonoscopy will be introduced and this may encourage a paradigm changes of medical insurance fee and reimbursement based on incentives which is directly linked with clinically significant quality indicators of colonoscopy in Korea. Recently, these quality measures are emphasized in an effort of lessening the gap of colonoscopy efficacy, effectiveness and cost because these measures are valid and reliable indicators of the quality colonoscopy for not only CRC screening but also surveillance. Therefore, we need to prepare for payment reform in Korea which definitely links performance on quality measures to payment for colonoscopy.

6. Quality is essential not only for credentialing the trainee but also for recertification the colonoscopist.
Much emphasis is being integrated on independent medical practitioners to demonstrate quality and competence. Practically, through the national audits, performance could be better and the assessment of skills to standards is particularly relevant. After the introduction of a National Bowel Cancer Screening Programme (BCSP) in England in 2006, for example, BCSP raised the issue of potential harm to screened individuals because the colonoscopy has a potential for serious morbidity and mortality. Furthermore, a national audit of colonoscopy demonstrated variable quality of practice extrapolating complication rates, 2 or 3 deaths per the estimated 30,000 screening colonoscopies annually. Therefore, the BCSP required aspirant screening colonoscopists to undertake an assessment of competence. The proposed assessment created strong feelings in the endoscopy community in the United Kingdom, with concerns about the appropriateness and robustness of the process and about the unintended consequences on candidates’ endoscopic practice outside the screening program. It was therefore crucially important to investigate the robustness of the accreditation process. To ensure a high-quality screening program and both public and professional acceptability, a psychometrically sound summative assessment tool was developed and validated. Assessment drives learning and may be the most powerful factor in an entire curriculum. The use of such an assessment could be a very powerful way to improve colonoscopy quality overall. The report from American Society for Gastrointestinal Endoscopy (ASGE) published in 2012 include specific requirements that should be met for a competent program, such as indication and contra-indications, complications, sedation/analgesia issues, and quality measurement. It has been proposed that a minimum of 200 colonoscopies should be reached in order to assess competence, while recent study from Sedlack using a form that assesses cognitive and motor skills for colonoscopy concluded that competence is attained with 275 colonoscopies. With the objective of comparing the
quality of colonoscopy performance among gastroenterology and surgical trainees, a study recognized that colonoscopies performed by non-gastroenterologists show a lower completion rate and lower ADR compared to colonoscopies performed by gastroenterologists. These results highlight the need for more stringent standards for training and assessment of competence to perform more qualified colonoscopic screening for colorectal neoplasia.

**Conclusions**

The advent of national CRC screening programs, requiring a high level of quality achieved for each step of the program, represents a unique chance to implement quality measures for colonoscopy with a systematic and consistent approach worldwide. The component for quality control programs seems obvious when considering the massive volume of endoscopic procedures resulting from CRC screening, which demonstrate an additional challenge to already overloaded endoscopic centers. The clear evidence suggesting the association between colonoscopy quality and the efficacy and safety of the procedure in preventing CRC reveals a strong incentive for nationwide action for quality assurance programs.

In summary, the major reasons why we should act qualified colonoscopy more than just pursuing are: First, this test is not a perfect one. Therefore, this test should be equipped with optimal standards of practice including quality indicators or benchmarks for the full grade of technical competency. Second, the gap between the ideal and practice of colonoscopy has been emphasized by the missed lesion and interval CRC so that the gap be lessened by guaranteed high quality procedures. Finally, we colonoscopists as health-care provider must take the advantageous position by preparing for payment reform which definitely links performance on quality measures to payment for colonoscopy in the near future. Further research is required to establish the component skills, attitudes, and behaviors for high-level mucosal inspection competence necessary for training and assessment. Also, interventions to bridge the gap between efficacy and effectiveness should emphasize quality measurement and operate at various levels within the health system to motivate change in endoscopists' behavior.

**References**