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Interobserver Agreement in Using Magnifying Narrow Band Imaging System

Il Ju Choi

Center for Gastric Cancer, National Cancer Center, Goyang, Korea

See "Observer Variability in Gastric Neoplasm Assessment Using the Vessel Plus Surface Classification for Magnifying Endoscopy with Narrow Band Imaging" by Chan Hui Yoo, Moo In Park, Seun Ja Park, et al., on page 74-78

Gastric cancer is the second most common cancer in Korea, but mortality due to gastric cancer is decreasing. This phenomenon is probably a result of the National Cancer Screening Program, which provides biennial endoscopic screening and facilitates early detection of gastric cancer that can be cured by endoscopic treatment or minimally invasive surgery.[1] During the endoscopic screening, precancerous lesions including low-grade adenomas are commonly found, which can be differentiated from high-grade dysplasia or invasive carcinomas by histological evaluation after collecting a biopsy specimen. However, even a biopsy-confirmed low-grade adenoma can be identified as a high-grade dysplasia or carcinoma using full pathological evaluation after endoscopic resection.[2] A low-grade adenoma usually can be treated using a less invasive modality such as argon plasma coagulation in the outpatient setting.[3] Alternatively, low-grade adenomas can be followed up without any invasive treatment in elderly patients with comorbid conditions including cardiovascular disease that need antiplatelet or anticoagulant therapy, which imposes a higher risk of postprocedural bleeding after endoscopic resection.[4]

Using a narrow band imaging (NBI) system, endoscopists can evaluate the mucosal microvascular (MV) architecture and microsurface (MS) structure as well as demarcation lines (DL) between the lesion and the surrounding background mucosa.[5] NBI is useful for the diagnosis of upper gastrointestinal diseases including superficial esophageal squamous cell carcinomas (SESCC),[6] Barrett esophagus,[7] chronic gastritis associated with *Helicobacter pylori* infection,[8] or early gastric cancers (EGCs).[9] Magnifying NBI (M-NBI) allows endoscopists to observe detailed morphological features using the aforementioned criteria, which can lead to histologic diagnosis that can be used to differentiate carcinomas, from benign lesions, including adenomas.[10-12] A recent prospective study using real-time analysis suggested that M-NBI in combination with conventional white light imaging (C-WLI) was used to identify the small, depressed type of EGCs with >95% accuracy, sensitivity, and specificity.[13] Identification of the DL and then subsequent inspection of an irregular MV pattern diagnosed using DL was an efficient strategy to identify the small, depressed type of EGC.[14]

A consensus report about the role of NBI in the Asia Pacific region for the diagnosis of early-stage esophagogastric cancer was published recently.[5] For SESCC, most of the expert panels agreed that NBI is useful for detecting and determining the extent of SESCC. M-NBI can be very useful for determining the tumor depth of SESCC. NBI is not useful for detecting EGC, as the view of NBI is usually dark because the gastric lumen is wide and the mucosal capillaries are rich and absorb the narrow-banded blue and green light. However, most experts agree that M-NBI can be helpful for distinguishing gastric neoplasia from nonneoplasia and for determining the extent of EGC. In contrast to its usefulness with SESCC, M-NBI is not useful for diagnosing the tumor depth of EGC because the invasive tissue is often unexposed at the surface and mucosal structures remain even after submucosal invasion.[5]

Although M-NBI is expected to improve the quality of endoscopic diagnosis and treatment of gastric neoplasms, some limitations exist.[15] The major drawbacks are that the studies

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Correspondence: Il Ju Choi
Center for Gastric Cancer, National Cancer Center, 323 Ilsan-ro, Ilsandong-gu, Goyang 410-769, Korea
Tel: +82-31-920-2282, **Fax:** +82-31-920-1520, **E-mail:** cij1224@ncc.re.kr

have been conducted in a limited number of groups and interobserver reliability is low.[15] In a paper published in *Clinical Endoscopy*, Yoo et al.[16] evaluated the observer variability using the M-NBI system in the differentiation of gastric low-grade adenoma from high-grade dysplasia or carcinoma. The authors retrospectively selected 47 cases of adenomas or carcinomas in which preoperative M-NBI was performed. Before assessment, a 20-minute training module was given to seven endoscopists (two experts and five trainees); assessment was repeated 2 weeks after the initial assessment. The results showed that intraobserver agreement was quite significant, with a mean κ value of 0.69 (experts, 0.74; trainees, 0.64). The mean κ value for interobserver agreement was 0.42, indicating moderate agreement (experts, 0.49; trainees, 0.40). The authors reported reliable results considering observer variability, with only brief training on the vessel plus surface (VS) classification using the combined MV and MS criteria. The VS classification appears to provide an objective assessment of M-NBI for trainees who are not familiar with M-NBI.

This study has several limitations. First, this study lacks the diagnostic data using C-WLI. Usually, low-grade adenomas show flat elevated morphology without the presence of erythema or ulcers. As the authors already suggested, the lesions included in this study have such characteristics that can be easily differentiated using C-WLI. Moreover, evaluation of the MV pattern is more difficult in the elevated type. Second, this is a retrospective study, which is vulnerable to selection bias. To reduce the bias, an endoscopist who did not perform endoscopy selected two static images per case. However, static images taken by experienced endoscopists may best depict the lesion. During endoscopy, inexperienced endoscopists may not be able produce these images by themselves. Therefore, a prospective study using real-time analysis is needed to confirm the results of this study. Third, the detailed histological characteristics of carcinoma are not available. High-grade dysplasia or noninvasive carcinoma of Vienna classification 4 and differentiated type carcinoma of Vienna classification 5 may be good candidates for M-NBI assessment.[17] However, the VS pattern of undifferentiated adenocarcinoma might be unclear as the subepithelial spread of tumor cells might not be reflected on the surface pattern.[5] Despite these limitations, this study suggested that the proposed VS system seems to be easily learned and useful even for inexperienced endoscopists. Further real-time studies involving a large number of EGC cases are needed to confirm the results of this study.

Conflicts of Interest

The author has no financial conflicts of interest.

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