ORIGINAL ARTICLE

Low magnification narrow band imaging by inexperienced endoscopists has a high accuracy in differentiation of colon polyp histology

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Summary

Background/objective: Several studies have shown that NBI can predict the colorectal polyp histology with moderate to high accuracy. Most of them were conducted by highly experienced endoscopists at academic centers by using high magnification colonoscopes. We evaluated the accuracy of standard definition low magnification NBI in predicting the real time histology of colorectal polyps when used by inexperienced endoscopists and whether it can meet the thresholds recently defined for discard, resect and discard strategies of diminutive polyps by ASGE.

Methods: The study was a prospective observational trial and involved 430 patients who underwent colonoscopy. A total of 214 polyps were detected in 317 patients. Colonoscopies were performed by a gastroenterology attending physician and two fellows who had no experience in NBI. Standard definition low magnification colonoscopes were used. The endoscopists recorded the size, Paris classification, and location of polyps under white light and consecutively described the superficial mucosal architecture and vascular pattern based on NBI International Colorectal Endoscopic criteria.

Results: The overall accuracy of NBI in predicting adenomatous histology was 93.4%. The negative predictive value for diagnosing adenomatous histology in diminutive rectosigmoid polyps (93.3%) and the accuracy in predicting the colonoscopy surveillance interval (92.3%) were above the threshold levels defined by ASGE.

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Conclusions: Low magnification NBI by inexperienced endoscopists has a high accuracy in predicting in vivo colorectal polyp histology encouraging its use in routine clinical practice.

Introduction

Accurate in vivo prediction of polyp histology may prevent the removal of insignificant hyperplastic polyps detected in the distal colon (discard strategy) or the need for histologic assessment of diminutive polyps (resect and discard strategy), which decreases the duration, cost, and risks of colonoscopy [1]. Dye-chromoendoscopy and electronic chromoendoscopy are the advanced endoscopic imaging techniques, which have been used for the differentiation of in vivo polyp histology. Although dye-chromoendoscopy gained acceptance among Japanese endoscopists, it has not been embraced in routine clinical practice in Western countries because of several possible reasons such as unavailability of high magnification endoscopes, long learning curve of the technique and the additional time and labor needed for dye application. Narrow band imaging (NBI) is a simple 'push of a button' electronic chromoendoscopy technique which uses optical narrow band light filters for more detailed visualization of the superficial mucosal architecture and vascular pattern. It is less time consuming compared to dye-chromoendoscopy and only 20-minutes of teaching session can be enough to achieve high accuracy in defining specific polyp patterns [2]. Several studies have shown that NBI can predict polyp histology with moderate to high accuracy [3–9]. But the sensitivity and specificity varies according to the level of magnification. A recent meta-analysis of 20 studies found that low magnification (LM)-NBI had a sensitivity and specificity ranging between 61% and 91%, and between 32% and 98%, respectively [10]. These data have a high degree of variability depending on the methodology of the studies therefore it is not possible to conclude whether LM-NBI can meet the thresholds of American Society for Gastrointestinal Endoscopy (ASGE) for discard, resect and discard strategies [1]. Although high magnification (HM)-NBI was found to be superior to LM-NBI in a head to head comparison, it cannot be routinely used in clinical practice because of the nonavailability of HM-endoscopes outside reference centers in most of the time [11].

In this study, we conducted a prospective observational trial in order to evaluate the accuracy of standard definition LM-NBI in predicting the histology of colorectal polyps in real time. Our secondary aim was to determine whether NBI can meet the thresholds of ASGE for discard, resect and discard strategies in community practice; use of a LM-endoscope by gastroenterologists with no experience in NBI.

Methods

Study design/setting

We conducted a prospective, observational study in patients who had undergone colonoscopy at Gastroenterology Department of Türkiye Yüksek İhtisas Hospital between October 2012 and January 2013. The study protocol conforms to the ethical guidelines of the 1975 Declaration of Helsinki. Patients gave informed consent and the study was approved by the Institutional Review Board.

Participants

The study group included patients who had undergone elective colonoscopy for screening, surveillance or evaluation of symptoms. Exclusion criteria were history inflammatory bowel disease, colectomy, colon cancer, or polyposis syndrome, use of antiplatelet or anticoagulant drugs that precluded removal of polyps, presence of poor general condition or any other reason to avoid prolonged procedure time and inability to give informed consent. Patients with inadequate bowel preparation, malignant-appearing mass or in whom the cecum could not be reached or those who underwent polypectomy but the polyp could not be retrieved for histopathologic analysis was also excluded.

Colonoscopy procedure

Colonoscopies were performed by an experienced gastroenterology attending physician and two gastroenterology fellows. Gastroenterology attending physician had no experience with colon NBI or intravital chromoendoscopy. Gastroenterology fellows' levels of training were third year. They performed approximately 500 colonoscopy procedures and had also no experience with NBI. Gastroenterology attending physician made a detailed literature search and explained the findings to the fellows in a 20-minute interactive teaching session in which the criteria for differentiation of polyps were reviewed by using a set of photographs obtained from the literature. Colonoscopies were performed by using standard definition colonoscopes (Olympus GIFFQ2602), Evis Lucera CV-260SL video processor and high-definition LCD monitor (OEV191H, Olympus Medical System Corp, Tokyo, Japan).

The endoscopists first screened the colon with standard definition white light. If a polyp was detected during this examination, they recorded the size, morphology, and location of it. The size of the polyp was estimated by comparing it to the size of the open biopsy forceps. Morphology was classified according to Paris classification [12]. Locations of the polyps were estimated by depending on the anatomic landmarks. Polyps within or proximal to the splenic flexure are defined as right-sided polyps whereas those distal to the splenic flexure as left-sided polyps. Endoscopists then switched to LM-NBI and predicted the histology of each polyp in real time. Electronic or optic magnification was not used.

Prediction and assessment of histology

The histology of each polyp was predicted according to the superficial mucosal architecture and vascular pattern recently defined by NBI International Colorectal Endoscopic