Accuracy in In-Vivo Optical Diagnosis of Colon Polyp Histology by Narrow Band Imaging (NBI) in Predicting Colonoscopy (CC) Surveillance Intervals (SI)


Background: NBI has been shown to predict polyp histology with moderate to high accuracy. However, there is limited data assessing the accuracy of NBI in predicting SI. Aim: To determine accuracy of In-Vivo optical diagnosis of colon polyp histology with NBI for predicting SI Methods: Polyps undergoing either screening or surveillance CC at 2 tertiary referral centers were prospectively enrolled by 6 endoscopists from Nov 2007 to Oct 2010 in one of 3 clinical trials investigating new novel imaging techniques on polyp detection and/or polyp histology prediction. Location, size, and morphology of each polyp detected was documented. Using a simple NBI surface mucosal vascular pattern classification described earlier (standardized among all 6 endoscopists) an optical diagnosis of polyp histology was made in real-time. Each polyp was then reset, sent in a separate jar for histopathology. SI for future CC was calculated based on optical diagnosis and histopathological diagnosis (gold standard), and these were compared employing various hypothetical strategies using the US Multi-Society Task Force Guidelines on colorectal cancer screening SI and prevention of colorectal cancer. Results: 473 pts (294 (62.2%) pts with polyps) underwent CC with In-Vivo optical diagnosis of every polyp detected. Mean age 61.1 yrs (SD 8.3), 383 (81.0%) male, 313 (74.8%) Caucasian. 807 polyps were evaluated (550 adenoma, 224 hyperplastic, 50 no diagnostic abnormalities, 35 other benign pathology). Overall sensitivity, specificity, and accuracy of NBI for predicting adenomas were 95.4% (95%CI 91.0 - 95.3), 86.1% (95%CI 81.7 - 89.0), and 90.8% (95%CI 86.8 - 92.6) respectively. If the practice is to perform repeat CC in 3 yrs for pts with ≥ 3 adenomas or one or more advanced adenomas, and 5 yrs for pts with 1-2 small adenomas (Guideline A) - then 91 pts (19%) would undergo repeat CC in 3 yrs, 131 (28%) in 5 yrs, and 251 (33%) in 10 yrs. If the practice is to perform repeat CC in 3 yrs for pts with ≥ 3 adenomas or one or more advanced adenomas, and 10 yrs for pts with 1-2 small adenomas (Guideline B) - then 91 pts (19%) would undergo repeat CC in 3 yrs and 382 (81%) in 10 yrs. Table 1 shows the accuracy of NBI in predicting SI and the number of polyps that would need to be sent for histopathological evaluation employing several hypothetical strategies listed for both guidelines A and B. Conclusion: Using NBI for optical diagnosis of colon polyps can achieve a high degree of accuracy for predicting SI. This practice of predicting histology real time during CC, and then reserving and discarding polyps can significantly reduce the number of polyps sent for histopathological evaluation and may subsequently improve the cost-effectiveness of colon cancer screening.

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