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Retrospective Study

Prediction of colorectal tumor grade and invasion depth through narrow-band imaging scoring

Maeyama Y *et al.* Prediction of colorectal tumor by NBI

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PREDICTION OF TUMOR GRADE AND INVASION DEPTH OF COLORECTAL TUMORS THROUGH THE SCORING OF NARROW-BAND IMAGING FINDINGS



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Background: Numerous studies have indicated the usefulness of magnifying endoscopy with narrow-band imaging (NBI) in the endoscopic diagnosis of colorectal tumors. However, these reports are difficult to interpret for precise diagnosis in clinical practice, as they describe a variety of different endoscopic findings and classify them into different categories. We conducted the present study to examine the usefulness of assigning scores to significant NBI findings for predicting tumor grade and invasion depth in patients with colorectal tumors. **Methods:** We recruited 138 patients with colorectal tumors (161 lesions, consisting of 81 adenomas and 80 cancers), who underwent endoscopic or surgical resection of the tumors after conventional colonoscopy and magnifying endoscopy with NBI. The relationship between the surface and vascular patterns of the lesions as visualized by NBI, with the tumor grade (i.e., adenoma or cancer) and depth of submucosal invasion (i.e., $<1000\ \mu\text{m}$ or $\geq 1000\ \mu\text{m}$), as visualized on histopathology, were analyzed by multivariate analysis using a logistic regression model followed by stepwise selection of variables related to the NBI findings. A score was determined based on the estimated statistical values, and a model was developed for predicting tumor grade and invasion depth of colorectal tumors. Furthermore, the relationship between the NBI findings with the tissue architecture assessed by histopathology was also analyzed. **Results:** Tumor grade was associated with "regular/irregular" surface patterns, as well as the "avascular area" vascular pattern. Deep submucosal invasion was associated with the "disrupted vessel" and "thick vessel" vascular patterns. When evaluating the diagnostic capability of the model developed for predicting the tumor grade, the sensitivity and specificity of a total NBI finding score of ≥ 1 were 0.97 and 0.24, respectively, for the diagnosis of cancer. In the evaluation of the diagnostic capability of the model for predicting invasion depth, the sensitivity and specificity of a total NBI finding score of ≥ 9 were 0.56 and 1.0, respectively, for predicting a depth of submucosal tumor invasion of $\geq 1000\ \mu\text{m}$. Close associations were also noted between the NBI findings selected in this study and the histological architecture of the tumorous area. **Conclusion:** These results suggest that the scoring system for significant NBI findings proposed in this study is useful for predicting the tumor grade and invasion depth in patients with colorectal tumors, and therefore also for determining the optimal therapeutic strategy. In the future, it would be desirable to conduct prospective studies involving a larger number of patients.

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