Magnifying Endoscopy with NBI: Based on the Histopathologic Background

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Introduction

The standard method of endoscopic diagnosis in the digestive tract has been white light endoscopy. On white light imaging differential diagnosis between cancer and non-cancer for suspicious lesions is established according to surface morphology and color.

Main body

Because superficial lesions often show indistinct features, attentions should be paid to subtle differences in mucosal height and discoloration (faint redness or paleness). Diagnostic criteria for cancerous lesions in white light image are: 1) presence of a well-demarcated area and 2) irregularity in surface morphology or color, and a presumptive diagnosis of cancer can be established if a lesion fulfills both criteria. Indigo carmine chromoendoscopy can further enhance surface morphological features, however it is sometimes not useful for totally flat lesions. The detailed microsurface structure and microvascular architecture of the lesions, that closely correspond to histological findings of the lesions are best evaluated on magnifying NBI imaging. According to the “vessel plus surface” (VS) classification presence of a clear peripheral demarcation line and irregular microsurface or microvascular patterns are diagnostic criteria for cancerous lesions on magnifying NBI. When a lesion fulfills both criteria, a diagnosis of cancer is made. Sensitivity of the demarcation line is greater than the irregular microvascular patterns, whereas the specificity of the irregular microvascular pattern is greater than that of the demarcation line. In practice, demarcation line features are easier to evaluate than irregular microvascular patterns. Accordingly, identification of a demarcation line and subsequent inspection of irregular microvascular patterns in the lesion is the preferred strategy for a magnifying NBI diagnosis of superficial cancer in the digestive tract. Magnifying NBI provides improved diagnostic accuracy for early gastric cancer (sensitivity of 83%, specificity of 96%, and AUC of 0.96) in comparison with white light imaging (sensitivity 48%, specificity 67%, and AUC 0.62).
Conclusion

Magnifying NBI enables evaluation of detailed microsurface structure and microvascular architecture of the lesions that correspond with histology, and is especially useful for making diagnosis of flat lesions that do not show apparent changes in surface morphology or color.

References