

“LIGHT BLUE CREST” SIGN FOR DIAGNOSIS OF GASTRIC INTESTINAL METAPLASIA USING MAGNIFYING ENDOSCOPY WITH I-SCAN OPTICAL ENHANCEMENT

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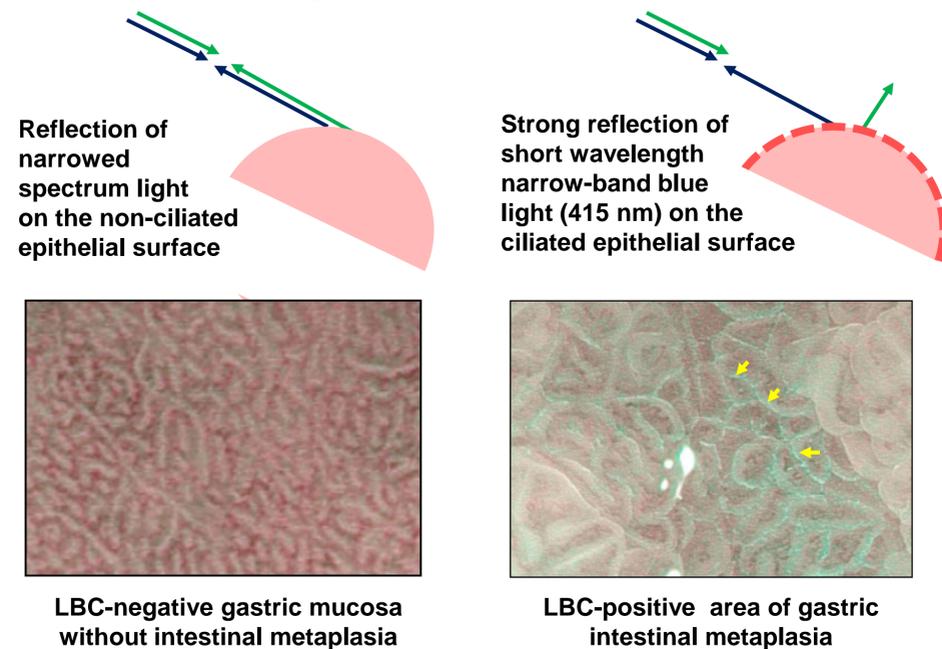
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BACKGROUND. Gastric intestinal metaplasia (GIM) is considered as a premalignant condition and associated with a high risk for the development of gastric cancer [1]. However, conventional white light imaging endoscopic features of GIM has a high rate of interobserver variability and correlates poorly with the histology. Uedo et al. first described “light blue crest” (LBC) sign as highly accurate sign of the presence of histological GIM using magnifying endoscopy and narrow band imaging (NBI) system with a monochrome CCD and rotary RGB filter [2]. However the possibility of LBC detection and its efficacy in diagnosis of GIM with other narrowed spectrum technologies were not fully investigated.

Definition of “light blue crest”

LBC was defined as an optical phenomenon caused by the reflectance of narrowed spectrum light on the ciliated surface of the epithelium that can be seen at the tangential observation of edge of the surface.

Fig. 1. Optical phenomenon of LBC



LBC was defined as a fine, blue-white line on the crests of the epithelial surface/gyri [2] (Fig.1, yellow arrows).

AIMS AND METHODS. The aim of this study was to evaluate the diagnostic efficacy of LBC in diagnosis of GIM with magnifying i-scan optical enhancement (Fig. 3) endoscopy (PENTAX Medical, Japan). 86 gastric lesions in 46 patients (mean age 52.1 years, SD=10.2, 54% male, 46% female) were observed with magnifying i-scan optical enhancement endoscopy (EPK-i7010, endoscope EG-2990Zi, PENTAX Medical). Presence of LBC were assessed by two endoscopists (R.K. and S.K.), cases with low confidence of LBC diagnosis was consulted with developer of the concept of “LBC sign” (N.U.). Forceps biopsy was performed for a histological evaluation of lesions.

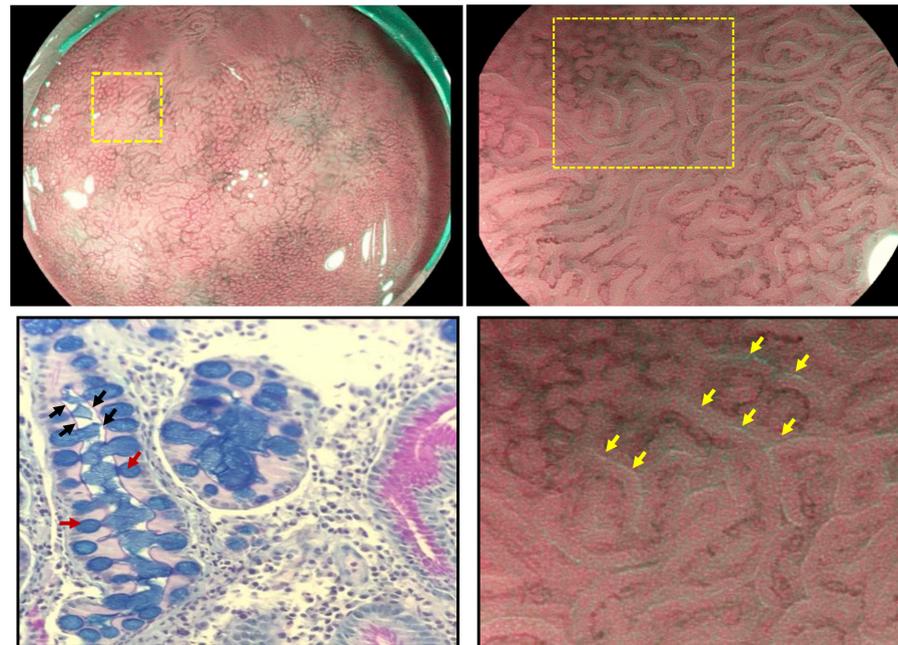
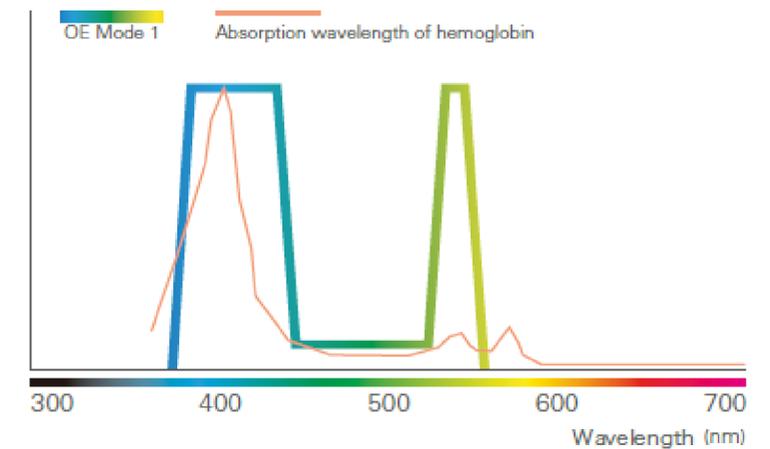


Fig. 2. Gastric intestinal metaplasia: a. Non-magnified endoscopy in i-scan OE mode; b, c. Magnified endoscopy in i-scan OE mode: LBC visualized as fine, blue-white line on the crests of the epithelial surface (yellow arrows); d. Histology (AB/PAS stain): intestinal metaplasia with the brush border of the absorptive cells (black arrows) and numerous goblet cells (red arrows)

Fig. 3. Spectrum of illumination in i-scan OE mode



RESULTS. From 86 gastric lesions complete GIM was confirmed in 14 cases, incomplete GIM – in 8 cases, mixed GIM – in 9 cases. LBC was diagnosed in 22 cases (all lesions with confirmed GIM). Sensitivity, specificity, accuracy, positive predictive value, negative predictive value for LBC sign in diagnosis of GIM were 0.71, 1.00, 0.90, 1.00, 0.86, respectively (example of GIM with LBC see on fig. 2).

CONCLUSION Magnifying endoscopy with i-scan optical enhancement technology provides accurate diagnosis of GIM by using LBC sign. Further studies are needed to evaluate the efficacy of different previously described endoscopic features of IM using new optical technologies.

References:

1. Pimentel-Nunes P., et al. Endoscopy. 2019 Apr;51(4):365-388.
2. Uedo N., et al. Endoscopy. 2006 Aug;38(8):819-24.

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