LCI® in Clinical Studies

Published in *Gastrointestinal Endoscopy*, Vol. 91, Issue 6, AB593:

Addition of Linked Color Imaging to White Light Endoscopy Improves Delineation Performance of Early Gastric Cancer Lesions by Non-Expert Endoscopists

Author(s): Kiki Fockens[1], Maarten Struyvenberg[1], Jeroen de Groof[1], Tsevelnorov Khurelbaatar[2], Nahid Mostafavi[1], Hisashi Fukuda[2], Yoshimasa Miura[2], Takahito Takezawa[2], Wouter Curvers[3], Jacques Bergman[1], Hironori Yamamoto[2]

1 Gastroenterology, Amsterdam UMC, Amsterdam, Netherlands

2 Jichi Medical University, Yakushiji, Japan

3 Catharina Hospital, Eindhoven, Netherlands

Abstract # Tu1501 from DDW® 2020

Background & aim: Early gastric cancer lesions are subtle, focally distributed, and poorly visible endoscopically. Therefore, endoscopists have difficulties evaluating these subtle early gastric cancer lesions. The aim of this study was to evaluate the role of linked color imaging (LCI) for the visualization of early gastric cancer in comparison to white light endoscopy (WLE) alone, when assessed by non-expert endoscopists.

Methods: 40 unique cases of early gastric cancer, visualized in both WLE and LCI, were collected for this study. To establish ground truth, all cases were delineated by three expert endoscopists from Japan. Using a web based module, these cases were delineated by 48 non-expert endoscopist assessors of four different countries (Japan, Netherlands, Portugal and Sweden). Endoscopic expertise was divided into different levels: fellow in training, junior endoscopist and senior endoscopist. The module consists of three assessment phases, with a wash-out period of 2 weeks in between each phase. Assessment 1: WLE alone; Assessment 2: LCI alone; Assessment 3: WLE+LCI in a side-to-side display. The outcomes of this study were: 1) overlap between assessors' delineation and expert ground truth; 2) assessors' delineation performance in terms of differentiating between neoplastic tissue and normal tissue; 3) ability to delineate the lesions (VAS-scores 1-10); 4) assessors' preferred imaging modality (WLE, LCI or no preference).

Results: Linear mixed-effect models showed a significant increase in assessors' delineation performance from 77% (SD 26%) in WLE alone and 75% (SD 28%) in LCI alone to 81% (SD 24%) when combining both imaging modalities ($P < 0.001$). When differentiating neoplastic from non-dysplastic tissue, the combination WLE+LCI also caused increased performance scores (49% in WLE and 49% in LCI to 53% in WLE+LCI; $P < 0.001$). Japanese assessors performed significantly better than Dutch, Portuguese and Swedish assessors when delineating early gastric cancer lesions, regardless of imaging modality (87% vs. 71%, 72% and 73% respectively; $P < 0.001$). There was no distinction between the different levels of endoscopic expertise. Median VAS scores were higher for phase 2 (6; IQR 5-8) and 3 (7; IQR 5-8) compared with phase 1 (5; IQR 3-7) for the ability to delineate the lesion ($P < 0.001$). Assessors preferred LCI over WLE (72.4% vs. 5.2%, 22.4% no preference) for the appreciation of early gastric cancer lesions.

Conclusion: The combined use of WLE and LCI resulted in enhanced delineation of early gastric cancer lesions by non-expert endoscopists. Although assessors appreciated the ability of LCI for delineation better than WLE, there was no difference in separate delineation scores for LCI and WLE.

To view the full text, visit:
https://www.giejournal.org/article/S0016-5107(20)33913-4/fulltext

Continued on next page

FUJIFILM SUMMARY

Endoscopists may have trouble evaluating early gastric cancer lesions due to their subtle nature. This study focused on non-expert endoscopists comparing LCI to white light endoscopy (WLE) for visualizing early gastric cancer.

Key Takeaways:

1. When WLE + LCI were combined, there was a significant increase in assessors' delineation performance [WLE 77%, LCI 75%, WLE + LCI 81%].
2. The combination of WLE + LCI caused an increase in performance scores when differentiating neoplastic from non-dysplastic tissue [WLE 49%, LCI 49%, WLE + LCI 53%].
3. Median VAS scores, showing ability to delineate the lesions, were higher for LCI only [6] and WLE + LCI [7], compared to WLE alone [5].
4. Assessors preference was LCI [72.4%] over WLE [5.2%] [22.4% had no preference]

Digestive Disease Week® (DDW®) is the largest international gathering of physicians, researchers and academics in the fields of gastroenterology, hepatology, endoscopy and gastrointestinal surgery. Jointly sponsored by the American Association for the Study of Liver Diseases (AASLD), the American Gastroenterological Association (AGA) Institute, the American Society for Gastrointestinal Endoscopy (ASGE) and the Society for Surgery of the Alimentary Tract (SSAT), the meeting showcases more than 5,000 abstracts and hundreds of lectures on the latest advances in GI research, medicine and technology. More information can be found at www.ddw.org.