Abstracts | ESGE Days 2023

Oral presentation

Small-Bowel Endoscopy: Updates 2023 20/04/2023, 15:30 – 16:30 Liffey Meeting Room 2

Artificial intelligence-assisted small bowel capsule endoscopy reading in patients with suspected small bowel bleeding

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Aims Capsule endoscopy (CE) reading is time consuming, and readers are required to maintain attention to not miss significant findings. Deep neural networks (DNNs) can recognize relevant findings, possibly exceeding human performances, reducing the reading time of CE. Primary aim of this study was to assess the non-inferiority of Artificial intelligence (AI)-assisted vs standard reading for the detection of potentiallly bleeding lesions at per-patient analysis. Secondary aim was to compare the mean reading time in the two modalities.

Methods From February 2021 to January 2022, 137 patients were prospectively enrolled from 14 European centers to perform small bowel (SB) CE with the Navicam SB system (Ankon, China), provided with a DNN-based system (ProScan) for automatic detection of lesions. Initial reading was performed in standard mode. Second blinded reading was performed AI-assisted (AI operated a first-automated reading, and only AI-selected images were assessed by human readers). Finally, a board ofexperts review all videos and served as gold std) [1].

Results 133 patients were included in the final analysis (73 females, mean age 66.5 years±14.4 SD; completion rate 84.2%). At per-patient analysis, the diagnostic yield of P1+P2 lesions in AI-assisted reading (73.7%, n=98/133) was non-inferior (p=0.015) and superior (p=0.035) to standard reading (62.4%, n= 83/133). Negative predictive values of standard and AI-assisted reading were 56% and 80%, respectively (p=0.039). Mean SB reading time was 33.7±22.9 minutes in standard mode and 3.8±3.3 minutes when AI-assisted (p<0.001) ([Fig. 1]).

Accuracy measures (%)	P1+P2 lesions			P2 lesions		
	Standard reading	AI assisted reading	p value	Standard reading	AI assisted reading	p value
Sensitivity	79.0	93.3	0.005	84.6	89.2	0.603
Specificity	100.0	100.0	1	100.0	100.0	1
PPV	100.0	100.0	1	100.0	100.0	1
NPV	56.0	80.0	0.039	87.2	90.7	0.668
Diagnostic accuracy	83.5	94.7	0.006	92.5	94.7	0.616

Fig. 1

Conclusions The AI-assisted reading achieved a statistically significant increase in the detection of clinically relevant findings and the reading time was 8.8 times faster. (NCT 04821349)

1 Ding Z, Shi H, Zhang H, Meng L, Fan M, Han C, Zhang K, Ming F, Xie X, Liu H, Liu J, Lin R, Hou X..
Gastroenterologist-Level Identification of Small-Bowel Diseases and Normal Variants by Capsule Endoscopy Using a Deep-Learning Model. Gastroenterology 2019; 157 (04) 1044-1054.e5 10.1053/j.gastro.2019.06.025. Epub 2019 Jun 25PMID: 31251929