



RESEARCH TOPIC CL14

Organ Saving Strategy for Endoscopic Resection of early colorectal cancer driven by AI (OSSERVA project)

Research Area

Medical Area

Clinical Unit name

Department of Gastroenterology and Digestive Endoscopy

Supervisor

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Abstract

Background Screening programmes have increased the detection of early ColoRectal Cancer. Early CRC can be managed by endoscopy. Determining the potential for curative endoscopic resection relies solely on the expertise of the endoscopist

Hypothesis AI-assisted examination of lesions can increase the number of CRCs amenable to endoscopic resection, thereby reducing the incidence of unnecessary surgery

Aims Developping a real-time AI algorithm capable of stratifying the risk of LNM and SMICC in CRC, facilitating in vivo identification of

endoscopically resectable lesions Experimental design The study will involve a retrospective collection of histological specimens and a prospective collection and annotation of endoscopic videos focusing on early stage CRC. An RCT will then be conducted to assess whether new AI-assisted colonoscopy can reduce the rate of unnecessary surgery

Expected outcomes 25% reduction in unnecessary surgery in early CRC, AI accuracy (>90%) in predicting resectable lesions.

Scientific references

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4 Cardoso, R. et al. Colorectal cancer incidence, mortality, and stage distribution in European countries in the colorectal cancer screening era: an international population-based study. Lancet Oncol 22, 1002–1013 (2021).

5 Hassan, C. et al. Real-Time Computer-Aided Detection of Colorectal Neoplasia During Colonoscopy. <https://doi.org/10.7326/M22-3678> 176, 1209–1220 (2023).

6 Djinbachian, R. et al. Autonomous Artificial Intelligence versus AI Assisted Human optical diagnosis of colorectal polyps: A randomized controlled trial. *Gastroenterology* 0, (2024).

7 Backes, Y. et al. Multicentre prospective evaluation of real-time optical diagnosis of T1 colorectal cancer in large non-pedunculated colorectal polyps using narrow band imaging (the OPTICAL study). *Gut* 68, 271–279 (2019).

8 Li, J. W. et al. Use of artificial intelligence in the management of T1 colorectal cancer: a new tool in the arsenal or is deep learning out of its depth? *Clin Endosc* 57, 24–35 (2023).

9 Nemoto, D. et al. Computer-aided diagnosis of early-stage colorectal cancer using nonmagnified endoscopic white-light images (with videos). *Gastrointest Endosc* 98, 90-99.e4 (2023).

10 Lu, Z. et al. Real-time automated diagnosis of colorectal cancer invasion depth using a deep learning model with multimodal data (with video). *Gastrointest Endosc* 95, 1186-1194.e3 (2022).

Type of contract

Contract for continuative and coordinated service of at least € 26.000 activated Istituto Clinico Humanitas. This sum is subject to IRPEF income tax.

Contratto collaborazione coordinata e continuativa (cococo) pari ad almeno € 26.000 annui lordi attivato da Istituto Clinico Humanitas. Importo soggetto a tassazione IRPEF.