Article published online: 2022-12-13

Virtual scale endoscope-assisted wide-field resection of large sessile serrated lesions

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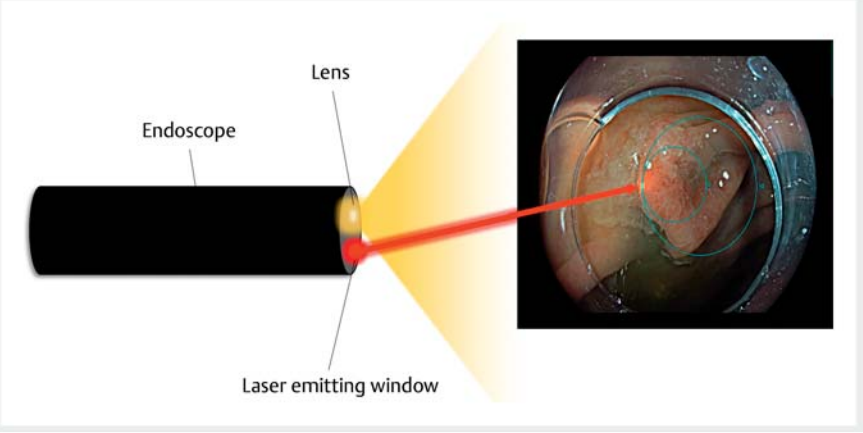
Large sessile serrated lesions (SSLs) are associated with a very high risk of incomplete resection. The CARE study found almost 50 % incomplete resections among 10 to 20-mm SSLs [1]. Wide-field cold snare resection with submucosal injection (cap-assisted endoscopic mucosal resection, C-EMR) has been proposed as an effective method to prevent incomplete resection since distinguishing SSL margins during resection is difficult [2–4]. In contrast to a hot snare, a more extended resection field is recommended for a cold snare [5]. However, quantification of the resection field extent in comparison to polyp size has been challenging in the past. The novel virtual scale endoscope (VSE; SCALE EYE, Fujifilm, Tokyo, Japan) can be used as dedicated technology to measure polyp size before resection and to ensure adequate post-resection defect size. The VSE allows polyp size measurement during live colonoscopies by emitting a laser beam onto the mucosa to measure distance. This permits superimposition of a linear/circular ruler that changes in size depending on distance of the endoscope to the laser point (▶ **Fig. 1**).

We present VSE-assisted C-EMR for two large SSLs (▶ **Video 1**). The polyps were assessed with the VSE before and after submucosal injection and resection to ensure adequate wide-field resection. SSLs were initially measured using the VSE and assessed using computer-aided diagnosis (CADx) to determine their size (> 10 mm) and ensure that C-EMR was the adequate approach. Then the extent of wide-field resection was planned and controlled using the VSE. For resection, submucosal injection was used to allow better exposure of the entire polyp and obtain a pre-resection measurement using the VSE (▶ **Fig. 2**). The polyps were then resected, and an artificial-intelligence system (CADx) was used to detect polyp remnants at the margins during C-EMR (▶ **Fig. 3**). The resection extent was adjusted based on CADx and VSE information to ensure adequate and complete wide-field resection. The final resection defect size was measured to ensure that it was significantly larger than the pre-resection polyp size after submucosal injection (▶ **Fig. 4**).



▶ **Fig. 1** Virtual scale endoscope with laser point on polyp from which a scale is projected on the endoscopy screen.

Video 1 Virtual scale endoscope-assisted resection of two large sessile serrated polyps with pre-resection measurement of the polyps and post-resection measurement of the resulting defect for wide field margins.

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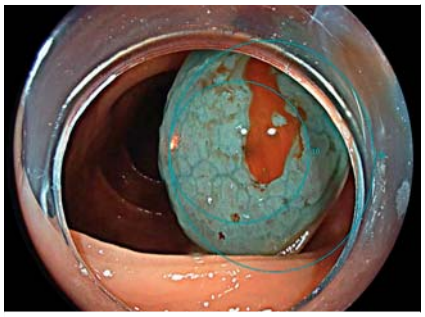
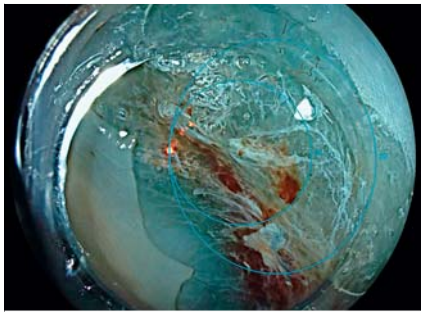


▶ **Fig. 2** Post-submucosal injection size measurement with virtual scale endoscope for polyp 1.

▶ **Fig. 3** Computer-aided diagnosis of polyp remnant.



▶ **Fig. 4** Resection defect size measurement for polyp 1.

Competing interests

Daniel von Renteln is supported by a "Fonds de Recherche du Québec Santé" career development award. He has also received research funding from ERBE Elektromedizin GmbH, Ventage, Pendopharm, Fujifilm and Pentax, and has received consultant or speaker fees from Boston Scientific Inc., ERBE Elektromedizin GmbH, and Pendopharm. Roupen Djinbachian declares that they have no conflict of interest.

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Endoscopy 2023; 55: E314–E315
DOI 10.1055/a-1981-2392
ISSN 0013-726X
published online 13.12.2022

Georg Thieme Verlag KG, Rüdigerstraße 14, 70469 Stuttgart, Germany