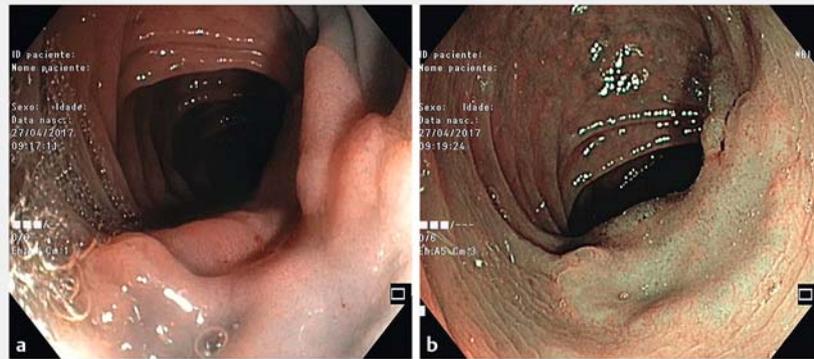
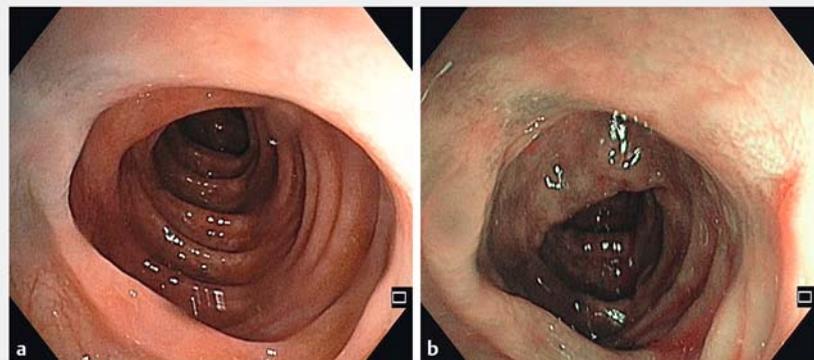


## Underwater endoscopic mucosal resection of a laterally spreading tumor overlying a previous endoscopic carbon tattoo



► **Fig. 1** On the descending colon, a 40-mm nongranular, homogeneous, laterally spreading tumor (LST) was identified, overlying a previously placed carbon tattoo. **a** White-light imaging. **b** Narrow-band imaging.



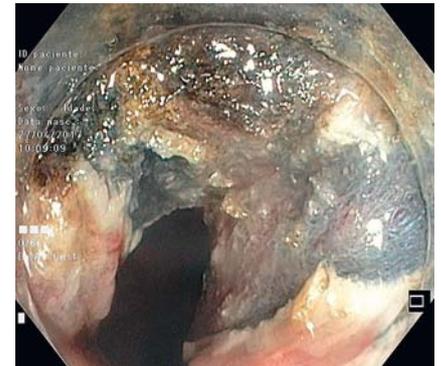
► **Fig. 3** Surveillance colonoscopy 3 months later showed the scar with no signs of recurrence. **a** White-light imaging. **b** Narrow-band imaging.

A 53-year-old man with no relevant past medical history was referred to our department for resection of a laterally spreading tumor (LST) on the descending colon, which had been tattooed previously.

The procedure was performed with a transparent cap attached to the tip of the colonoscope (Q185; Olympus Medical Systems, Tokyo, Japan), with the patient under deep propofol sedation. A 40-mm nongranular, homogeneous LST was identified, overlying a previously placed carbon tattoo (► **Fig. 1**), with re-

sulting severe fibrosis that precluded elevation for conventional endoscopic mucosal resection (EMR). Therefore, underwater piecemeal EMR was performed, after marking the lesion limits with snare tip coagulation (► **Video 1**). Complete resection was achieved without complications. The procedure exposed involvement of almost all of the submucosa by the ink (► **Fig. 2**). The patient was discharged on the same day.

Histopathological analysis revealed a tubular adenoma with low grade dysplasia, and with carbon pigment in the mar-

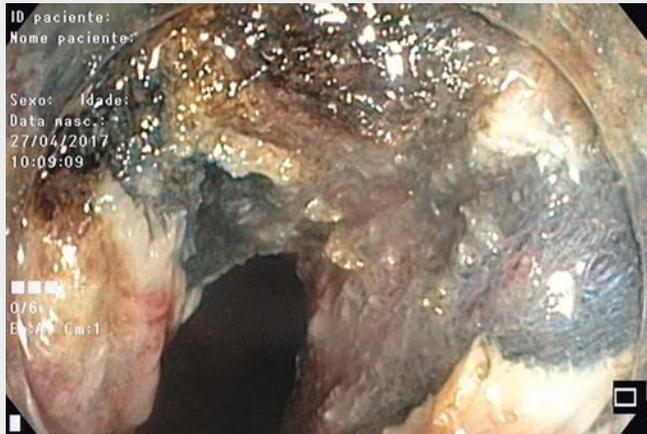


► **Fig. 2** Endoscopic image showing the involvement of almost all of the submucosa beneath the scar by the carbon ink.

gins of most fragments. On surveillance colonoscopy 3 months later, the scar had no endoscopic or histological recurrence (► **Fig. 3**).

Endoscopic tattooing is a widely used technique to facilitate the identification of colorectal lesions for subsequent endoscopic or surgical treatments [1,2]. However, tattooing has been associated with clinically significant complications, including peritonitis [1,2]. Additionally, tattooing under a lesion can result in technical difficulties because of associated submucosal fibrosis, which makes endoscopic resection procedures hazardous and has contributed to perforation [1–3]. In fact, carbon particles can spread across a significant distance within the submucosal plane; it is therefore recommended that tattoos are placed 2–3 cm anatomically distal to the lesion [1,2]. Underwater EMR has been shown to be a useful technique for lesions that are difficult to resect, including those associated with fibrosis [4,5]. In the present report, we present the first case of a successful underwater EMR of a lesion associated with fibrosis secondary to tattoo.

Endoscopy\_UCTN\_Code\_CPL\_1AJ\_2AD



**Video 1** Underwater piecemeal endoscopic mucosal resection of a laterally spreading tumor overlying a previous endoscopic carbon tattoo with associated severe fibrosis.

### Bibliography

DOI <https://doi.org/10.1055/a-0624-1362>

Published online: 19.6.2018

Endoscopy 2018; 50: E231–E232

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Stuttgart · New York

ISSN 0013-726X

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### Competing interests

None

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