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To lift or not to lift? That is the question

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Bibliography
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In 1994 Uno et al. [1] first described the "non-lifting sign", a simple and cheap method for recognizing lesions which can be resected endoscopically. The authors concluded that if a lesion could be lifted with submucosal saline, it was almost certain that it was not an invasive cancer. Conversely, the non-lifting sign had a positive predictive value of 83 % for the lesion being an invasive cancer. The method was widely adopted because the technique was simple and because no expensive equipment was required.

Five years later, the same group reported a more detailed analysis of the correlation between depth of submucosal invasion and lifting [2]: it appeared that most cancers that were invading less than 1000 µm into the submucosa would also lift; lesions invading more deeply were likely to exhibit the non-lifting sign (see **Table 1**, [2–4]). This was fortuitous because lesions limited to the top third of the submucosa are associated with an insignificant risk of metastasis (< 1 %), while lesions that are invading more deeply than this are associated with a 10 % overall risk of metastasis [5].

However, it was recognized that some cancers could be made to lift, albeit reluctantly, if a sufficient amount of saline was forced into the submucosa. Kato et al. [3] described three degrees of lifting: (a) easy, symmetrical lifting of a soft and pliable lesion; (b) lifting, but with the lesion appearing firm and rigid on top of the saline cushion; and (c) poor lifting, with most of the submucosal saline shifting to the sides of the lesion rather than below the lesion (**Fig. 1**). Lesions that lifted easily were all confined to the mucosa or superficial submucosa. Lesions that lifted incompletely were likely to be invasive cancers that were invading too deeply for endoscopic removal.

In this issue of *Endoscopy* research from the National Cancer Center in Tokyo challenges this conclusion. Kobayashi et al. [4] describe how 10/26 lesions that were invading more deeply than 1000 µm could be made to lift and conclude that relying on the non-lifting sign alone might be inadequate.

However, on closer scrutiny their data are more reassuring. Of their 10 invasive cancers that lifted "inappropriately", endoscopic resection was nevertheless successfully carried out in four cases. Their true risk of inappropriate lifting therefore appears to be closer to 6/26. Although the authors did not report on the ease with which lesions lifted, I presume that the lifting was not completely "free and symmetrical" (as described by Kato et al. [3]) in some of the invasive cancers that lifted inappropriately. Finally, as nine of the 10 lesions with a false-negative non-lifting sign were elevated with glycerol rather than saline, it appears that we should be cautious in interpreting lifting when a thick, viscous fluid such as glycerol is being used for the submucosal injection.

The main conclusion reached by the authors is that the non-lifting sign should not be interpreted in isolation. The endoscopic appearance of lesions, including their rigidity, tethering, or sudden alterations in growth pattern (demarcated depressions or nodules) are all important for recognizing an early colorectal cancer.

A conclusion common to all these four studies is that lesions that have been sampled previously cannot be assessed for non-lifting because of submucosal scarring [6]. Similarly, lesions arising on a background of colitis are difficult to lift. Early hopes that this could be a another use for endoscopic ultrasound have not been fulfilled as the inflammatory reaction that is causing the non-lifting sign would also blur the normal colonic wall layers [7].

In your endoscopic practice you might reflect on the likely consequences of getting the non-lifting sign wrong. When endoscopically under-staging an early colonic cancer, you are likely to struggle

Authors [ref. no.]	Year	Adenoma	sm1 cancer (≤ 1000 μm)	sm2 cancer (1000 – 2000 μm)	sm3 cancer (> 2000 μm)
Uno & Munakata [1]	1994	2/195	–	–	–
Ishiguro et al. [2]	1999	–	2/31	7/23	6/6
Kato et al. [3]	2001	0/72	0/12	6/11	8/11
Kobayashi et al. [4]	2007	4/245	–	16/26	–

Table 1 The number of lesions that exhibited the non-lifting sign according to lesion type (invasion depth)

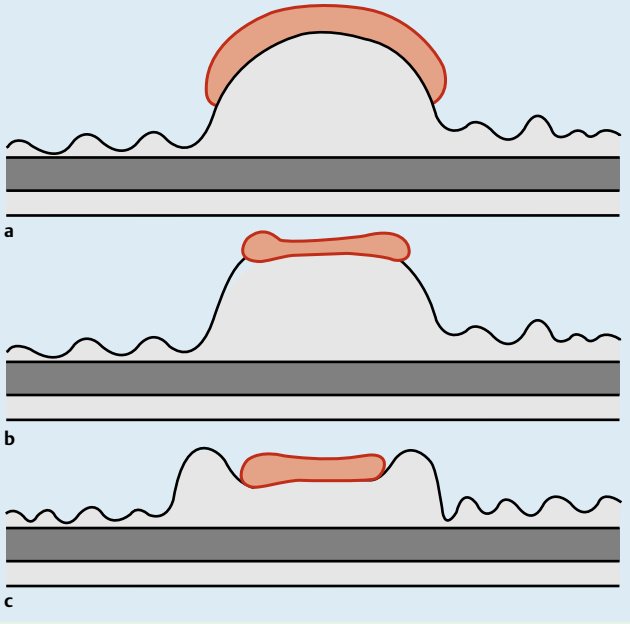

Fig. 1 Degrees of lifting. **a** Easy, symmetrical lifting of a soft and pliable lesion. **b** Lifting, but with the lesion appearing firm and rigid on top of the saline cushion. **c** Poor lifting, with most of the submucosal saline shifting to the sides of the lesion rather than below the lesion. (Reproduced from the study by Kato et al. [3].)

with the mucosectomy and end up with malignant cells at the deep resection margin. You can then more confidently advise your patient that a colectomy is indicated. The consequences of endoscopic over-staging are more significant, however. Erroneously labeling an adenoma as a deeply invasive cancer will mean that an elderly patient could be subjected to the hazards of an unnecessary colectomy, which, even in the best centers, will kill at least one in 20 patients [8].

Competing interests: None

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