Standard forward-viewing colonoscopy versus full-spectrum endoscopy: an international, multicentre, randomised, tandem colonoscopy trial

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Summary

Background
Although colonoscopy is the accepted standard for detection of colorectal adenomas and cancers, many adenomas and some cancers are missed. To avoid interval colorectal cancer, the adenoma miss rate of colonoscopy needs to be reduced by improvement of colonoscopy technique and imaging capability. We aimed to compare the adenoma miss rates of full-spectrum endoscopy colonoscopy with those of standard forward-viewing colonoscopy.

Methods
We did an international, multicentre, randomised trial at three sites in Israel, one site in the Netherlands, and two sites in the USA between Feb 1, 2012, and March 31, 2013. Patients aged 18—70 years referred for colorectal cancer screening, polyp surveillance, or diagnostic assessment underwent same-day, back-to-back tandem colonoscopy with standard forward-viewing colonoscope and the full-spectrum endoscopy colonoscope. The patients were randomly assigned (1:1), via computer-generated randomisation with block size of 20, to which procedure was done first. The endoscopist was masked to group allocation until immediately before the start of colonoscopy examinations; patients were not masked. The primary endpoint was adenoma miss rates. We did per-protocol analyses. This trial is registered with ClinicalTrials.gov, number NCT01549535.

Findings
197 participants were enrolled. 185 participants were included in the per-protocol analyses: 88 (48%) were randomly assigned to receive standard forward-viewing colonoscopy first, and 97 (52%) to receive full-spectrum endoscopy colonoscopy first. By per-lesion analysis, the adenoma miss rate was significantly lower in patients in the full-spectrum endoscopy group than in those in the standard forward-viewing procedure group: five (7%) of 67 vs 20 (41%) of 49 adenomas were missed (p<0·0001). Standard forward-viewing colonoscopy missed 20 adenomas in 15 patients; of those, three (15%) were advanced adenomas. Full-spectrum endoscopy missed five adenomas in five patients in whom an adenoma had already been detected with first-pass standard forward-viewing colonoscopy; none of these missed adenomas were advanced. One patient was admitted to hospital for colitis detected at colonoscopy, whereas five minor adverse events were reported including vomiting, diarrhoea, cystitis, gastroenteritis, and bleeding.

Interpretation
Full-spectrum endoscopy represents a technology advancement for colonoscopy and could improve the efficacy of colorectal cancer screening and surveillance.

Funding
EndoChoice.