# Position change during colonoscope withdrawal increases polyp and adenoma detection in the right but not in the left side of the colon: results of a randomized controlled trial

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**Background:** It has been suggested that changing patient position during colonoscope withdrawal increases adenoma detection. The results of previous studies have been conflicting.

**Objective:** To evaluate whether routine position change during colonoscope withdrawal improves polyp detection.

**Design:** Randomized, 2-way, crossover study.

**Setting:** Teaching hospital.

**Patients:** A total of 130 patients attending for diagnostic colonoscopy.

**Interventions:** Patients undergoing colonoscopy had each colon segment examined twice: the right side of the colon (cecum to hepatic flexure) in the supine and left lateral position and the left side of the colon (splenic flexure and descending colon) in the supine and right lateral position. The transverse colon was examined twice in the supine position.

**Main Outcome Measurements:** The primary outcome measure was the polyp detection rate ($\geq 1$ polyp) per colon segment. Secondary outcome measures included the number and proportion of patients with $\geq 1$ adenoma in each segment and adequacy of luminal distension (1 = total collapse and 5 = no collapse).

**Results:** Examination of the right side of the colon in the left lateral position significantly improved polyp detection (26.2% vs 17.7%; $P = .01$) and luminal distension (mean = 4.0 vs 3.5; $P < .0001$). Position change did not improve polyp detection in the left side of the colon (5.4% vs 4.6%; $P = .99$). There was no significant correlation between luminal distension and polyp detection in the right side of the colon ($r = .03$).

**Limitations:** Single center and open study design.

**Conclusion:** Examining the right side of the colon in the left lateral position increased polyp detection compared with examination in the supine position. Polyp detection in the left side of the colon was similar in the right lateral and supine positions. (Clinical trial registration number: NCT01554098.) (Gastrointest Endosc 2015;82:488-94.)

Colorectal cancer (CRC) is one of the commonest causes of cancer-related death in Western countries.[1] A number of studies have shown that CRC-associated mortality is significantly reduced by the colonoscopic removal of polyps.[2,3] However, not all polyps are identified during colonoscopy, and miss rates of 17% to 28% have been reported.[4-7] This is important because the risk of interval CRC after colonoscopy is inversely associated with the adenoma detection rate of the colonoscopist.[8,9]

The factors that determine polyp detection are complex, but colonoscope withdrawal time, inspection behind colon folds, adequate luminal distension, and cleaning of residual debris have been highlighted as important determinants.[10,11] In addition, it has been suggested that

*Abbreviation: CRC, colorectal cancer.*

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changing the position of the patient during colonoscope withdrawal may improve polyp detection.

Traditionally, after insertion of the colonoscope, the instrument was most often withdrawn and the colon examined with patients in a single position (usually left lateral or supine). However, positioning patients such that the colon segment being examined is uppermost in the abdomen (right side of the colon in the left lateral position, the transverse while supine and the splenic flexure and descending colon in the right lateral position) improves luminal distension and may increase polyp detection. The merits of this strategy have been assessed in several recent studies, but the results are conflicting.[12-15]

East et al[13] were the first to report that position change improved polyp detection but the benefit was only apparent in the transverse colon. Similar results were reported by Köksal et al,[14] but the largest and most recent study has reported negative results.[15] Given these conflicting results, we have re-examined the benefits of position change during colonoscope withdrawal.

## METHODS

Patients aged 40 to 80 years presenting for a diagnostic colonoscopy at the Northern General Hospital, Sheffield, between March 2012 and February 2014 were invited to participate. Patients with limited mobility, those who had previously undergone colon surgery, or those known to have colitis or a polyposis syndrome were excluded. Patients with a permanent pacemaker also were excluded, because this would preclude the use of the Scopeguide (Olympus, Tokyo, Japan). All patients gave written informed consent, and the study was approved by the local National Health Service Research Ethics Committee and registered on clinicaltrials.gov (NCT01554098).

### Colonoscopy examination

All patients underwent bowel preparation with 4 L of polyethylene glycol solution. Examinations were performed by 4 experienced colonoscopists by using variable stiffness colonoscopes (CF-Q260; Olympus, Tokyo, Japan).

In order to standardize the beginning and end of each colon segment, two pinch biopsies were taken at the sigmoid-descending junction, the splenic flexure, and the hepatic flexure, thereby defining the left side of the colon (splenic flexure and descending colon but not including the sigmoid colon), the transverse colon, and the right side of the colon (cecum, ascending colon, and hepatic flexure) (Fig. 1). The location of the pinch biopsies was determined by the endoscopic appearances and the configuration of the colonoscope on the Scopeguide imager.

During colonoscope insertion, endoscopists were instructed to change the patient position as required. All polyps seen on insertion were removed or marked for later removal. These polyps were not included in the analysis. Patients in whom colonoscope insertion took longer than 20 minutes were excluded before randomization.

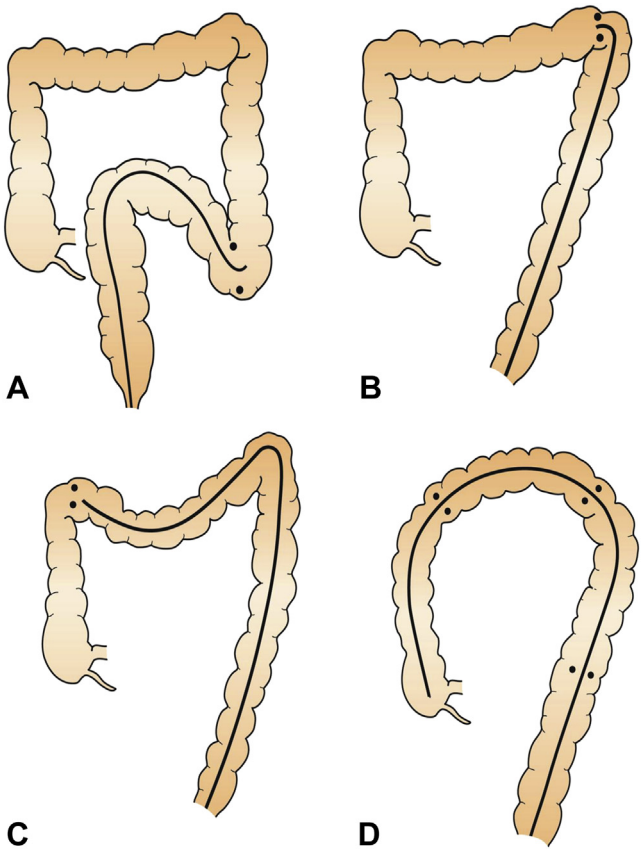


**Figure 1.** Characteristic configuration of the Scopeguide image (*solid line*) during insertion (**A, B,** and **C**) facilitated placement of pairs of mucosal pinch biopsies to define colon segments during colonoscope withdrawal (**D**).

During colonoscope withdrawal, each colon segment was examined twice. After cecal intubation, patients were randomized, in a 1:1 ratio, to undergo colonoscopic withdrawal in either the supine position followed by position change or vice versa. The position change was left lateral position for examination of the right side of the colon and right lateral position for examination of the left side of the colon. The transverse colon was examined twice in the supine position to assess the incremental benefit of a repeat examination in the same position. The order in which segments were to be examined was generated by www.random.org, stored in an opaque sealed envelope, and revealed only after cecal intubation.

Unless contraindicated, patients were given 20 mg hyoscine butylbromide intravenously after cecal intubation, and further doses were administered at the discretion of the endoscopist. Each colon segment was examined for a minimum of 2 minutes, during which attempts were made to maximize mucosal visualization by insufflating air, cleansing, and inspection behind mucosal folds. After the first inspection, the colonoscope was reinserted, and