

Minimal water exchange colonoscopy

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Conventional colonoscopy uses air to inflate the lumen. However, excessive air may lengthen the bowel, cause angulations and loop formation, and increase patients'

discomfort. Although carbon dioxide may be superior to room air,¹ it is not always available, and unintentional insufflation still occurs during the procedure.

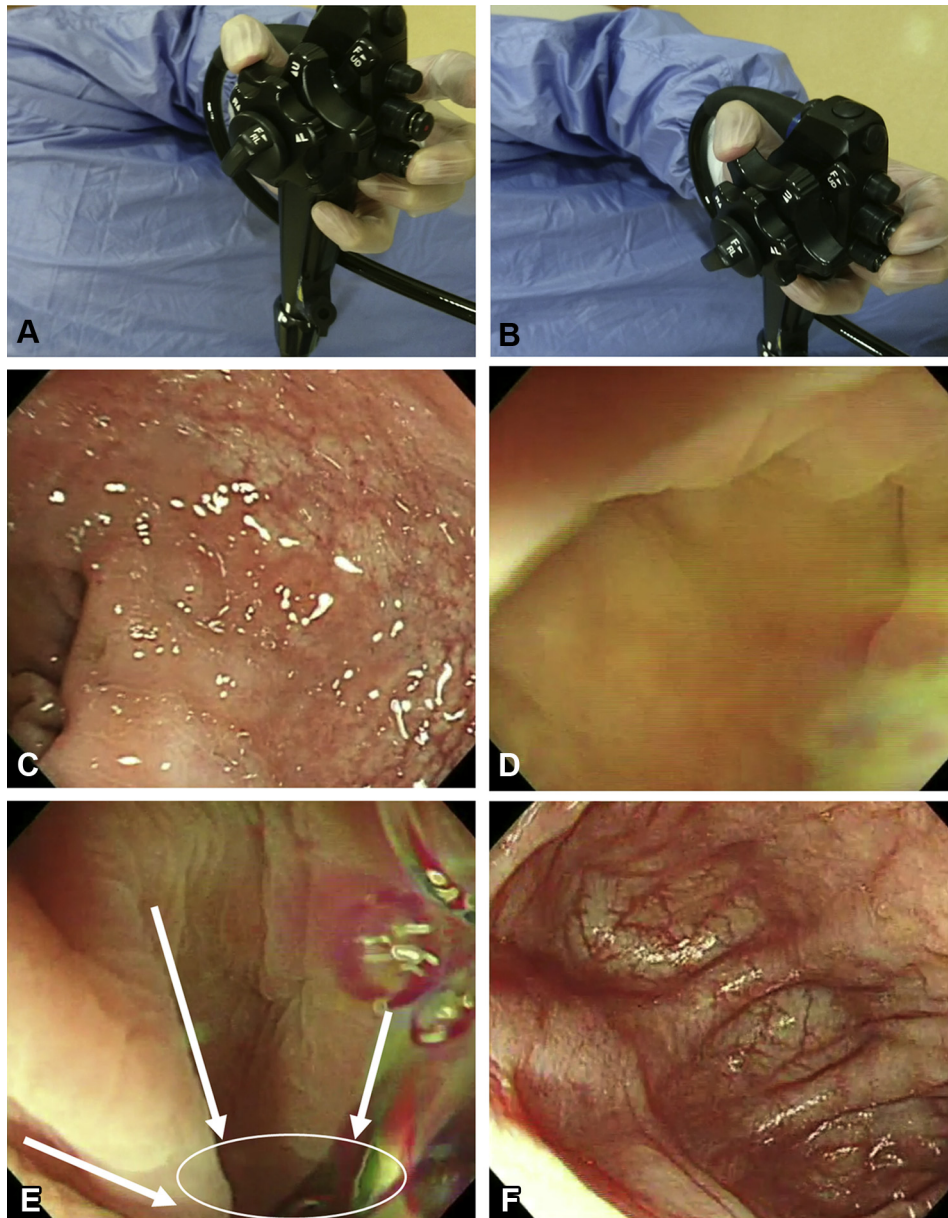


Figure 1. **A**, Air-water valve button is pressed firmly to insufflate water. **B**, Suction is applied without releasing the water valve button. **C**, At rectum, lumen is deflated and water insuflation is started. **D**, Typical view in underwater colonoscopy. **E**, The “radiated fold convergence” or dark area generally indicates the next direction to advance. **F**, When the proximal part of the colon is reached, water insuflation can be stopped while the colonoscope is advanced with minimal air as possible.

The water exchange method, by deflating the lumen with air suction and then infusing water, has the advantage of causing less pain and reducing the need for narcotics, as shown in several clinical trials.^{1,2} However, an irrigation pump is necessary for this procedure, and it is somewhat time-consuming owing to repeated deflation, irrigation, and suction in every segment of the entire colon.

Here we introduce a new technique, minimal water exchange (MWE), which shares the concept of the original version of the water exchange method but adds the infusion of modest amounts of water by constant pressure on the air-water valve button of the endoscope (Figs. 1A and B). In the video (Video 1, available online at www.VideoGIE.org), we demonstrate this method in a 40-year-old healthy man who underwent screening colonoscopy.

At the rectum, we deflated the lumen by suction and then started water insufflation. Because the lumen is minimally inflated, gentle skill is important; several physical signs are helpful to find the best direction for suction (Figs. 1C, D, and E).

Bubbles and stool residuals may impair visualization. With this technique, we do not add simethicone to the water because the fluid would thereby become turbid and interfere with visibility. Bubbles can be easily eliminated by sucking air and gently infusing water. When the bowel preparation is suboptimal, repeated suction and insufflation are usually adequate.

After the proximal part of the colon is reached by recognition of the triangular appearance, water insufflation can be stopped for the remainder of the procedure. Just as in conventional air colonoscopy, abdominal compression or change of position can be used to overcome difficult situations as necessary (Fig. 1F).

Compared with the water immersion method, which only infuses water without deflating the lumen,^{3,4} elimination of air pockets in MWE further reduces lumen distension and loop formation. On the left side of the colon, MWE is similar to the conventional water exchange method without the need of a water pump, and faster intubation is achieved because limited air can be used from the transverse colon. On the other hand, the benefit of right-side colon cleansing may be theoretically less evident in MWE. To maximize adenoma detection, we perform meticulous technique during withdrawal phase, although it may be done during intubation if visibility is poor.

The indications for and contraindications to MWE are almost the same as for conventional colonoscopy, inasmuch as they differ only in intubation techniques.

However, MWE may be more difficult and time-consuming in the poorly prepared colon because excessive residue may severely impair the visual fields, especially if they are impossible to clear by suction. Similarly, if massive and ongoing bleeding is expected, air colonoscopy may be a better choice in the presence of many blood clots.

In MWE, adverse events are similar to those of conventional air colonoscopy. An experienced colonoscopist may find MWE safer because the procedure facilitates easier passage to acute angles or segments with numerous diverticula. For a trainee who is not familiar with basic intubation skills, avoidance of blind advancement and gentle pushing only with free sensation of the insertion tube are key points to avoid adverse events.

In summary, the MWE method is easy, fast, and convenient while preserving the advantages of water colonoscopy. It is especially helpful in units without water pumps.

DISCLOSURE

All authors disclosed no financial relationships relevant to this publication.

Abbreviation: MWE, minimal water exchange.

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