Water-Aided Colonoscopy

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KEYWORDS

• Colonoscopy • Water immersion • Water infusion • Adenoma detection • Sedation

KEY POINTS

- Water-assisted colonoscopy involves the infusion of water without air and subsequent suctioning during insertion (exchange) or withdrawal (immersion or infusion).
- Water-assisted colonoscopy can be used to decrease sedation requirements in patients undergoing colonoscopy.
- Water-assisted colonoscopy can increase completion rate in examinations not using sedation.
- Water-assisted colonoscopy can be used to complete difficult examinations owing to redundancy or severe angulation in the distal colon.
- Water-assisted colonoscopy may yield more proximal adenomas than air insufflation for some operators, perhaps due to longer withdrawal/examination time and bowel preparation salvaging.
- Water exchange may be superior to water immersion with regards to pain experience by patients.
- Water infusion has been shown to not deleteriously alter serum electrolyte levels or vital signs.

INTRODUCTION

Colorectal cancer prevention with colonoscopy depends on the successful insertion of the colonoscope to the cecum with subsequent careful mucosal inspection on withdrawal. The recommended target for an endoscopist's cecal intubation rate is 90% for all examinations and 95% for healthy screening patients.[1,2] Thus, a significant number of colonoscopies may still be incomplete. In addition, colonoscope insertion, even in those examinations with ultimately successful cecal intubation, can still be associated with many challenges. Previous investigators have observed that

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predictors such as female gender and thin body habitus may be associated with difficult or incomplete examinations.[3,4] There have been attempts to produce new scopes that may aid in the completion of colonoscopies.[5] In addition, new techniques such as water-aided colonoscopy have been developed.

The infusion of water during colonoscopy has been used in an attempt to allow easier insertion of the scope. One of the initial studies involved the use of 100 to 200 mL of sterile water to facilitate the passage of the colonoscope through the left colon.[6] The investigators observed that water infusion in the left colon reduced insertion time by nearly one-third as compared with the traditional insertion method. Since that publication, several studies have examined the utility of water infusion as well as water exchange. This review provides insight into the rationale and utility of water-assisted colonoscopy and highlights important clinical studies.

DIFFICULT COLONOSCOPIES

When assessing the efficacy of any modality designed to assist the endoscopist during colonoscope insertion, the clinically important outcomes and benchmarks need to be identified. Thus, it is important to examine how difficulty in colonoscopy insertion can be defined, measured, and characterized. The most important outcome for colonoscopy is completion of the examination as defined by successful cecal intubation. Because this rate is often greater than 95%, other important measures may be considered. Despite the potential for gaming, time to the cecum or insertion time has been used to determine the difficulty of colonoscopy.[3] Other measures may include the ability to retroflex in the cecum, which can often be a manifestation of redundancy or looping of the scope,[5] and the need for maneuvers such as abdominal pressure, stiffening of the colonoscope, and changing the position of the patient. These measures likely reflect the degree to which the colonoscope is looping in the patient. The ability to perform endoscopy without sedation or the amount of sedation medication required may also be considered relevant measures. Finally, the patient's experience, often reported as pain during or after the examination, is also an important outcome. Except for cecal intubation, these measures are subjective, and thus the results of studies based exclusively on them may be difficult to interpret.

Adequate discussion of difficult insertion requires understanding the underlying mechanisms. Difficult insertion is often related to the anatomic location of the colonoscope tip when the challenge is encountered and can be categorized into challenges that are distal or in the sigmoid and those that are related to redundancy or persistent looping.[7] Sigmoid challenges might be observed in patients with severe angulation, such as thin women or patients with diverticular disease.[3,4] Issues related to redundancy or excessive looping may be seen in patients with central obesity or severe constipation.[3]

RATIONALE FOR USE OF WATER-ASSISTED COLONOSCOPY

There are several proposed mechanisms through which water may facilitate the passage of a colonoscope through the colon. When filled with water, the sigmoid colon may be weighted down into the left lower quadrant if the patient is in the left lateral decubitus position. This can straighten the sigmoid and make tight angles less acute. Another mechanism may be related to the shortening of the colon through the use of water as opposed to air, which may elongate the colon.[8] In addition, the use of water may help to lubricate the scope, allowing for easier passage. Other proposed mechanisms include decreased colonic spasm.