Water-aided Colonoscopy

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KEYWORDS

• Colonoscopy • Water-aided method • Discomfort • Pain • Adenoma detection rate • Water immersion • Water exchange

KEY POINTS

- Water immersion and water exchange are characterized by removal of the infused water predominantly during withdrawal and insertion, respectively.
- Randomized controlled trial data suggest that water exchange may be superior to water immersion in minimizing insertion pain and optimizing adenoma detection, particularly in the proximal colon.
- Although simple, the novel techniques of water exchange require practice to master all of the maneuvers.

INTRODUCTION

Water-aided methods for colonoscopy have received renewed attention in the literature in recent years. There are 2 major categories, namely water immersion and water exchange. Water immersion was described in the English-language literature in 1984 as an adjunct to air insufflation to aid insertion.[1] The method was characterized by suction removal of the infused water during the withdrawal phase of colonoscopy. Water exchange is a recent modification of water immersion, first reported in 2007.[2] Water exchange is advocated currently as the sole modality to use air exclusion to aid insertion and is characterized by suction removal of the infused water, predominantly during the insertion phase of colonoscopy. The water method studies that did not show an advantage for water compared with air used primarily water immersion rather than water exchange.[3,4] The current article is intended to clarify these nuances by providing a description of the two major water-aided methods. Reference is made to studies other than randomized controlled trials (RCTs) to provide a

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historical perspective. A comparison of recent RCTs of water-aided methods and traditional air insufflations is presented to support the possibility that one approach (water exchange) may be superior to the other (water immersion) in minimizing pain and optimizing adenoma detection. The comparative data call for further head-to-head RCTs to assess air insufflations, water immersion, and water exchange.

HISTORICAL PERSPECTIVE

Pioneer colonoscopists used air insufflations to distend the colonic lumen in unsedated patients. Despite traditional maneuvers of loop reduction, patient position change, and abdominal compression to minimize pain, these early colonoscopic examinations were associated with unavoidable discomfort. Sedation was introduced to increase patient tolerance and soon became the standard of practice in the United States and elsewhere. Cleaning of the mucosal surface for inspection involved boluses of water injected by a syringe through the biopsy channel. In 1984, water immersion was described as an adjunct to conventional air insufflations to facilitate passage through the sigmoid colon affected by severe diverticulosis.[1] Water immersion was reported to speed up passage through the left colon.[5] Use of warm water to counter spasm was described as simple, inexpensive, and effective.[6] Water immersion is characterized by removal of the infused water predominantly during the withdrawal phase of the colonoscopy.

In 2002, a nursing shortage curtailed the ability to routinely offer conscious sedation for colonoscopy at the author's institution. After a search of the literature, unsedated colonoscopy was offered to restore local access.[7] When the pros and cons of sedation versus no sedation were presented, about 30% of veterans accepted the scheduled unsedated option, primarily because of lack of escorts.[7,8] Using the same method as was used in sedated patients, the success rate of cecal intubation was only about 80%,[7–10] but comparable with the best reports on unsedated colonoscopy of the time.[11]

The limiting factor during insertion was pain brought on by lengthening of the colon caused by the insufflated air needed to expand the lumen for visualization, preventing cecal intubation in ~20% of the unsedated patients.[7–10] To complete the failed cases without sedation, the first clinical research question was whether cecal intubation could be accomplished without the use of air insufflations. Of all the modalities for reducing colonoscopy discomfort,[12] water immersion as an adjunct to conventional air insufflations seemed to be the most promising.[13] Subsequent work focused on whether cecal intubation with water infusion in lieu of air insufflations (water exchange) could be accomplished.[2,10] The results of a series of observational studies[2,10,14] and RCTs[15–17] confirmed the feasibility of water exchange to aid insertion and accomplish cecal intubation.

METHODOLOGICAL DETAILS OF WATER-AIDED METHODS

Water immersion used as an adjunct to conventional air insufflations does not require the acquisition of new skills or the use of new maneuvers. It entails distention of the colon by water that is removed predominantly during withdrawal,[1,5,6] but the method has varied in the literature. The water is infused by syringe or water pump through the biopsy channel. One RCT reported less colonic spasm by the use of warm-to-touch water[6]; however, a recent RCT showed no difference between warm water (35°–38°C) and cool water (20°–23°C) with regard to sedation requirement, pain or satisfaction scores, or cecal intubation times.[18] Other descriptions permitted insufflation of puffs of air as needed[4] or when water immersion was deemed a failure based on