Colonic Irrigation Solution

An efficacious, convenient, and easily tolerated method for improving polyp detection during routine colonoscopy procedures.

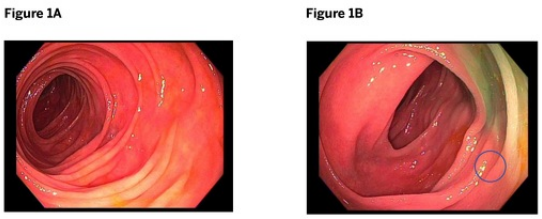

Figure 1. Comparison of colonic mucosa visualization with and without the novel irrigation solution. Figure 1A is an image obtained during a colonoscopy using the standard saline irrigation solution. Figure 1B is an image of the same colon using the novel irrigation solution. A polyp can be seen in the lower right hand corner, as indicated by the blue circle.

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Category

Life Sciences/Imaging

Life Sciences/Diagnostics

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Technology

Dr. Pochapin has developed a novel aqueous solution for irrigating the colon during colonoscopy procedures for improved polyp detection. This clear solution comprises i) an indigo, blue, or green colored contrast dye; ii) a surfactant, specifically polydimethylsiloxane (e.g., simethicone); and iii) a muscle relaxant (e.g., peppermint oil), with water or saline as the solvent. The contrast agent enables enhanced detection of potentially pre-cancerous adenomatous polyps, resulting in earlier medical intervention and improved quality of colon cancer screening. Additionally, the surfactant significantly reduces any bubble formations that could obscure adequate visualization of the colon mucosal surface. Further, the muscle relaxant reduces colonic spasm, which improves visualization, scope maneuverability, and scope stabilization during the procedure. This innovative solution can be delivered through the working channel of a colonoscope or a dedicated water jet at the tip of the scope. Administration can be intermittent or continuous at the physician's discretion. In a patient's colonoscopy procedure, a composition containing 0.5 ml of 1% methylene blue solution, 30 mg simethicone, and 0.5 ml peppermint oil per liter of saline provided clear visualization of the colonic mucosa and enhanced detection of surface abnormalities, particularly polyps. In all, this colonic irrigation solution is a superior alternative to current saline irrigation solutions for colonoscopies due to its improved detection of mucosal surface abnormalities (e.g. polyps) and highly positive patient satisfaction.

Background

Colorectal cancer is the second most common cause of cancer-related deaths in the United States, with over 150,000 new patients diagnosed with the condition each year. Colonoscopy is

considered the gold standard for colorectal cancer screening by permitting the detection and removal of precancerous polyps. This procedure is recommended annually for individuals over the age of 45, or earlier for those with a family history of colorectal cancer or certain medical conditions (e.g., Inflammatory Bowel Disease). Yet, this procedure suffers from key limitations using the prescribed oral bowel preparations, namely, missed polyps, painful colonic spasms, and overall patient discomfort. Bowel preparation using current methods is suboptimal in 24% of colonoscopies and standard saline irrigation solutions don't address mucosal visualization or patient comfort. Therefore, there is an unmet need for irrigation solutions that enhance mucosal visualization and improve patient tolerance of the procedure.

Applications

The solution can be potentially used in:

- Routine screening colonoscopies
- Diagnostic colonoscopies for suspected colorectal diseases
- Therapeutic colonoscopies (e.g., polypectomy procedures)
- Research tool for studying colonic mucosal patterns and abnormalities with inflammation as seen in Inflammatory Bowel Disease (IBD)

Advantages

- **Improved visualization:** Contrast dye enhances detection of mucosal abnormalities (e.g., precancerous/cancerous polyps) and muscle relaxant reduces colonic spasms for greater scope maneuverability and stability.
- **Reduced bubble interference:** Added surfactant minimizes obscuring bubbles.
- **Compatible with standard equipment:** Solution can be delivered via widely available colonoscopy instrumentation.
- **Easily customizable:** Composition can be tailored based on specific procedural needs.

Development Status

The solution was tested in a colonoscopy procedure with no adverse effects. Further clinical evaluation may be ongoing to optimize the formulation and assess its impact on polyp detection rates and patient experience.

Intellectual Property

NYU holds an issued U.S. non-provisional patent covering the composition of the irrigation solution, its method of use for examining the colonic surface, and a kit for clinical application of the solution with instructions for use.