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IN THE EXPERT'S FOCUS

Grading the Quality of Bowel Preparation ^{☆ ☆}



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Received 22 January 2013; received in revised form 14 May 2013; accepted 22 May 2013

KEYWORDS

Colonoscopy;
Bowel preparation;
Video

Abstract

In colonoscopy, even a complete examination has little diagnostic accuracy when the endoscopic view of the mucosa was impaired by residual stool. Therefore, an assessment of the visibility of the mucosa is important, in order to be able to judge the reliability of positive, but even more importantly, negative findings during colonoscopy.

Insufficient visualization can result in lesions, especially small or flat ones, being missed. Poor bowel preparation may also result in difficult progression, an increased risk of complications, prolonged procedure duration and an increase in the amount of sedatives and analgetics required. Poor bowel preparation is also a frequent cause for incomplete procedures.

The optimal grading scale uses objective terminology, is validated, and informs both on segmental as overall bowel preparation quality. The Boston bowel preparation scale fulfils all these criteria, making it the most used bowel preparation scale in colorectal cancer screening programs.

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Video related to this article

Video related to this article can be found online at <http://dx.doi.org/10.1016/j.vjgien.2013.05.001>.

1. Background

- Insufficient mucosal visualization during colonoscopy can result in lesions being missed [1,2].

- Poor bowel preparation may also result in difficult progression, an increase risk of complications, prolonged procedure duration and an increase in the amount of sedatives and analgetics required [3].
- Poor bowel preparation is also a frequent cause for incomplete procedures, resulting in the need for a repeat colonoscopy [3].
- Because of these consequences, the quality of bowel preparation needs to be assessed and documented [4].

2. Materials

- Colonoscope: CF-Q180AL/I Colonoscope, Olympus, Tokyo, Japan.

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- Flushing pump: Aqua:Master executive, Endo-technik, Solingen, Germany.
- Pump - biopsy channel connector: Bioshield irrigator, US Endoscopy, Mentor OH, United States of America.

3. Endoscopic procedure

- The Boston bowel preparation scale is the most extensively validated scale to assess the quality of bowel preparation [5,6].
- In this scale, the colon is divided in three segments: the right side (including cecum and ascending colon), the transverse colon (including the flexures) and the left sided colon, which includes the descending colon, sigmoid and rectum.
- Mucosal view should be scored after cleansing maneuvers like suctioning or washing have been performed.
- For all three sections cleansing is assessed and given a score ranging from 0 to 3.
- In case colon segments are not seen because the procedure is aborted due to inadequate cleansing, these segments are assigned a score of 0.
- The overall score is computed by adding the segmental scores resulting in a score ranging from 0 to 9, where 9 represents the best possible score.

4. Discussion

Insufficient mucosal visualization during colonoscopy can result in relevant lesions being missed. This has been shown in studies on colorectal cancer screening programs, where the adenoma detection rate is directly related to the quality of bowel preparation [2]. It has been suggested that the fact that colonoscopic surveillance does not prevent right-sided cancers is caused by the often worse quality of cleansing of the right side of the colon [7]. Poor bowel preparation can also result in difficult progression, an increased risk of complications, prolonged procedure duration and an increase in the amount of sedatives and analgetics required. Additionally, it is a frequent cause for incomplete procedures or interventions not being performed, resulting in the need for a repeat colonoscopy. Moreover, in screening or surveillance endoscopies, suboptimal bowel cleansing often results in shorter surveillance intervals [8]. These important consequences of inadequate preparation, need to be justified by proper documentation of the preparation quality in the endoscopy report. Many endoscopists describe the quality of bowel preparations in global terms like excellent, good, fair or poor. Usually, these terms are used to describe the overall quality of bowel preparation. Although these terms are widespread, it is not always clear what exactly is meant by these terms and there may be important differences in how these terms are being interpreted and used. Dichotomic descriptions like 'adequate-inadequate' or 'satisfactory-unsatisfactory', are usually used to describe the overall quality of cleansing of the bowel. A potential pitfall with such terms is that they are not solely the result of the mucosal visibility: they also take into account the indication for the investigation. For

instance, a poor quality of bowel preparation might be adequate in a colonoscopy performed to investigate bloody diarrhea, but would be inadequate for dysplasia surveillance in a patient with longstanding ulcerative colitis. So, although terms like 'adequate' or 'inadequate' do not describe the cleansing quality in segmental detail or nuances, these terms do answer the fundamental question: has this been a reliable investigation or not? They are therefore complementary to the formal description of mucosal visibility. One of the scales used to evaluate the quality of bowel preparation is the Aronchick scale [9]. This scale grades the adequacy of cleansing of colonic segments or the entire colon, using semi-quantitative descriptors:

- Excellent: Small volume of clear liquid, or greater than 95% of surface seen.
- Good: Large volume of clear liquid covering 5-25% of the surface but greater than 90% of surface seen.
- Fair: Presence of some semi-solid stool that could be suctioned or washed away but greater than 90% of surface seen.
- Poor: Semi-solid stool that could not be suctioned or washed away and less than 90% of surface seen.
- Inadequate: Repreparation needed.

It is often difficult to make estimations of the percentage of mucosa that is visualized, which may impair this score's practical use. Additionally, in many circumstances the presence of semi-solid stool and visualization of <90% of the mucosa (which is scored as 'poor'), can be interpreted as 'inadequate' as well. The Ottawa bowel preparation scale is another tool to assess adequacy of colonic cleansing [10]. For calculation of the score, the colon is divided in three segments: the right side (cecum and ascending colon), the mid-section (transverse and descending colon) and the rectosigmoid. For these three segments the following score is applied:

- 0 - Excellent cleanliness: Mucosal detail clearly visible. If fluid is present it is clear. Almost no stool residue.
- 1 - Good: Some turbid fluid or stool residue but mucosal detail is still visible. Washing and suctioning not necessary.
- 2 - Fair: Turbid fluid or stool residue obscuring mucosal detail. However, mucosal detail becomes visible with suctioning. Washing not necessary.
- 3 - Poor: Presence of stool obscuring mucosal detail and contour. However, with suctioning and washing, a reasonable view is obtained.
- 4 - Inadequate: Solid stool obscuring mucosal detail and contour, despite aggressive washing and suctioning.

Besides these segmental scores, an overall assessment of the fluid quantity is made, which results in a score from 0 to 2. The segmental scores and the fluid quantity score are then summed, resulting in an overall score ranging from 0 to 14, where 14 indicates the worst cleansing quality. A drawback is that the score includes the methods used to obtain mucosal view in case of residual bowel content, which may vary considerably between endoscopists. Additionally, the grading of the fluid quantity might be difficult to evaluate, and does not allow for segmental variation.

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