Quality Issues: How Can We Optimize Colonoscopy Performance?

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Introduction

Colonoscopy is considered as the "gold standard" for detection and removal of premalignant lesions in the colon. However, recent studies suggest that colonoscopy is not as gold as we would like and less protective for right sided than for left sided colorectal cancer (CRC).

Quality parameters

In literature several quality parameters have become apparent and these are summarized below.

1. Quality of the bowel preparation

Inadequate bowel preparation is associated with lower adenoma detection rates, incomplete colonoscopy and higher costs. The type and quality of the bowel preparation should be assessed during endoscopy and documented in the procedure report. It is essential to systematically document the quality of preparation by using the available validated bowel preparation scores.

2. Cecal intubation

Accumulating evidence suggests that colonoscopy is more protective for left sided than for right sided cancer. Amongst others, a possible explanation for this finding is that polyps in the right colon are not visualized, either because they are non-polyoid, because of inadequate bowel preparation or because this part of the colon is not visualized at all. Completeness of a colonoscopy is confirmed when the ileocecal valve and appendiceal orifice are visualized and this should be documented.

3. Adenoma detection rate

Although colonoscopy is considered the "gold standard" for polyp detection, back-to-back colonoscopies and comparisons with CT-colonography have clearly shown a miss-rate. Kaminski et al. have published a landmark study demonstrating an association between colonoscopy related quality indicators and the risk of interval CRCs. The authors demonstrated in a large cohort of 45,026 subjects that the endoscopists’ personal adenoma
detection rate is an independent predictor of the risk of interval cancer after a screening colonoscopy. An adenoma detection rate of 20% was determined as a threshold percentage, as lower values were associated with a higher risk for interval cancer.

4. Withdrawal time

To achieve adequate adenoma detection rates careful inspection of the colonic mucosa is essential. Several studies have shown a correlation between longer withdrawal times and higher adenoma detection rates. Apart from withdrawal time, withdrawal technique should be adequate, including visualization behind folds and bends by rotating the scope.

5. Polyp retrieval rate

Various polyp characteristics, including size, location, morphology and the technique of removal should be documented in the procedure report and a photograph of each polyp should be available. Furthermore, pathology should be available of the majority the lesions.

6. Burden of colonoscopy

The patients' burden during colonoscopy should be measured and documented. The modified Gloucester comfort score descriptors, ranging from no discomfort to severe discomfort, can be used to quantify the experienced discomfort of patients (Table 1). To reduce discomfort during colonoscopy, several randomised trials have shown that carbon dioxide instead of oxygen insufflation significantly reduces abdominal pain and discomfort in patients undergoing colonoscopy.

7. Complications during colonoscopy

Complications can occur either immediately during the procedure or several days later. To monitor the safety of colonoscopy programs, every institution should systematically register the incidence of complications and mortality up to 30 days after the procedure.

Table 1: Minimal set of quality indicators, auditable outcome measures and accepted standards

<table>
<thead>
<tr>
<th>Quality indicator</th>
<th>Outcome measure</th>
<th>Standard</th>
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<tr>
<td>Bowel preparation</td>
<td>Quality of bowel preparation</td>
<td>≥ 90% described as &quot;excellent&quot; or &quot;adequate&quot; preferably assessed with Boston or Ottawa bowel preparation scale</td>
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<tr>
<td>Cecal intubation</td>
<td>Cecal intubation rate with photodocumentation of cecal landmarks</td>
<td>≥ 90% in all colonoscopies and ≥ 95% in screening colonoscopies</td>
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<tr>
<td>Adenoma detection</td>
<td>Adenoma detection rate (number of patients with at least one adenoma / total number of patients)</td>
<td>≥ 25% in men and ≥ 15% in women during screening colonoscopies</td>
</tr>
<tr>
<td>Withdrawal time</td>
<td>Time in minutes from cecal pole to anus</td>
<td>≥ 6 minutes inspection in an intact colon</td>
</tr>
<tr>
<td>Polyp retrieval</td>
<td>Polyp retrieval rate</td>
<td>≥ 90% of polypectomy specimens</td>
</tr>
<tr>
<td>Burden</td>
<td>Gloucester comfort score</td>
<td>Not established</td>
</tr>
<tr>
<td>Complications</td>
<td>Incidence of perforation</td>
<td>≤ 1:1000 colonoscopies (diagnostic or therapeutic)</td>
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<tr>
<td></td>
<td>Incidence of post polypectomy bleeding</td>
<td>≤ 1:100 colonoscopies with polypectomy</td>
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Quality improvement

To understand their quality, endoscopy units should keep track of the various quality parameters, ideally electronically supported. Training, auditing and benchmarking the various quality parameters does improve quality in colonoscopy significantly.3 Besides, specific measures have shown to improve each of the quality parameters. For example, measures to improve cecal intubation rates include magnetic endoscopic imaging and adequate bowel cleansing, and measures to improve adenoma detection rate are e.g. dynamic position changes of the patient and the use of chromoendoscopy. It is important that studies on improvement of colonoscopy report on all relevant quality parameters.

Conclusions

Optimizing the effectiveness of colonoscopy is a continuous process and during the last decade several important quality indicators were defined. To enhance the diagnostic and therapeutic yield of colonoscopy, definition and measurement of quality parameters are essential in order to identify areas for improvement.

References