

Colon Polyp Diagnosis with Comprehensive Colonoscopy Screening; Review

¹Sultan Mousa Alkharmani, ²Abdulrahman Talal Albishri, ³Ahmad Omar Bajubair, ⁴Hesham Adnan Qary, ⁵Mahdi Dhafer Al Zulayq, ⁶Reiad Abdulelah Almohamadi, ⁷Abdalrhman Mesfer Alghamdi

Abstract: The main purpose of this review study was to evaluate the roles of colonoscopy in screening and detection of colorectal polyps, which might be transforming to carcinoma, this review discussing the advantage and disadvantage of colonoscopy in case of polyp's diagnosis. We searched PubMed, and Health Technology Assessment (HTA) databases for recent for studies concerning screening of colon polyps by using colonoscopy published up to May, 2017. Colorectal polyps are a usual finding in screening colonoscopies. A lot of these are of no scientific importance but, because of their high prevalence, the minority of such polyps that bear a deadly capacity still represents a central problem in preventive medicine. Early identification and also removal of these sores is a highly effective technique of stopping morbidity as well as death from colon carcinoma. The diagnosis of an intestines polyposis syndrome is at first recommended, based upon colonoscopic findings and also polyp histology. Enhancing varieties of surveillance colonoscopies for previous colonic polyps are being done. Each colonoscopy brings the burden of bowel prep work, possible discomfort, and risk of difficulties. Colonoscopy is a limited resource as well as must be recommended just with a strong indicator. People with non-advanced adenomas have actually no substantially increased risk of intestines cancer (CRC) as compared to the basic population.

Keywords: Health Technology Assessment (HTA), Colon Polyp diagnosis.

1. INTRODUCTION

'Polyp' is a term explains any type of mass extending into the lumen of a hollow vessel, anywhere in the gastrointestinal, respiratory or genitourinary tracts ⁽¹⁾. Generally, polyps occur from the mucosal layer of these body organs, although some submucosal pathologies could trigger mucosal projection into the lumen and appear like mucosal polyps ⁽¹⁾. Colon cancer (CRC) is among the few diseases for which testing programs have revealed to be efficacious in reducing both the occurrence along with the mortality. Randomized regulated trials have shown that repeated fecal occult blood screening (FOBT) lowers the mortality from CRC by 16%, while once-only versatile sigmoidoscopy decreases CRC occurrence as well as death by 18% as well as 28%, specifically ⁽²⁾. Total colonoscopy, as opposed to flexible sigmoidoscopy, has a possibly greater impact on the decrease in the incidence as well as mortality from CRC, this is still to be verified in a randomized trial ^(2,3).

Because of its capacity to analyze the whole colon as well as eliminate polyps for pathologic examination, introduction of colonoscopy gave an opportunity for clarifying this series. These pathology research studies have in recent years been associated with molecular hereditary studies ⁽⁴⁾. The adenoma-carcinoma series is now well established as the major path for the advancement of colorectal cancer in the basic population and also in risky patients in households with domestic adenomatous polyposis (FAP) as well as hereditary nonpolyposis intestines cancer (HNPCC) ^(5,6). The significant potential effect of optical medical diagnosis of polyps would certainly be the price financial savings required if the "resect and also discard" method or the "do not resect" method were carried out in medical method. Bulk of the polyps spotted throughout colonoscopy are diminutive, i.e., ≤ 5 mm in size as well as advanced histology like high quality dysplasia, villous attributes, or cancers cells is uncommon in these polyps ^(7,8). As a result, the primary purpose of sending out these polyps for histopathological evaluation is to set apart whether they are adenomatous or not as this details affects the

referrals for the future security colonoscopy intervals. If this info is identified by the endoscopist throughout the treatment, after that histopathologic al examination of these polyps would certainly end up being superfluous ⁽⁹⁾.

Colonoscopy continues to be at the forefront of avoidance as well as detection of intestines cancer. Detection of polyps and their removal from the standard premise by colonoscopy stops the advancement of intestines cancer. Adenomatous polyps are thought about the precursor sores for colon cancer, and consequently adenoma discovery rate has been commonly thought about as a vital quality indication of colonoscopy ⁽¹⁰⁾. The other major classification of polyps is the hyperplastic polyp which is general ruled out premalignant. Elimination of these polyps is a somewhat redundant practice specifically if they are petite (≤ 5 mm) and present in the distal colon. However, as polyp histology cannot be reliably distinguished with white light colonoscopy the existing criterion of care dictates elimination of all polyps identified throughout colonoscopy with the exception of multiple pale hyperplastic appearing polyps in the rectosigmoid area, ⁽¹¹⁾. Colon polyps might be categorized by their colonoscopic look as sessile (level, emerging straight from the mucosal layer) or pedunculated (prolonging from the mucosa via a fibrovascular stalk) (Figure 1) ⁽¹⁾.

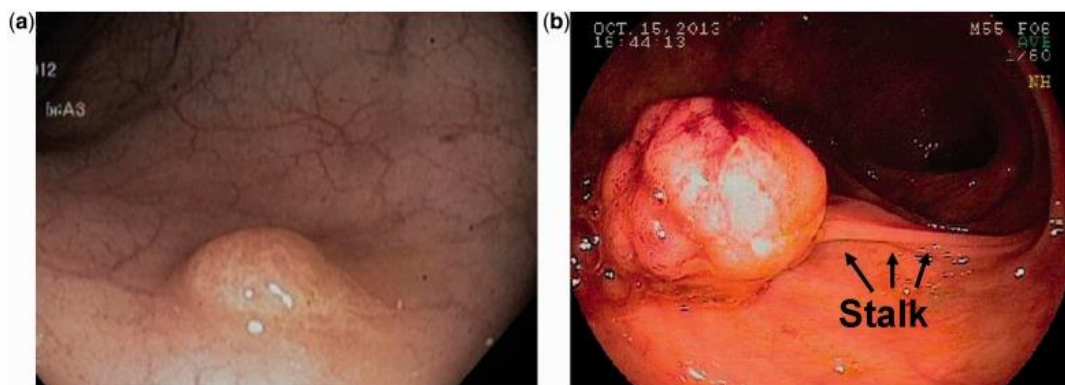


Figure 1: Colonoscopy view of sessile (1a) and pedunculated (1b) polyps.

The main purpose of this review study was to evaluate the roles of colonoscopy in screening and detection of colorectal polyps, which might be transforming to carcinoma, this review discussing the advantage and disadvantage of colonoscopy in case of polyp's diagnosis.

2. METHODOLOGY

We searched PubMed, and Health Technology Assessment (HTA) databases for recent for studies concerning screening of colon polyps by using colonoscopy published up to May, 2017. Medical Mesh terms were used in our search as following; "Colonoscopy" "Colon Polyps" "Colorectal cancer" "diagnosis" "screening". We applied restriction to our search for only English language articles with human subjects.

3. RESULTS

More often colon polyps are benign tumors that stem from the mucus-secreting colonic epithelial cells. Adenomatous polyps are common, particularly in western countries, taking place, in the United States, in 20- 40% of evaluating colonoscopies in individuals older compared to 50 years of age. One recent collection reported that adenoma rates depend upon age as well as gender ⁽¹²⁾. In people below 50 years old, 12% of women and also 24% of males were found to have an adenoma on a testing colonoscopy. In ladies as well as guys older compared to 80 years, the rates increased to 27% and 40%, specifically ⁽¹²⁾. A recent population-based research discovered that at the very least one polyp was detected in 34.3% of asymptomatic patients undertaking a testing colonoscopy ⁽¹³⁾. In autopsy series, the prevalence is also greater and also enhances with age. One-third to half of patients discovered to have a colonic adenoma have a synchronous colonic lesion ⁽¹⁴⁾. The factors contributing to the advancement of colonic adenomas are unclear and multiple; nonetheless, it is well accepted that both hereditary vulnerability as well as environmental factors play a role in this procedure. Cigarette smoking was revealed to be a risk factor for the advancement of colonic polyps ⁽¹⁵⁾; others include obesity, high consumption of red meat and reduced intake of fiber and also calcium ⁽¹⁶⁾.

As this concept of optical diagnosis of polyps is relatively novel as well as represents a significant paradigm change from conventional technique, there will be obstacles as well as barricades in its fostering into clinical practice ⁽¹⁷⁾. The significant barrier will certainly be the perceived medicolegal obligation by the gastroenterologists as they birth the responsibility of characterizing the polyp histology instead of the pathologists. If the polyp is not sent out to pathology,

saving a high image of the polyp in the colonoscopy record will offer as the matching of histology slides. Incorporation right into professional technique guidelines by the major gastroenterology cultures will certainly offer backing and also develop lawful criteria that might reduce the anxiety of gastroenterologists. Any type of significant modification from conventional practice is bound to meet with resistance because of trepidation, hesitation as well as inertia to alter especially if it lacks economic compensation. There might additionally be a monetary disincentive to adopt the "resect and throw out" or "do not resect" strategy if the gastroenterology practice possesses an economic interest in the pathology services by using a pathologist⁽¹⁸⁾.

○ Colonoscopy for polyps screening:

Colonoscopy is the 'gold standard' technique of spotting intra-luminal colonic lesions. Nonetheless, its sensitivity is not 100%. Several researches have demonstrated a variable 'missed out on' polyp price. One organized evaluation consisted of six research studies covering an overall of 465 patients who undertook 2 same-day colonoscopies. The 'miss' rate for polyps of any dimension was 22%, adenoma miss out on rate by size was 2.1% for adenomas ≥ 10 mm, 13% for adenomas 5 - 10 mm as well as 26% for adenomas 1- 5 mm⁽¹⁹⁾. Other researches have actually shown comparable results. Still, because a lot of big villous polyps are dispersed throughout the left colon, screening adaptable sigmoidoscopy every 5 years, starting at age 50, is advised by the World Health Organization and others⁽²⁰⁾.

Colonoscopy is widely made use of for the medical diagnosis as well as treatment of colonic conditions. Appropriately done, colonoscopy is usually secure, accurate, as well as well tolerated by many patients. Visualization of the mucosa of the entire big intestine and distal incurable ileum is normally possible at colonoscopy. In patients with chronic diarrhea, biopsy specimens could help identify the underlying problem. Polyps can be recognized and eliminated during colonoscopy (**Figure 2**), thus decreasing the risk of colon cancer. Making use of colonoscopy has ended up being accepted as one of the most effective method of screening the colon for neoplasia in patients over the age of 50 years as well as in more youthful patients at boosted risk⁽²¹⁾. The performance of colonoscopy in reducing colon cancer incidence relies on adequate visualization of the whole colon, persistence in taking a look at the mucosa, and patient acceptance of the procedure. Preparation quality impacts the ability to execute a total assessment, the period the treatment, and also the should terminate or reschedule treatments^(22, 23). Ineffective prep work is a significant contributor to costs⁽²⁴⁾. Longer withdrawal times have been demonstrated to enhance polyp detection rates,^(25,26,27) as well as conversely, fast withdrawal might miss out on sores as well as lower the effectiveness of colon cancer avoidance by colonoscopy. The miss out on rates of colonoscopy for big (≥ 1 cm) adenomas could be greater than previously assumed^(28, 29). Thus, careful examinations are required to optimize the performance of recommended periods in between testing and also monitoring assessments. Technical proficiency will help avoid issues that can offset any cost benefit proportion obtained by eliminating neoplastic lesions.

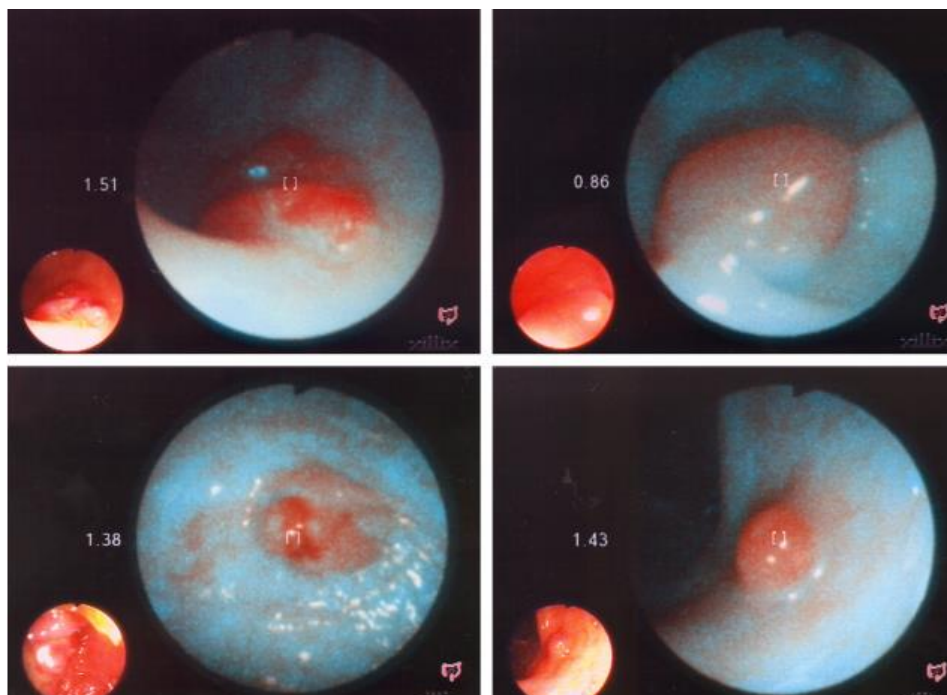


Figure 2: colonoscopy images of adenomatous polyps. Images of adenomatous polyps illuminated in fluorescence mode

○ **Advantage of colonoscopy:**

Colonoscopy screening has been revealed to be efficient in reducing CRC occurrence as well as mortality^(30,31). This effect is via a number system. To start with, the removal of pre-cancerous sores, i.e., adenomatous polyps, thereby interrupting the progression to carcinoma: avoiding cancers cells. Discovery of CRC at an earlier, pre-symptomatic stage with resultant increased chance of effective endoscopic or surgical treatment^(32,33). The third mechanism, which may decrease CRC occurrence and also mortality, is monitoring colonoscopy. Risk stratification accorded to index colonoscopy searchings for enables patients with polyps at greater risk of progression to cancer to be supplied a more assessment in the future^(34,35). The evidence for the possible advantages of monitoring will be reviewed thoroughly later. Patients diagnosed with CRC at an earlier phase have significantly far better prognosis compared to those diagnosed with much more extensive disease. Of patients diagnosed with Dukes' A CRC, 93% will make it through 5 years. Those detected with modified Dukes' D cancer nevertheless, have a less than 7% chance of living a more 5 years⁽³⁵⁾.

Colonoscopy is thought about to be the gold criterion for adenoma discovery and also manages a chance for therapy, through polypectomy, in addition to allowing histological medical diagnosis. Double-contrast barium injection and also CT colonography (CTC) show poorer sensitivity as compared to colonoscopy, particularly with respect to really small as well as flat polyps^(36,37). An ideally carried out double-contrast barium injection and also FIT (faecal immune-histochemical examination) discover only fifty percent of adenomas of 5 mm or larger that are identified by colonoscopy⁽³⁸⁾.

In a good-quality cross-sectional contrast, Pickhardt et al.⁽³⁹⁾ analyzed the sensitivity of same-day colonoscopy compared with CTC in 1,233 individuals in three medical centers in the United States. Subjects were asymptomatic adults (indicate age 57.8 years) without any personal history of polyps, CRC, inflammatory digestive tract disease, or domestic polyposis syndrome that were referred for colorectal cancer testing. CTC was carried out making use of fecal identifying with oral contrast. Among 6 experienced radiologists making use of a commercially readily available CTC system interpreted the outcomes. The radiologists saw the colon at first utilizing the 3D endoluminal fly-through view for finding polyps (making use of 1.25-- 2.5 mm collimation), then made use of 2D images for confirmation and analytical. Among 17 knowledgeable colonoscopists executed optical colonoscopy instantly after CTC interpretation utilizing conventional commercial video colonoscopes, with unblinding of the CTC results after examination of each section of colon. For any believed polyp seen on CTC that determined 5 mm or better, which was not seen on the preliminary blinded colonoscopy, the colonoscopist closely reexamined that segment as well as might assess the CTC photos for assistance. The precision (represented by lower adenoma miss out on prices) of colonoscopy exceeded that of CTC for adenomas equal to or higher than 6 mm in size (10 vs. 14 percent), nonetheless miss prices were higher for colonoscopy compared to for CTC for bigger adenomas ≥ 10 mm; and none of these distinctions were statistically significant. Level of sensitivity (each detection rate) for colonoscopy was 92 percent (155/168) for patients with adenomas ≥ 6 mm in dimension, compared with 89 percent (149/168) for CTC; sensitivity of colonoscopy was 92 percent (75/82) for patients with an adenoma ≥ 8 mm in dimension, compared to 94 percent (77/82) for CTC; and also sensitivity of colonoscopy was 88 percent (42/48) for patients with an adenoma ≥ 10 mm, compared with 94 percent (45/48) for CTC; none of these differences was statistically substantial. Colonoscopy detected just one of 2 intestines cancers (50 percent sensitivity), whereas CTC spotted both colorectal cancers⁽³⁹⁾.

○ **Disadvantage and limitation of colonoscopy:**

However, there remain limitations to colonoscopic testing. Even colonoscopy does not permit discovery of all adenomas. "Back-to-back" colonoscopies have suggested significant miss out on prices of 27% for small adenomas (< 5 mm) and also 6% for adenomas of greater than 10 mm size⁽⁴⁰⁾. Researches executing both CTC as well as colonoscopy quote that the colonoscopy miss rate for polyps over 10 mm in dimension may be as high as 12%⁽⁴¹⁾. There are numerous factors likely to add to missed polyps at colonoscopy consisting of quality of bowel preparation, and also the training and also experience of the colonoscopist. The moment taken by colonoscopists throughout withdrawal of the colonoscope from the caecum is an effective forecaster of adenoma discovery rate (ADR)⁽⁴²⁾. Greater prices of interval cancers are seen in association with reduced ADR at screening colonoscopy^(43,44).

The protection afforded by colonoscopy is dramatically better in regard of distal CRC as compared with lesions of the proximal colon. There are a number of factors proposed to explain this differential: poorer right-sided bowel prep work,

incomplete colonoscopy, anatomical factors restraining presence, as well as potentially various biology of right-sided lesions, especially using the serrated pathway⁽⁴⁵⁾.

Insufficient resection of adenomatous cells is thought to be a considerable factor to interval cancers cells. Rates of insufficient resection for small polyps are 29% for traditional biopsy as well as 17% for warm biopsy^(46,47). Residual polyp cells is more likely to stay after resection of sessile polyps and also risk increases with polyp dimension. Prices of 17% for polyps of 10-20 mm as well as 7% for lesions of 5-9 mm have actually been estimated. There additionally appears to be a higher rate of incomplete resection for serrated lesions in comparison to standard adenomas (31% and also 7% specifically)⁽⁴⁸⁾.

Missed lesions are likely to represent majority of interval cancers diagnosed at 3 to 5 years after the index procedure⁽⁴⁹⁾. As a result, the quality of the index as well as subsequent colonoscopies is vital in increasing the potential advantage of security procedures. Quality of colonoscopy is directly associated with rates of interval CRC⁽⁴⁴⁾.

Perforation is one of the most severe problem in the short term during or after colonoscopy. About 5% of colonoscopic perforations are fatal^(50,51). The prices of colonoscopic perforation differ extensively in the clinical literary works. One study from a well-established endoscopic center reported a general perforation rate of 1 in 500 in the 1990s⁽⁵²⁾. A population-based study of Medicare patients reported a total risk of opening of 1 in 500 however a risk of less than 1 in 1,000 testing patients⁽⁵³⁾. An evaluation of testing colonoscopy research studies disclosed no openings in the very first 6,000 reported instances⁽⁵⁴⁾. Expected opening rates in testing patients are lower since the patients are usually healthy and balanced and also have a tendency not to have actually connected colonic conditions that have been associated with perforation, including pseudoobstruction, ischemia, severe colitis, radiationinduced modifications, stricture development, bulky colon cancers, more severe kinds of diverticular disease, as well as chronic corticosteroid treatment.

4. CONCLUSION

Colorectal polyps are a usual finding in screening colonoscopies. A lot of these are of no scientific importance but, because of their high prevalence, the minority of such polyps that bear a deadly capacity still represents a central problem in preventive medicine. Early identification and also removal of these sores is a highly effective technique of stopping morbidity as well as death from colon carcinoma. The diagnosis of an intestines polyposis syndrome is at first recommended, based upon colonoscopic findings and also polyp histology. Enhancing varieties of surveillance colonoscopies for previous colonic polyps are being done. Each colonoscopy brings the burden of bowel prep work, possible discomfort, and risk of difficulties. Colonoscopy is a limited resource as well as must be recommended just with a strong indicator. People with non-advanced adenomas have actually no substantially increased risk of intestines cancer (CRC) as compared to the basic population.

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