A comparison of endoscopy versus pathology sizing of colorectal adenomas and potential implications for surveillance colonoscopy

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Background and Aims: The aim of this study was to compare endoscopy and pathology sizing in a large population-based series of colorectal adenomas and to evaluate the implications for patient stratification into surveillance colonoscopy.

Methods: Endoscopy and pathology sizes available from intact adenomas removed at colonoscopies performed as part of the Northern Ireland Bowel Cancer Screening Programme, from 2010 to 2015, were included in this study. Chi-squared tests were applied to compare size categories in relation to clinicopathologic parameters and colonoscopy surveillance strata according to current American Gastroenterology Association and British Society of Gastroenterology guidelines.

Results: A total of 2521 adenomas from 1467 individuals were included. There was a trend toward larger endoscopy than pathology sizing in 4 of the 5 study centers, but overall sizing concordance was good. Significantly greater clustering with sizing to the nearest 5 mm was evident in endoscopy versus pathology sizing (30% vs 19%, $P < .001$), which may result in lower accuracy. Applying a 10-mm cut-off relevant to guidelines on risk stratification, 7.3% of all adenomas and 28.3% of those 8 to 12 mm in size had discordant endoscopy and pathology size categorization. Depending on which guidelines are applied, 4.8% to 9.1% of individuals had differing risk stratification for surveillance recommendations, with the use of pathology sizing resulting in marginally fewer recommended surveillance colonoscopies.

Conclusions: Choice of pathology or endoscopy approaches to determine adenoma size will potentially influence surveillance colonoscopy follow-up in 4.8% to 9.1% of individuals. Pathology sizing appears more accurate than endoscopy sizing, and preferential use of pathology size would result in a small, but clinically important, decreased burden on surveillance colonoscopy demand. Careful endoscopy sizing is required for adenomas removed piecemeal. (Gastrointest Endosc 2016;84:341-51.)

Abbreviations: ACPGBI, Association of Coloproctology for Great Britain and Ireland; AGA, American Gastroenterology Association; BCS, bowel cancer screening; BSG, British Society of Gastroenterology; CRC, colorectal cancer; FOB, fecal-occult blood.

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Adenomatous polyps are well-recognized precursors of colorectal cancer (CRC).[1] The removal of colorectal adenomas has been shown to both reduce the incidence of, and prevent mortality from, CRC.[2,3] Screening for CRC reduces the number of deaths both by detecting early cancers at a treatable stage, and by detecting and removing adenomatous polyps, the latter being a much more common neoplastic finding at colonoscopy.[4] Postpolypectomy colonoscopic surveillance is required, but it is important to enter patients into an appropriate surveillance regimen that will optimize their reduction in CRC risk and mortality, without overburdening health care services.

BACKGROUND

There is agreement that the need for surveillance colonoscopy and suggested intervals should be determined by the findings at the initial colonoscopy. In 2002, and updated in 2010, the British Society of Gastroenterology (BSG) and the Association of Coloproctology for Great Britain and Ireland (ACPGBI) published guidelines for surveillance after colorectal adenoma removal. These suggest stratification of individuals into low, intermediate, and high risk based on the number and size of adenomas detected at baseline colonoscopy.[5,6] A cut-off adenoma size of ≥10 mm is specified. In 2006, the United States Multi-Society Task Force on CRC published broadly similar guidelines on postpolypectomy surveillance, updating previous versions.[7] These guidelines distinguish, for the purpose of stratification into low-risk or high-risk groups, those individuals with 3 or more adenomas, or any adenoma ≥10 mm in size, with villous features on histology or with high-grade dysplasia (so-called advanced adenoma) from those with 1 or 2 adenomas <10 mm in size. These guidelines have been endorsed and updated by the American Gastroenterology Association (AGA) in 2012.[8]

Surprisingly, none of these guidelines offer any detail on how to measure adenoma size, and specifically whether to use endoscopy or pathology in recording baseline colonoscopy findings. The reason for this is likely that the cited publications that provide the evidence base for these guidelines variably use endoscopy or pathology size, and most lack any further detail on how size was derived (Table 1).[2,9-41] Recent guidelines related to CRC screening and management of malignant colorectal polyps have advocated use of pathology size over endoscopy, stating that pathology size is auditable, accurate, simple to perform, and offers the ability to measure the adenomatous component of mixed lesions. [42,43] There is some evidence to support these conclusions, but the relevant studies are mostly based on single-center experience and mostly involve small study numbers, ranging from 31 to 235 adenomas.[44-50] Thus, the evidence base for making recommendations on sizing is limited and requires expansion.

TABLE 1. Summary of recommendations for adenoma sizing within all studies providing original data cited by U.K.[5,6] and U.S.[7,8] guidelines for colonoscopy surveillance after adenoma removal[2,9-41]

Publication	Recommended method of adenoma sizing
Alberts et al, 2005[29]	Not stated
Atkin et al, 1992[9]	Pathology (maximum diameter of fixed specimen)
Avidan et al, 2002[10]	Endoscopy (open biopsy forceps comparison or measured after excision)
Baron et al, 1999[27]	Endoscopy
Baron et al, 2003[24]	Endoscopy
Bertario et al, 2003[11]	Pathology (maximum diameter of fixed specimen)
Blumberg et al, 2000[12]	Endoscopy
Bonithon-Kopp et al, 2004[13]	Endoscopy
Chung et al, 2011[14]	Endoscopy (open biopsy forceps comparison or measured after excision)
Cottet et al, 2012[15]	Pathology
Fossi et al, 2001[16]	Endoscopy
Jorgensen et al, 1995[17]	Endoscopy (measured after excision)
Laiyemo et al, 2008[18]	Endoscopy
Lieberman et al, 2007[19]	Endoscopy (open biopsy forceps comparison)
Martinez et al, 2001[20]	Endoscopy
Miller et al, 2010[31]	Endoscopy
Miller et al, 2010[32]	Endoscopy
Noshirwani et al, 2000[33]	Endoscopy
Nusko et al, 2002[34]	Adenomas ≤5 mm, endoscopy (open biopsy forceps comparison); adenomas >5 mm, pathology
Schatzkin et al, 2000[23]	Endoscopy
Stryker et al, 1987[39]	Barium enema
Van Stolk et al, 1998[38]	Endoscopy
O'Brien et al, 1990[35]	Endoscopy (open biopsy forceps comparison)
Yamaji et al, 2004[40]	Endoscopy (open biopsy forceps comparison)
Yang et al, 1998[41]	Pathology

The aim of this large, multicenter study was to compare the endoscopic and pathologic sizes recorded for colorectal adenomas removed intact during colonoscopy performed in the setting of a national CRC screening program, in order to identify and quantify the factors associated with discordant sizing, to assess the potential impact of discordant adenoma sizing on colonoscopy surveillance, and to inform future recommendations for the most accurate sizing of adenomas.