Sessile serrated polyp prevalence determined by a colonoscopist with a high lesion detection rate and an experienced pathologist

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Background: The prevalence of sessile serrated adenomas and/or polyps (SSA/Ps) is uncertain.

Objective: To determine the prevalence of SSA/Ps and SSA/Ps with cytologic dysplasia (SSA/P-CD) by using a colonoscopist with a high lesion detection rate and an expert in serrated lesion pathology.

Design: Retrospective screening colonoscopy study.

Setting: Academic endoscopy unit.

Patients: A total of 1910 average risk, asymptomatic patients aged ≥50 years underwent screening colonoscopy between August 2005 and April 2012 by a single colonoscopist with a high lesion detection rate.

Interventions: Slides of all lesions in the serrated class proximal to the sigmoid colon and all rectal and sigmoid colon serrated lesions >5 mm in size were reviewed by an experienced GI pathologist.

Main Outcome Measurements: Prevalence of SSA/Ps, defined as the proportion of patients with ≥1 SSA/P.

Results: There were 1910 patients, of whom 389 had 656 lesions in the serrated class. Review by the experienced GI pathologist determined a prevalence of SSA/Ps without cytologic dysplasia of 7.4% and SSA/Ps-CD of 0.6% (total SSA/P prevalence 8.1%). SSA/Ps and SSA/Ps-CD comprised 5.6% and 0.3%, respectively, of all resected polyps. The mean size of SSA/Ps was 7.13 mm (standard deviation [SD] 4.66), and 51 of 77 (66.2%) polyps ≥10 mm in the serrated class were SSA/Ps.

Limitations: Retrospective design.

Conclusion: A colonoscopist with a high lesion detection rate and an experienced pathologist identified a high prevalence (8.1%) of SSA/Ps in a screening population. SSA/Ps are more common than previously believed. (Gastrointest Endosc 2015;81:517-24.)

The serrated pathway for colorectal neoplasia accounts for about one third of all colorectal cancers (CRCs) and a disproportionately elevated fraction of interval CRCs (cancers diagnosed within a few years after colonoscopy).[1] Cancers associated with the serrated pathway typically show high levels of methylation of promoter CpG islands, often demonstrate microsatellite instability, and tend to occur in the proximal colon.[2,3] Serrated lesions are characterized histologically by a saw-toothed appearance of the crypt epithelium. The subtypes of serrated lesions are the hyperplastic polyp (HP), the sessile serrated adenoma (synonymous with sessile serrated polyp; SSA/P), and the traditional

Abbreviations: CRC, colorectal cancer; HP, hyperplastic polyp; SSA, sessile serrated adenoma; SSA/P, sessile serrated adenoma/polyp; SSA/P-CD, sessile serrated adenoma/polyp with cytologic dysplasia; SSP, sessile serrated polyp; TSA, traditional serrated adenoma; WHO, World Health Organization.

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serrated adenoma (TSA). These subtypes are defined based on histologic and molecular profiles and have variable potential to develop into CRC.[4,5] The most important lesion in the serrated class is the SSA/P, because it is both common (unlike the TSA) and has malignant potential (unlike HPs).[6]

Despite the increased recognition of the importance of SSA/Ps, there are few data regarding their prevalence in average-risk patients. Prevalence rates derived from older autopsy studies are difficult to extrapolate, because these studies were conducted before serrated lesion subtypes were recognized and generally considered all serrated lesions as "hyperplastic."[1,7-14] Recent studies have reported colonoscopic prevalence rates of SSA/Ps ranging from 0.6% to 5.3%, with a single study showing a higher prevalence of 13.8% (Table 1).[15-24] However, these studies used variable pathologic criteria to define SSA/Ps and were generally based on data from unselected patients undergoing colonoscopy. Further, previously reported prevalence rates reflect the mean detection rates of endoscopists with highly variable rates of detection of serrated lesions. SSA/Ps can be challenging to detect endoscopically, as evidenced by series showing that the variation in detection rates for endoscopists is much greater for serrated lesions than for conventional adenomas.[15,25,26] In addition to variable endoscopic detection, there is high interobserver variability in the differentiation of SSA/Ps from HPs.[27-29] This is largely because some serrated polyps have features of both HPs and SSA/Ps, and the minimum number of SSA/P features required for an SSA/P diagnosis has been a matter of controversy.[27-29]

An approximation of the population prevalence of SSA/Ps can be obtained from screening colonoscopies performed on average-risk patients by an operator with a high detection rate for serrated lesions, coupled with review of histology by an experienced pathologist with specific interest in serrated polyps using the most recent World Health Organization (WHO) consensus guidelines.[5] By using this approach, we aimed to determine the prevalence of SSA/Ps in asymptomatic, average-risk persons.

METHODS

This was a retrospective study of colonoscopies performed at Indiana University Hospital in Indianapolis, Indiana, and an associated ambulatory surgery center, followed by retrospective review of pathology slides. The study was approved by the Institutional Review Board of Indiana University Health. We reviewed an electronic database for all average-risk patients aged $\geq$50 years who underwent a screening colonoscopy between August 2005 and April 2012 by an endoscopist with high detection rates for adenomas and serrated polyps (D.K.R.).[25,30-32] The colonoscopes in use during the study time frame were primarily high-definition Olympus 180 series (Olympus America, Inc., Center Valley Pa), although in the first 2 years a few examinations were performed with Olympus 160 series colonoscopes. Nearly all polyps were detected in white light. Narrow-band imaging or chromoendoscopy were each used in a minority of cases in which patients were participating in an unrelated clinical trial.

The study endoscopist routinely removes all polyps detected proximal to the sigmoid colon and all polyps from the rectosigmoid colon except lesions $\leq$5 mm in size that appear unequivocally hyperplastic. The polypectomy method depended largely on polyp size. In general, some polyps sized from 1 to 3 mm were removed with cold forceps when they could be removed in a single bite, polyps of 2 to 7 mm were removed mostly via a cold snare procedure, and some polyps of 8 to 9 mm and nearly all polyps $\geq$10 mm were removed via a hot snare procedure. Cold snare resection was used to remove 74.5% of all polyps.

The database contains periodically and prospectively updated information on all colonoscopies done at the University Hospital and a satellite surgery center. Information included patient demographics; colonoscopy data including number of polyps and location, size (determined at the time of endoscopy), and shape of each polyp; and the histopathology of all polyps removed, including the presence of high-grade dysplasia and cancer. Patients who underwent diagnostic colonoscopy (for evaluation of symptoms such as abdominal pain, anemia, altered bowel habits), who had a personal history of inflammatory bowel disease or a family history of familial adenomatous polyposis, or who underwent surveillance colonoscopy (post-polypectomy or post-CRC resection) were excluded. Among average-risk patients who underwent screening colonoscopy, we identified patients with $\geq$1 polyp in the serrated class (HP, SSA/P, or TSA) of any size proximal to the sigmoid colon or $\geq$1 serrated polyp $>$5 mm in the rectum or sigmoid colon. The right side of the colon was defined as the cecum, ascending colon, transverse colon, and splenic flexure. The left side of the colon was defined as the descending colon, sigmoid colon, and rectum.

Pathology reinterpretation

The slides were originally read by board-certified pathologists at Indiana University between 2005 and 2012. Pathology slides were retrieved and reviewed by an outside GI pathologist (D.C.S.) with expertise in serrated lesion pathology who was blinded to polyp anatomic location, shape, size, and initial histopathologic diagnosis. Each polyp had 2-step level sections available for review. All polyps from each individual patient were considered for pathology analysis. For calculating prevalence of findings identified by our institutional pathologists, patients were grouped according to the presence of $\geq$1 SSA/P, mixed tubular adenoma/hyperplastic polyp without mention of sessile serrated polyp (SSP), or only HP, based on the initial pathology report. For calculating prevalence based on expert reassessment