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Caught in the act: endoscopic characterization of sessile serrated adenomas with dysplasia

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The serrated pathway accounts for up to 30% of colorectal cancers[1,2] and is implicated in the relative failure of colonoscopy to protect against colorectal cancer in the proximal colon.[3,4] The sessile serrated adenoma (SSA) is the major precursor in this pathway. The development of dysplasia (D) within an SSA is a critical event and represents a rapidly accelerated phase in the progression to cancer.[2,5] Improvements in image definition and the evolution of push-button image enhancements, such as narrow-band imaging (NBI), permit accurate endoscopic prediction of polyp histopathology without the requirement for magnification,[6,7] allowing implementation in mainstream clinical practice. Moreover, these methods allow accurate real-time endoscopic prediction of advanced histology and early invasive change in conventional adenomas. Recognition of these features is important because a change in the proposed management strategy may be necessary.

Although the endoscopic appearance of SSAs has been described,[8,9] the endoscopic appearance of SSAs with advanced histology, termed *cytologic dysplasia,* (sessile serrated adenoma with dysplasia, [SSA-D]) has not been studied. It is now accepted that pathologically, there are 2 established forms of dysplasia—serrated and conventional adenomatous.[5] Adenomatous dysplasia appears to be most common and has a tubular or tubulovillous morphology.[5,10] The real-time endoscopic detection of dysplasia within an SSA may have important therapeutic implications. We report the endoscopic and clinical features of a consecutive prospective series of SSA-D lesions with adenomatous dysplasia identified endoscopically at our center.

METHODS

We have been systematically studying SSAs within a prospective observational study of all patients referred for EMR of sessile colorectal polyps >20 mm since 2008. During this period, we began to endoscopically identify a subset of SSAs with apparent foci of conventional adenoma within them. These were later confirmed histologically as SSA-D. Over a 12-month period, initially in the tertiary-care referral cohort

Abbreviations: NBI, narrow-band imaging; NICE, NBI International Colorectal Endoscopic classification; SSA, sessile serrated adenoma; SSA-D, sessile serrated adenoma with dysplasia.

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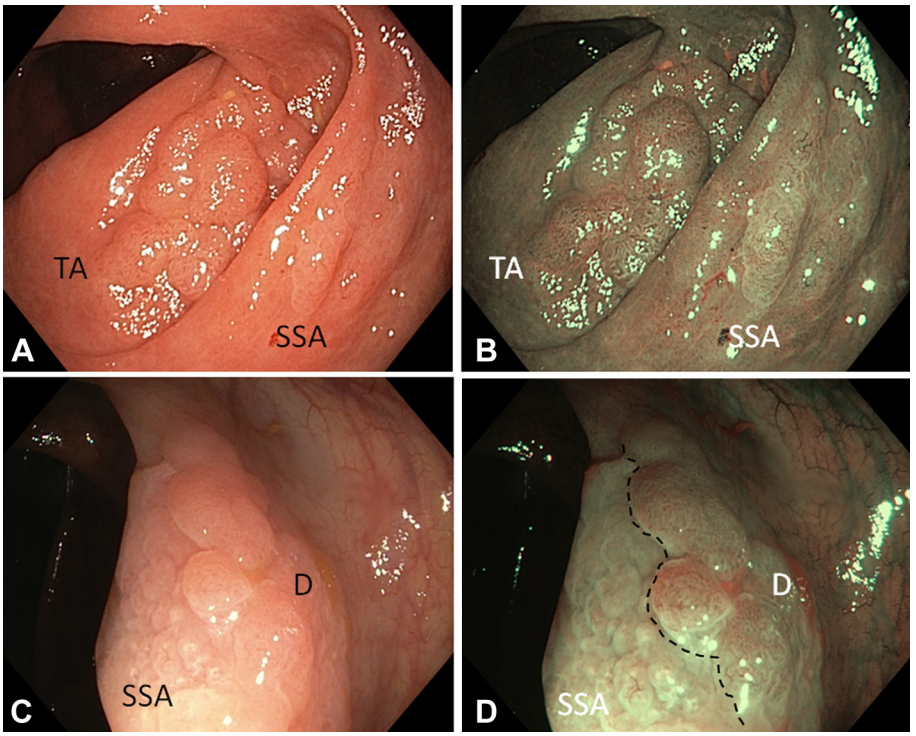

Figure 1. Two separate lesions are shown. **A,** Under high-definition white light (HD-WL). **B,** Under narrow-band imaging (NBI). A granular Paris 0-IIa tubular adenoma is noted on the left of a nongranular Paris 0-IIa sessile serrated adenoma (SSA) situated on a mucosal fold. Both have distinct morphologic features. The NBI image shows the distinctive mucosal surface pattern of the tubular adenoma (Kudo type III) and SSA (Kudo type II). The tubular adenoma has a dense vascular pattern on NBI, consistent with Sano II/NICE 2, in contrast to the bland appearance of the SSA. **C,** SSA with dysplasia under HD-WL. **D,** SSA with dysplasia under NBI. Both show a non-homogenous surface morphology with both features of an SSA and conventional adenoma (corresponding to the area of dysplasia). A "transition zone" (*dotted line*) can be appreciated separating these features, which is enhanced by NBI. *TA,* tubular adenoma; *SSA,* sessile serrated adenoma; *D,* dysplasia.

but then in the last 6 months as a standard survey of routine colonoscopy cases performed by the authors to July 2013, all SSAs identified with this feature were prospectively characterized and findings were recorded.

Colonoscopy was performed with Q180HD or 190HD PCF/CF instruments (Olympus, Tokyo, Japan). If an SSA-D was suspected, careful inspection and photographic documentation were undertaken with white light and NBI. Morphology was characterized according to the Paris classification and surface pattern by pit (Kudo) and vascular pattern by Sano/NBI International Colorectal Endoscopic classification (NICE).[11] Real-time prediction of polyp histology was made as part of the lesion assessment. All lesions were removed via EMR or conventional polypectomy and submitted for pathology assessment. All lesions suspected to be SSA-D were finally reviewed by 2 expert GI histopathologists. The study was approved by the Western Sydney local health district Human Research Ethics committee.

Endoscopic appearance and diagnosis of SSA-D

Nondysplastic SSAs have well-documented characteristic features and a relatively homogeneous appearance[9] (Fig. 1A and B). In contrast, in these cases we found SSA-D to have 2 differing and distinct morphologic areas that met at a clear, endoscopically apparent transition point (Figs. 1C and D, 2). It is now established that histologically the area of dysplastic change can resemble conventional adenoma, and we believe that the transition from serrated architecture to adenomatous may be readily identified endoscopically (Figs. 3 and 4).

The approach is as follows: after observing a serrated lesion, if a variation in surface morphology is detected, then this alerts the endoscopist to a possible dysplastic SSA (Figs. 2 and 3). Closer inspection with white light may confirm a transition point with a change in surface appearance from the usual flat SSA morphology (Paris IIa) to a small centrally or peripherally located 1 to 5–mm nodule (Figs. 1C, 2A and C, 4A and B) or minimally elevated (occasionally depressed) area within the lesion. This area heralds the underlying dysplastic component. The nodule, however, usually is not sufficiently elevated to be labeled a true 0-Is component in most cases.

Next, the surface pit pattern of the lesion is assessed by white light and NBI. This often reveals 2 distinct patterns corresponding to the different morphology. The flat, serrated component exhibits pit pattern type II/II-0 (stellar or papillary), and the dysplastic area exhibits a type III (tubular or small roundish pits) or type IV (gyrus-like pits) pattern. The dysplastic component is