

# ADVANCES IN ENDOSCOPY

Current Developments in Diagnostic and Therapeutic Endoscopy

Section Editor: Todd H. Baron, MD

## Techniques for Detection and Complete Resection of Sessile Serrated Polyps



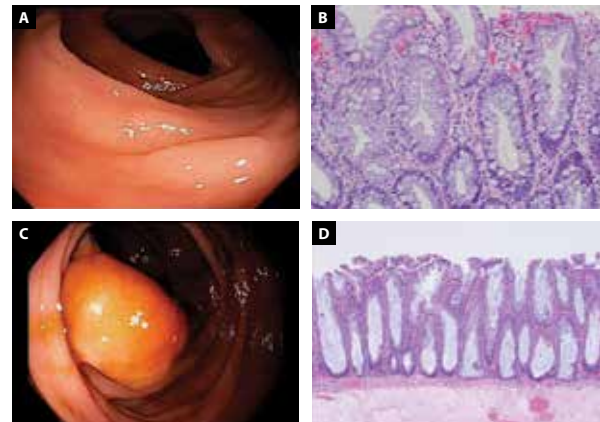
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### G&H What characterizes sessile serrated polyps, and how are they distinguished from hyperplastic polyps?

**JA** Sessile serrated polyps (SSPs) and hyperplastic polyps (HPs) are part of a larger category of serrated polyps that also includes traditional serrated adenomas (TSAs). Thus, the term “serrated” refers to the entire category. Further confusingly, sessile also can be used to describe the shape of the polyp. Most serrated polyps are typically non-pedunculated or flat. In addition to describing a type of serrated polyp, a SSP, sessile can also mean that the lesion has a morphology or shape that is in between a pedunculated polyp and a flat polyp—somewhat resembling half of a dome.

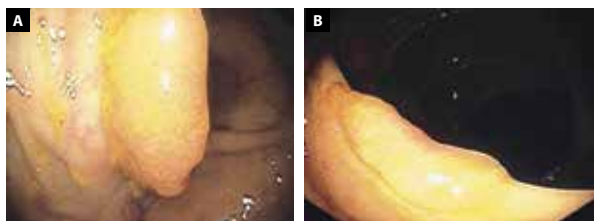
In terms of differentiating HPs from SSPs, HPs are flat with mild serrations that resemble small cul-de-sacs (Figure 1A-B). Whereas SSPs have serrations that extend all the way to the base, the serrations of HPs are luminal. Figure 1C shows the endoscopic appearance of a SSP. On endoscopy, a distinctive mucus cap may be seen with SSPs. If that mucus is washed away, the lesion is easily missed. The borders are indistinct. A boot-shaped gland at the base, seen on histology, is diagnostic for a SSP (Figure 1D).

Serrated polyps were once all categorized as HPs. In the past, if such lesions were visualized, the patient was told to return in 10 years for a colonoscopy. These were

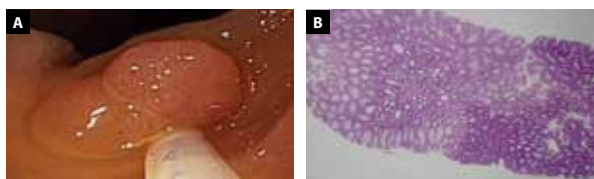


**Figure 1.** An endoscopic view of a hyperplastic polyp, which is pale, flat, and distal (A). Its histology shows mild serrations resembling cul-de-sacs (B). In contrast, an endoscopic view of a sessile serrated polyp reveals a proximal, flat polyp with indistinct borders and O-pits that can have mucus caps (C). Its histology shows a cystic change at the base and boot-shaped crypts (D).

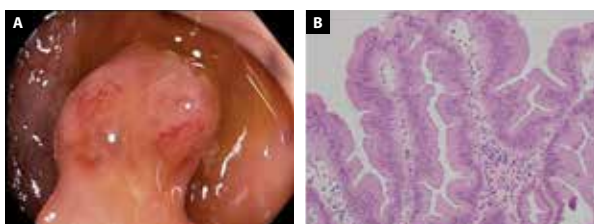
considered to be average-risk lesions. Several decades ago, large HPs were being detected and were thought to be benign. While at Stony Brook University, Dr Bonnie Pollack and I recognized that some of these lesions could progress to dysplasia (Figure 2), resulting in us publishing the earliest endoscopic description of SSPs with dysplasia.



**Figure 2.** A cluster of hyperplastic polyps (A). They are sessile, pale, and smooth, and can be covered in mucus. One of these polyps is dysplastic (B).



**Figure 3.** Endoscopic (A) and histologic (B) views of a sessile serrated polyp with dysplasia. Characteristic O-pits are seen in the histology.



**Figure 4.** Endoscopic (A) and histologic (B) views of a traditional serrated adenoma. Its histology shows deep serrations.

The finding of dysplasia was significant because it suggested that HPs could have a malignant transformation.

Again, it should be noted that a serrated polyp can be either a benign HP, a SSP, or a TSA. TSAs are much easier to identify on endoscopy and histology than SSPs.

It is now being recognized that SSPs are responsible for a large percentage of colorectal cancer—possibly up to 30%. Thus, detection is important but challenging because features of serrated lesions—such as their flat terrain and indistinct borders—cause them to be easily missed and difficult to completely resect when they are detected.

Although the number of cancers that started as SSPs has been difficult to determine, analysis shows that oncogene mutations of *BRAF* and *KRAS* in particular can be surrogate markers and can help distinguish the cancers in the 2 pathways. *BRAF* mutations generally are associated with serrated polyps and *KRAS* with conventional adenomas. A large percentage of colorectal cancers are now proving to be *BRAF*-positive. This is the evidence that suggests that the serrated pathway can account for a large number of colorectal cancers.

Endoscopically, SSPs can have different appearances. These polyps typically have indistinct and irregular borders. They may have a characteristic mucus cap, and it is important to make note of its presence. Care must be taken when washing the colonic mucosa because the mucus cap can help outline the polyp, and removing the cap will make the polyp borders harder to discern. When washing the area, water can splay when it hits a hyperplastic area. I use this technique to detect serrated polyps that might otherwise go undetected.

Figure 3 shows endoscopic (A) and histologic (B) views of a SSP with dysplasia. The darker purple area on the right side of Figure 3B is an adenoma. Serrations can be seen on the left, and a sharp demarcation—which is the dysplasia—occurs toward the right.

TSAs (Figure 4A-B) are very rare, representing 1% of all serrated polyps. Deep serrations are seen on histology (Figure 4B).

#### G&H What detection or visualization methods are best, and how have these tools improved over time?

**JA** Several different techniques or technologies have been introduced over the past several years that may increase the detection of serrated polyps. One is the use of high-definition endoscopy, which allows for better visualization of the polyps because of higher resolution. Dye spraying of the colon or chromoendoscopy has been helpful in detecting polyps, but tends to detect small polyps and is very time-consuming and so likely is not very efficient. Total underwater colonoscopy is another technique; however, a high-quality bowel preparation—namely adequate cleansing—must be used for best visualization.

A longer endoscopy withdrawal time also benefits better detection. Most endoscopists take 6 minutes during a typical normal examination, and this has been the recommended benchmark; however, 9-minute withdrawal times seem to be associated with a much higher rate of detection of SSPs. Findings from a study based on data from the New Hampshire Colonoscopy Registry demonstrated that the rate of detection of large SSPs doubled when the median normal examination withdrawal time was extended from 6 minutes to 9 minutes.

#### G&H How best can a practitioner help ensure complete resection of a serrated or adenomatous polyp?

**JA** The CARE study, led by my colleague Dr Heiko Pohl, showed that incomplete resection of serrated polyps is common. The rate of incomplete resection of small adenomas (5-9 mm) was 6.8% and that of large adenomas



**Figure 5.** An endoscopic view of a sessile serrated polyp undergoing endoscopic mucosal resection (A). The lesion is submucosally injected with fluid, which causes it to become raised and better defined (B). A clean resection is achieved (C).

(10–20 mm) was 17.3%. The rates for SSPs were 14.3% and 47.6%, respectively. The primary challenge for SSPs is the presence of indistinct borders.

The US Multi-Society Task Force on Colorectal Cancer recommends cold snare polypectomy for small lesions to remove adenomatous tissue en bloc along with surrounding normal mucosa, and cold endoscopic mucosal resection (EMR) for large and flat lesions. EMR uses submucosal injection to lift the lesion before snare resection (Figure 5A–C). A contrast stain, such as indigo carmine, is useful in this setting. Specifically, this stain is combined with the fluid that is injected into the submucosa.

#### **G&H** What concerns and caveats do practitioners need to know about these procedures, including different snare techniques?

**JA** Practitioners should be aware that circumstance and lesion size determine whether a hot or cold snare technique is used. As previously noted, cold snare polypectomy is preferred for lesions smaller than 1 cm. If the lesion is larger than 10 mm, a cold technique is still acceptable and has been used for lesions 20 mm and larger, but a hot technique may be needed to resect the lesion.

With cold snare polypectomy, the snare should be pushed deep into the mucosa to obtain a good hold of it. A 2-to-3-mm border should be made around the lesion. This can be challenging with serrated polyps because of their indistinct borders, but the challenge to resect can be significantly reduced with EMR, as previously described.

With a hot technique, which basically involves cauterization, the lesion is tented up, so the border may not be as wide as with a cold technique.

Importantly, when visualizing a serrated lesion, clinical suspicion should be high for a SSP even though chances are that the lesion is a HP. This is when EMR comes into play to help ensure complete removal of the lesion in case dysplasia or risk for dysplasia is present.

In summary, the endoscopist should make sure that the colon is adequately cleaned and the preparation is thorough. Adequate time should be taken to fully examine the site, including looking behind the folds. A longer withdrawal time, which is a surrogate for inspection time, is extremely important. Spraying the lumen while being vigilant for how the water splays when striking a mucus cap can help prevent missing a serrated polyp.

It is also important to note that skill at detection improves with experience. The more an endoscopist examines and inspects the colon, the better he or she will be able to recognize patterns and detect serrated lesions. The endoscopist should recognize an O-pit and look at how that section of the mucosa differs from an adjacent section, or he or she will recognize the telltale mucus cap and know that it should not be washed away because doing so will obscure the edges of a serrated lesion.

#### **Disclosures**

*Dr Anderson has no relevant conflicts of interest to disclose.*

#### **Suggested Reading**

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