Serrated Polyps and Polyposis
Improving Detection and Management

David A. Johnson MD MACG FASGE
Professor of Medicine
Chief of Gastroenterology
Eastern VA Medical School
Norfolk VA

Outline

• What are they
• Why important
• Pearls for endoscopic recognition
• Pearls for endoscopic resection
• Serrated polyposis syndrome
• Role of surgery
Serrated polyps

- Serrated lesions characterized histologically
  - serrated (or saw-toothed) crypt epithelium
- 30 yrs ago called “hyperplastic” polyps
  - were thought to have no malignant potential
- Subset of serrated lesions precursor CRCs that:
  - exhibit hypermethylation
  - arise primarily proximal colon

10-20% CRC
> 1/3 interval CRCs

Am J Gastroenterol 2009; 104:695-702

Differentiation of SSA / P from HP

- Presence of at least one crypt:
  - architecturally distorted, dilated
  - and / or horizontally branched crypt

Sufficient for a diagnosis of SSA / P

- Substantial inter-observer variation

Moderate at best, including expert pathologists

Am J Clin Pathol 2007; 127: 938 – 45
Sessile serrated adenoma / SSA/P

- Distorted crypt dilated and / or branched
  - formation of “boot” or “L”
- Disorganized saw-toothed surface

WHO Pathological Classification
Serrated Colorectal Polyps

- Hyperplastic polyp
- Sessile serrated adenoma / polyp
  - With or without cytological dysplasia
- Traditional serrated adenoma

Sessile serrated adenoma = Sessile serrated polyp

WHO Classification of Tumours of the Digestive System
Serrated Pathway
So Why Now So Important?

- Serrated pathway (10-20% CRC)
- Interval cancers (>1/3 CRC)
  : proximal
  : CIMP-H and MSI (+)
- SSA/Ps are associated
  : proximal
  : CIMP-H and MSI (+)
- CRC larger SSA/Ps are associated
  : shorter times to CRC diagnosis

Implications of
: Unrecognized
: Incomplete resection

http://dx.doi.org/10.1016/j.gie.2014.03.050

Endoscopic features

- SSA / Ps and HPs are almost always sessile or flat
- TSAs tend to be bulkier than SSA / P
  - rare overall (10%) and rarely pedunculated
- Large SSA/ P may develop folds
  - “ wrinkle ” when snared
  - appearance of redundant mucosa
Endoscopic Appearance
Serrated Lesions

• Mucus cap in 64 %

Rim of debris or bubbles in 52 %
Endoscopic Appearance
Serrated Lesions

- Mucus cap in 64%
- Rim of debris or bubbles in 52%
- Alteration contour of a fold in 37%
- Interruption mucosal vascular pattern in 32%
Endoscopic Appearance
Serrated Lesions

• Mucus cap in 64 %
• Rim of debris or bubbles in 52 %
• Alteration contour of a fold in 37 %
• Interruption mucosal vascular pattern in 32 %
SSA/P with Cytologic Dysplasia: Triple Threat for Interval CRC

Detection Rates SSA/P

- Detection rate variable - dependent on endoscopist 1 to 18%
- Correlation with ADR/withdrawl times
- Suggested quality mean prevalence rate 5%

Gastrointest Endosc. 2012;75(3):515-520
Am J Gastroenterol 2010; 105: 2636 – 64
Clin Gastroenterol Hepatol 2011; 9: 42 – 6
Risk factors

- Distal serrated lesions are associated with:
  - Alcohol intake
  - Fiber intake
  - Calcium intake
  - NSAIDs
  - Family history of CRC
  - High body mass index
- Proximal and distal right-sided serrated polyps
  - Cigarette smoking

Endoscopic Resection
Serrated lesions: Where and When?

- Complete removal of all serrated lesions except:
  - Diminutive sigmoid or rectal lesions
- Multiple diminutive (≤ 5 mm) rectum/sigmoid
  - Randomly sampled for histology
Principals of endoscopic resection

• Serrated lesions < 1 cm
  - resect with or without electrocautery
• Cold snaring more efficient/effective
  - than piecemeal resection using cold forceps
  - include narrow margin of normal mucosa
• Hot snare:
  - inclusion rim normal mucosa not strictly necessary
  - probably safe when submucosal injection

Principles for endoscopic resection

• Complete resection KEY!
• Approximatey 1/3 all SSA/Ps
  - incompletely resected 48% for lesions 10-20 mm
• Issues: size, shape, and location
• May not be endoscopically resectable
  - appendiceal or IC valve orifice
• Key issue: accurately identifying all borders

Gastroenterology 2013;144:74–80

With polypectomy edema/bleeding
Difficult at times accurate border ID
Adjuncts for SSA/P Detection and Resection

- High-definition
- Electronic highlighting
- Scope adjuncts (cap or Endocuff)
- Surface dye-spraying
- Submucosal injection of fluid/ contrast agent
  - hydroxyethyl starch plasma expander
  - 3cc indigo carmine to 500cc

Endoscopic Resection
Flat serrated lesions

- Cold snare
  - Use stiff snare
  - Caution with grab normal tissue
  - Target 2-3 mm rim
Endoscopic Resection
Flat serrated lesions

- Cold snare
- Hot snare spiral snare
  - Injection lift
  - Remove enbloc if possible

Problem: Snare sliding over polyp
- Cap assisted polypectomy
  - Soft cap Olympus
  - 4 mm beyond end (not EMR cap)
  - Small amount tissue entrapped
  - Use small snare (e.g. BSC 11mm)
Endoscopic Resection
Flat serrated lesions

- Cold snare
- Hot snare spiral snare
- Problem: Snare sliding over polyp
  - Cap assisted polypectomy
- Stay in submucosal plane and maintain cushion
  Inject and reinject!

- Recognize muscularis injury!
Endoscopic Resection
Flat serrated lesions

- Cold snare
- Hot snare spiral snare
- Problem: Snare sliding over polyp
  - Cap assisted polypectomy
  - Stay in submucosal plane and maintain cushion
  - Recognize muscularis injury!
Endoscopic Resection
Flat serrated lesions

- Cold snare
- Hot snare spiral snare
- Problem: Snare sliding over polyp
  - Cap assisted polypectomy
  - Stay in submucosal plane and maintain cushion
  - Recognize muscularis injury!

Large Serrated Polyps

- Most likely to be SSA / P
  - may actually be easier to snare than large flat adenomas
- Submucosal injection sometimes resection more difficult
  - preventing the mucosal wrinkling that facilitates snaring
- No evidence that resection of large serrated lesions
  - increased risk of complications
  - Less attached to the underlying submucosa
drawn into the snare more easily
Endoscopic Resection
Large Serrated Lesions

• When piecemeal
  - Complete snare resection
  - Patience in performance
  
  Reinject to reestablish good submucosal cushion
  Maintain position above muscularis
  Goal is resection not needing ablation
  -Residual edges APC or hot wire tip (cautery)

• When piecemeal
  - Complete snare resection
  - Patience in performance
  - Repeat 3 to 6 months to check for completeness
  - Challenging cases
    - referral more experienced therapeutic colonoscopist
Serrated Polyposis Syndrome (SPS)

- ≥5 serrated polyps proximal to sigmoid colon
  - 2 or more of these being > 10 mm
- Any serrated polyps proximal to sigmoid colon
  - 1st degree relative with SPS
- > 20 serrated polyps of any size
  - distributed throughout colon

Definition is arbitrary cannot be validated without a genotype
No definitive gene mutation to correlate with phenotype

Am J Gastroenterol. 2012;107(9):1315-1329

Serrated Polyposis Syndrome (SPS)

- Substantial phenotypic diversity
- Equal gender distribution
- Median age at diagnosis of 44–62 yrs
  - range 10–90 years

Gut 2010; 59: 1094–100
Dis Colon Rectum 2011; 54: 164–70
Cancer Risk Serrated polyposis (SPS)

- Exact risk unknown
  - Case series up to 25 to 50 % synchronous CRC
  - Retrospective study cumulative 7 % at 5 years

Subject to ascertainment bias risk
Estimates are likely inflated

Surgery and endoscopic surveillance

- Surgery is generally indicated in SPS
  - when CRC is diagnosed or
  - size/number polyps endoscopic control not feasible
- Surgery for patients with SPS should include
  - resection of any segment with cancer
  - segments with large polyps
    - Extended right hemicolecotmy and subtotal colectomy
- Annual endoscopic surveillance
  - residual colon and rectum
Serrated Polyp Surveillance

- Sessile serrated polyp(s) <10 mm with no dysplasia
  5 yrs

- Sessile serrated polyp(s) >10 mm
- Sessile serrated polyp with dysplasia
- Traditional serrated adenoma
  3 yrs

Gastroenterology 2012;143:844–857
Serrated Polyp Surveillance

- Sessile serrated polyp(s) <10 mm with no dysplasia: 5 yrs
- Sessile serrated polyp(s) >10 mm: 3 yrs
- Sessile serrated polyp with dysplasia
- Traditional serrated adenoma: 1 yr
- Serrated polyposis syndrome

Gastroenterology 2012;143:844–857

Key points: Serrated Polyps

- Serrated polyp = Serrated adenoma
Key points: Serrated Polyps

• Serrated polyp Variable w/ or w/o dysplasia

• SSA / P and hyperplastic polyps proximal colon - distinct endoscopic appearance

• Recognize Serrated Polyposis Syndrome

• Endoscopists should measure ADR Serrated target 5% - as check adequate detection of serrated lesions

• Optimize techniques to insure complete resection
Key points: Endoscopy

• All serrated lesions proximal sigmoid colon - should be fully resected during colonoscopy
• All serrated lesions in rectosigmoid colon >5 mm - should be fully resected
• Appropriate colonoscopy surveillance intervals - based on histology

Need for Improving Quality
Serrated polyp/SPS Detection/Resection

Winner of the "Not My Job" Award - ADOT
Litchfield Park, AZ 85
Understanding/Recognizing Risks
Serrated Polyps and SPS

WILLIAM H. HAHN JR.
1905 — 1980
I TOLD YOU I WAS SICK