Sessile serrated lesions of the colon and rectum
Serrated lesions

WHO

• Hyperplastic polyps:
  1. Microvesicular HP (MVHP)
  2. Goblet cell rich HP (GCHP)
  3. Mucin poor HP (MPHP)

Serrated polyps unclassified
• sampling issues
• poor orientation
• insufficient tissue

Sessile serrated adenoma/polyp (SSA/P)

Traditional serrated adenoma (TSA)

Serrated polyposis syndromes
Hyperplastic polyps

• > 75% of all serrated polyps
• Most frequent in distal colon
• Typically sessile/may be multiple (10-20)
• 1-5 mm sized.
• There subtypes.
• Subtypes have demographic and molecular difference

Endoscopy
Small pearl color dew drop like
Normal crypt. Proliferation occurs at the base of the crypts and cells mature toward the lumen (arrow).

Hyperplastic polyp with expanded proliferative zone. Maturation continues toward the lumen with decreased apoptosis creating serrations.
• Elongation of crypt
• Crypts are straight
• Base is narrow
• Proliferation in lower third
• Serration greater at the surface
• Minimal cytological atypia (regenerative)
<table>
<thead>
<tr>
<th>MVHP Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crypt</td>
<td>Straight, serrations towards the lumen</td>
</tr>
<tr>
<td>Proliferation</td>
<td>Uniformly in basal part of crypt</td>
</tr>
<tr>
<td>Cytological dysplasia</td>
<td>No</td>
</tr>
<tr>
<td>Mucin</td>
<td>Microvesicular or mixed microvesicular + goblet cell</td>
</tr>
<tr>
<td>GRHP</td>
<td>features</td>
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<tr>
<td>--------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Crypt</td>
<td>Straight, serration may be minimal</td>
</tr>
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<td>Proliferation</td>
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<tr>
<td>Cytological dysplasia</td>
<td>No</td>
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<tr>
<td>mucin</td>
<td>Pure goblet cell</td>
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</table>

Almost exclusively in left colon
<table>
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<tr>
<td>Crypt</td>
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<tr>
<td>Proliferation</td>
<td>Uniformly in basal crypt</td>
</tr>
<tr>
<td>Cytological dysplasia</td>
<td>Atypia present but uniformly reactive</td>
</tr>
<tr>
<td>mucin</td>
<td>None</td>
</tr>
</tbody>
</table>
• Difference of subtypes lies in demographics and molecular levels
• No clinical significance between different subgroup of HP
• Reporting subtypes is optional
Sessile serrated adenoma/ polyps (SSA/P)

- In the proximal colon.
- 15-25% of all serrated lesions.
- 50% >5 mm, 15-20% are >10 mm.
- Precursors to carcinoma with MSI and CpG island methylated MSS carcinoma.
• **Endoscopy**
• flat to sessile with smooth surface
• Covered with mucus giving a yellow color initially.
• Once mucus is washed off the underlying polyps may be similar in color to adjacent mucosa or have a reddish appearance.
• Proliferative zone is on one side, asymmetric and variable from crypt to crypt
• Dilated near the base
• Serration at the base of the crypt.
• Abnormal shapes (L-shape, inverted T-shapes)
• No cytological dysplasia
- Ki67 show abnormal proliferation and goblet cells or gastric foveolar differentiation at base of crypt.
If >2/3 contiguous crypt demonstrate features of SSA/P the lesions should be classified as SSA/P.
SSA/P with cytological dysplasia progression towards carcinoma.

- Dysplasia resembling conventional adenoma.
- Narrow, elongated hyperchromatic nucleus and basophilic cytoplasm.

Serrated dysplasia
- Cuboidal cells
- Vesicular nucleus with prominent nucleoli
- Eosinophilic cytoplasm
Traditional serrated adenoma (TSA)

- Least common.
- In distal colon.
- Precursors
- Endoscopy
- reddish and more protruberant than SSA/P.
• Complex and villiform growth pattern
• Lining cells, often referred to as “dysplastic” cell.
• Tall columnar cells with a penicillate nucleus and eosinophilic cytoplasm.
• Senescent cells
• Ki67, no proliferation

Defining feature, ectopic crypt (proliferative zone)
Normal crypt

Early stage of TSA with proliferative zone on side of crypt. Outward growth creates ectopic crypt (arrow)

Fully developed TSA with multiple ectopic crypts lining villi
Tall columnar cells with penicillate nuclei and eosinophilic cytoplasm
Progression towards carcinoma......

• TSA with conventional dysplasia or serrated dysplasia.
Serrated polyposis

WHO criteria:

• ≥5 serrated polyps, proximal to sigmoid colon, ≥2 being ≥10 mm

• Any number of serrated polyps, proximal to sigmoid colon, any size, in an individual with first degree relative with serrated polyposis syndrome

• ≥20 serrated polyps, of any size, throughout the colon
• In males and females at any age.
• Asymptomatic
• Two clinical variants
• Type 1: multiple SSA/P, larger and more proximal. Risk of cancer is high
• Type 2: small (5 mm or >) classic HP throughout the colon. Cancer risk is less
Carcinogenesis of serrated lesions
Mutations involved

- BRAFT
- KRAS
- MLH1
- CpG Hypermethelation
Reference

• WHO classification of tumors of the digestive system, 4th edition.

• Article on “An approach to the diagnosis and classification of serrated polyps” by prof. Janaki Hewavisenthhi.

• Article on Arch pathol Lab Med “Molecular and histological consideration in the assessment of serrated polyps” by Hui-Min Yang, James M et al, vol 139, june 2015
THANK YOU