**Colon Polyps**

### Adenoma

“**Picket fence**” nuclei: Elongated, Pencillate, pseudostratified, hyperchromatic
Nuclei retain basal orientation (bottom 1/2 of cell)
Low grade dysplastic changes should involve at least the upper half of the
crypts and the luminal surface

<table>
<thead>
<tr>
<th></th>
<th>Tubular</th>
<th>Tubulovillous</th>
<th>Villous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tubules</td>
<td>&gt;75%</td>
<td>25-75%</td>
<td>&lt;25%</td>
</tr>
<tr>
<td>Villi</td>
<td>&lt;25%</td>
<td>25-75%</td>
<td>&gt;75%</td>
</tr>
</tbody>
</table>

**High-grade dysplasia** (“carcinoma in situ”)
Significant cytologic pleomorphism
- Rounded, heaped-up cells, ↑ nuclear:cytoplasmic ratio
- Nuclei: “Open” chromatin, prominent nucleoli
- Lose basal orientation, extend to luminal half of cell

**Architectural complexity**
- Cribriforming, solid nests, intraluminal necrosis
- Absence of definite breach of basement membrane

**Intramucosal Carcinoma**
Neoplastic cells through basement membrane
Into lamina propria but not through muscularis mucosae
- Single cell infiltration, small and irregular/angulated tubules
- Marked expansion of back-to-back cribriform glands
No metastatic risk (paucity of lymphatics in colonic mucosa)

Invasion into submucosa → implied by Desmoplastic response

Mutation Pathway: **APC → KRAS → p53**  (also often β-Catenin and SMAD4)

### Serrated Polyps

**Hyperplastic polyp (HP):** Mucosal outgrowth characterized by
elongated crypts lined by **nondysplastic epithelium** with surface papillary infoldings → serrated luminal contour

**Sessile serrated adenoma (SSA) and sessile serrated polyp (SSP)**
Usually large (≥1 cm) sessile right sided lesions
Architectural disturbances at the bases of crypts is required
- Marked dilation of crypts with flattened, horizontal bases
Number of crypts required for the diagnosis is controversial
- The WHO requires at least three adjacent abnormal crypts
- A consensus conference recommends a single abnormal crypt
The majority of crypts lack the uniform pattern of proliferative bases

<table>
<thead>
<tr>
<th>Size of polyp</th>
<th>Left Colon</th>
<th>Right Colon</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 mm</td>
<td>Vast majority HP</td>
<td>Mix of SSA and HP</td>
</tr>
<tr>
<td>6-9 mm</td>
<td>Mix of SSA and HP</td>
<td>Vast majority SSA</td>
</tr>
<tr>
<td>10+ mm</td>
<td>Vast majority SSA</td>
<td>Essentially all SSA</td>
</tr>
</tbody>
</table>

Mutation Pathway: **Microsatellite instability (MLH1, MSH2, MSH6, or PMS2)**
**Peutz-Jeghers Polyp**

- **Hamartomas** (non-neoplastic)
- Mutation in the STK11/LKB1 gene.
- Most frequent in small intestine
- **Multilobated**, may have papillary or frond-like surface
- **Arborizing smooth muscle**
- Generally cytologically bland epithelium
- **Mucocutaneous melanotic macules** (lips and oral mucosa)
- Increased risk of many cancers
  
  (e.g., Stomach, Colon, Pancreas, Breast, etc...)

**Juvenile Polyp**

- Common in **children**, but may occur at any age
- Usually **smoothly spherical** pedunculated polyp
- Prominent **cystically dilated glands**
- Abundant **inflamed stroma**
- Surface may be eroded
- Dysplasia and carcinoma are very rare in sporadic polyps
- ≥5 polyps or extra-colorectal location may indicate Juvenile Polyposis syndrome

**Prolapse Polyp**

- Changes may be seen secondary to rectal mucosal prolapse
  
  Often anterior rectal wall within 12 cm of anal verge
- Superficial ulceration or **erosion** of mucosa
- Thickened, disorganized muscularis mucosae with extension into lamina propria → **Smooth muscle surrounds individual crypts**
- **Regenerating** mucosal epithelium may appear adenomatous
- **Distorted crypts**, sometimes diamond-shaped

**Traditional Serrated Adenoma**

- Prominent **serration** of glands
- Columnar cells with mucin-depleted, **eosinophilic cytoplasm**
- **Cytologic low grade dysplasia** throughout
  
  Hyperchromatic elongate nuclei
  
  Frequent nuclear stratification
- Complex architecture with **ectopic crypt formation**
- Often pedunculated and left sided