Detection and removal of flat polyps, large polyps and ugly polyps

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Objectives and Disclosures

• Objectives
  – Discuss the terminology used in describing colorectal polyps and the risk of submucosal invasion of malignancy
  – Review the techniques for endoscopic management of difficult polyps
  – Review the management of polypectomy complications

• Disclosures related to this lecture
  – Grant and research support: Olympus, Cook Medical
  – Consultant: Boston Scientific, Olympus
Detection and removal of flat polyps, large polyps and ugly polyps

- Assess the lesion
  - It is all about the prep
  - Risk of submucosal invasion
  - Which lesions to avoid

- Resection techniques: evidence based
  - Submucosal injection/Piecemeal resection
  - Techniques, devices evidence based approach
  - Margin treatment/Recurrence

- Recognizing and managing complications
  - Perforation: target sign, endoscopic closure
  - Bleeding: active and visible vessel treatment

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Polyp characterization

- Use the language
- Granular is “good”
- Depression is “bad”
- Pit patterns are complicated
Granular is Good

• Granular = Good

• Non Granular = bad

Depression is Bad
Kudo’s Pit Pattern

- **HYPERPLASTIC**
  - Type I: Rond pit (normal pit)
  - Type II: Acantholitic pit

- **ADENOMATOUS**
  - Type III: Tubular or columnar pit that is wider than the normal pit
  - Type III*: Tubular or columnar pit that is deeper than the normal pit

- **CANCEROUS**
  - Type IV: Dysplastic or granular pit
  - Type V: Irregular arrangement and deep or flat, III, IV type pit pattern
  - Type V*: Anomalous or non-structured pit pattern

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**Endoscopic Mucosal Resection Outcomes and Prediction of Submucosal Cancer From Advanced Colonic Mucosal Neoplasia**

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- Prospective Study
- 479 lesions > 20mm
- 7 Australian Centers
### Lesion characteristics and percentage with submucosal invasion

<table>
<thead>
<tr>
<th>Classification</th>
<th>n</th>
<th>% of total cohort</th>
<th>N(%) with P value</th>
</tr>
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<tbody>
<tr>
<td>Is</td>
<td>146</td>
<td>30.5</td>
<td>11 (7.5%)</td>
</tr>
<tr>
<td>IIa</td>
<td>222</td>
<td>46.3</td>
<td>9 (4.1%)</td>
</tr>
<tr>
<td>IIb</td>
<td>9</td>
<td>1.9</td>
<td>1 (11.1%)</td>
</tr>
<tr>
<td>IIc or IIa+c</td>
<td>22</td>
<td>4.6</td>
<td>7 (31.8%)</td>
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<tr>
<td>Is+IIa</td>
<td>80</td>
<td>16.7</td>
<td>5 (6.3%)</td>
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<table>
<thead>
<tr>
<th>Surface morphology</th>
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<tbody>
<tr>
<td>Granular</td>
<td>311</td>
<td>64.9</td>
</tr>
<tr>
<td>Non-Granular</td>
<td>98</td>
<td>20.5</td>
</tr>
<tr>
<td>Mixed granular and non-granular</td>
<td>30</td>
<td>6.3</td>
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<tr>
<td>Unable to classify</td>
<td>40</td>
<td>8.4</td>
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<table>
<thead>
<tr>
<th>Kudo Pit Pattern</th>
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<tbody>
<tr>
<td>Pit pattern I</td>
<td>7</td>
<td>1.5</td>
</tr>
<tr>
<td>Pit pattern II</td>
<td>41</td>
<td>8.6</td>
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<tr>
<td>Pit pattern III</td>
<td>182</td>
<td>38.0</td>
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<tr>
<td>Pit pattern IV</td>
<td>202</td>
<td>42.2</td>
</tr>
<tr>
<td>Pit pattern V</td>
<td>25</td>
<td>5.2</td>
</tr>
</tbody>
</table>

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### Size

- Larger polyps harder to resect
  - More time
  - Risk of residual tissue
  - Higher complications?
Detection and removal of flat polyps, large polyps and ugly polyps

- Assess the lesion  When not to Resect
  - Is it a cancer
  - Is there a significant risk of submucosal invasion
    - Non-lifting sign
  - Is this too large for me to resect
    - Individual decision
  - Is the patient prepared for a large resection
    - Consent
    - Prep
    - Coagulation issues
    - Medical stability for complications
Detection and removal of flat polyps, large polyps and ugly polyps

• Equipment and Staff
  – Endoscope selection
    • Colon, pediatric colon, upper scope
    • Single channel double channel
    • Water irrigation
  – Cap
    • May improve polyp detection and time to cecum
    • Useful for flat polyp and polyp manipulation at resection


Difficult Locations

• Use of retro flexion to assess polyp before resection
  – PCF or upper scope if in left colon if needed
  – Inject and resect in retro flexion if visualization is improved
• Use submucosal injection to visualize polyps behind a fold
Retro flexion for polypectomy

Detection and removal of flat polyps, large polyps and ugly polyps

- Equipment and Staff
  - Injection material
    - Most labs still use saline tinted with dye
      - Methylene blue
      - Indigo carmine
    - Other agents popular for “longer lift”
      - Succinylated gelatin (RCT shows increase en bloc resection size and decreased time¹)
      - Hetastarch available in USA and effective²
      - Methyl cellulose “liquid tears”
      - Hyaluronic acid (expensive)

¹Moss A, et al. AJG 2010;105: 2375-2382
Dynamic Submucosal Injection Technique

Saline lift polypectomy

Standard saline injection
Dynamic Injection Technique
engage needle and then move needle with large volume rapid injection
Courtesy Soetikno and Kaltenbach
Detection and removal of flat polyps, large polyps and ugly polyps

• Equipment
  – Snares
    • Stiff snares
    • Small snares
    • Specialty snares
  – Hemostatic clips
  – Endoloop
• Consider an advanced polypectomy kit
  – Specialty snares and all other accessories for large polyp removal in one box to move from room to room in your lab.

Detection and removal of flat polyps, large polyps and ugly polyps

• Equipment
  – Electrosurgical generator with APC
    • Coagulation vs. cut vs. automated cut cycle
    • APC for ablation of margins bleeding and visible vessels
      – RCT trial underway in Australia
    • Soft coagulation for control of bleeding
      – From ESD experience
  – CO2
    • Reduced discomfort
    • Reduced admissions post large resections*

Bassan MS, Bourke Mk et al UGEW 2011 abstract 5287
Argon Plasma Coagulation of large polyp resection margins decreases recurrence of adenoma in follow up

Brooker et al. *Gastrointestinal Endoscopy Volume 55, No. 3, 2002*)
RCT in progress

Detection and removal of flat polyps, large polyps and ugly polyps

- **Staff**
  - Skilled assistants
    - Staff education with devices and techniques is key
  - Sedation nurse / anesthesia
    - Well sedated patients seem preferable
    - Little data available
Pedunculated polyps should not be difficult

- Inject stalk with epinephrine to reduce size*
- Excision at or near wall of colon with coagulation current
- Use of an endoloop
- Clipping of stalk to prevent rebleeding

*Hogan RB and Hogan RB, GIE 2007;66:1018-1022

A detachable loop ligating device
Endoloop stalk ligation prior to polypectomy

Pedunculated polyp

Endoloop in place

Loop tightened and released

Snare transection above loop

Images courtesy of Dr. R. Soetikno

Large polyps

• Delineate margin
• Saline elevate especially the center of the lesion
• Piecemeal polypectomy take small bites
• Reinject if necessary
Large polyps

Flat polyps
Paris II-a granular
Difficult Polyp managing complications

- Bleeding
  - Coagraper/hot bx forceps: coaptive coagulation
  - APC for visible vessels
  - Clips
- Perforations
  - Clips
  - OTSC

Assessing the resection site for perforation

- Careful examination to detect perforation
- “Target sign” on resected polyp
- “Reverse target sign” at the resection site

Swan, Bourke et al GIE 2011;73:79-85
Clip closure of perforations

- Minimize insufflation (CO2 is preferred)
- Visualize extent of perforation
- Clip deeply from one margin to the other
- Multiple clips closely spaced
- Use of OTSC reported
- Admit patient for serial exams, IV antibiotics and surgical consultation

Clips for resection site closure
Over the scope clip (OTSC) system for treatment of GI bleeding and perforation

Kirschniak, Andreas et al. GIE 2007; 66:162-167

OTSC clip closure of perforation

Kirschniak A et al. GIE 2007; 66:162-167
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• Recognizing and managing complications
  – Perforation: target sign endoscopic management
  – Bleeding: active and visible vessels: endoscopic therapy

Thank you!

Washington University School of Medicine Interventional Endoscopy Section

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