



# Keys to Successful Polypectomy

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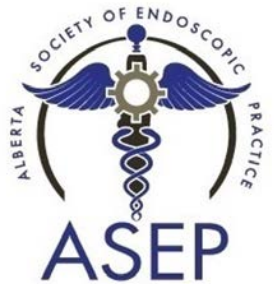
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# Endo Skills 2024

## Disclosure of Commercial Support

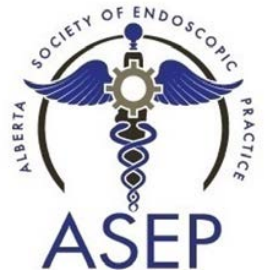
- ▶ Endo Skills is presented by the Alberta Society for Endoscopic Practice (ASEP)
- ▶ ASEP: not for profit organization, whose goal is to provide education, resources and collaboration for endoscopists and their teams
- ▶ Endo Skills planning is independent from the exhibitors
- ▶ ASEP covers expenses of speakers and provides gift+/- small honorarium to speakers and planning committee



# Endo Skills 2024

## Managing Sources of Potential Conflict

- ▶ Endo Skills Planning Committee: oversees the program's content development to ensure accuracy and balance.
- ▶ Information and recommendations are evidence and/or guidelines-based, and opinions of the independent speakers will be identified as such.
- ▶ Program developed in accordance to ethical standards meeting Cert+ guidelines.



# Endo Skills 2024: Presenter Disclosure

- ▶ **Presenter:** Kirles Bishay
- ▶ **Relationships that may introduce potential bias and/or conflict of interest:**
  - **Grants/Research Support:** None
  - **Speakers Bureau/Honoraria:** None
  - **Consulting Fees:** None
  - **Other:** Employee AHS, University of Alberta

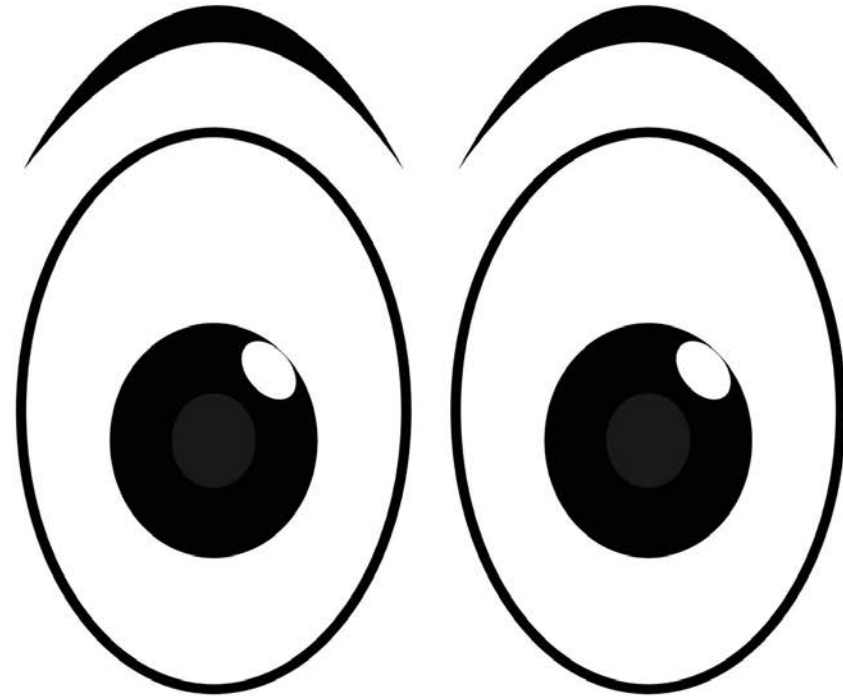
# Objectives

- ▶ Review the evaluation of endoscopic lesions
- ▶ Recognize personal limitations of endoscopy and polypectomies and when to consider referring to advanced endoscopist
- ▶ Understand endoscopic techniques to ensure best outcomes possible: positioning of lesion, pre-polypectomy treatment
- ▶ Review potential complications of polypectomies: including referring to Sydney classification of post polypectomy injuries

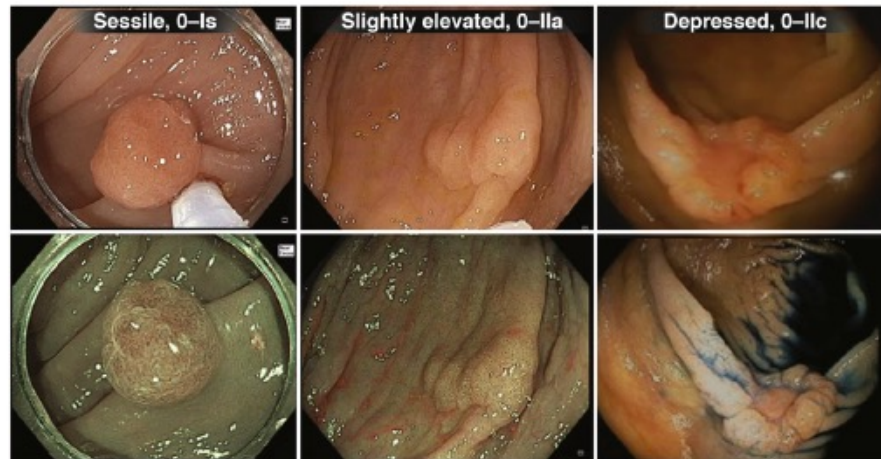
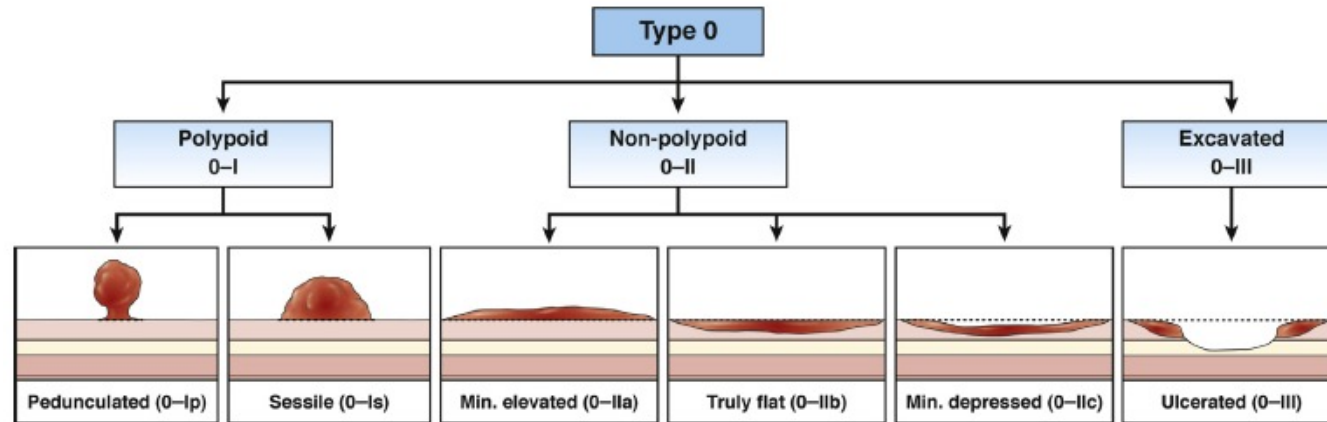
# Look at the Lesion!

Evaluation of polyp

- ▶ Location
- ▶ Size
- ▶ Morphology
- ▶ Pit Pattern

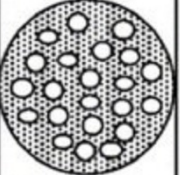
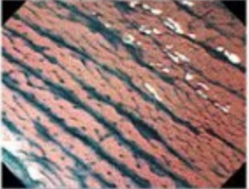
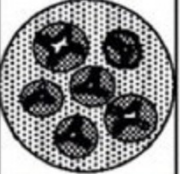

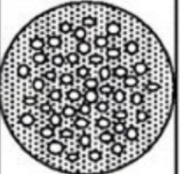











# Paris Classification



➔ Risk of SMI

# Kudo Classification

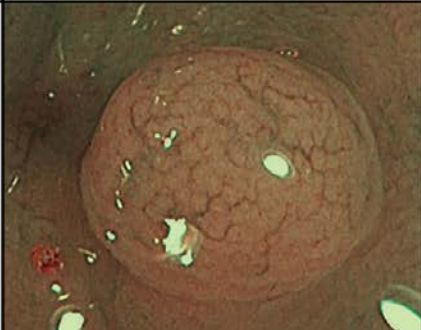
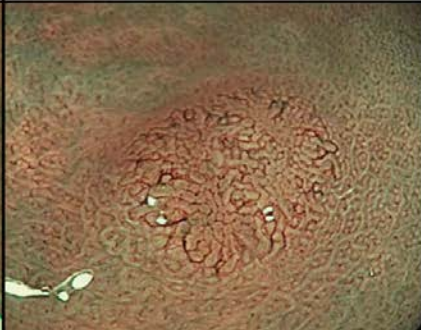
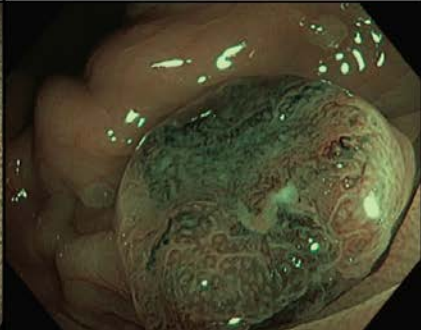
Type	Schematic	Endoscopic	Description
I			Round pits.
II			Stellar or papillary pits.
III <sub>s</sub>			Small tubular or round pits that are smaller than the normal pit
III <sub>L</sub>			Tubular or roundish pits that are larger than the normal pits.

IV			Branch-like or gyrus-like pits.
V <sub>i</sub>			Irregularly arranged pits with type III <sub>s</sub> , III <sub>L</sub> , IV type pit patterns.
V <sub>ii</sub>			Non-structural pits.

INVASIVE

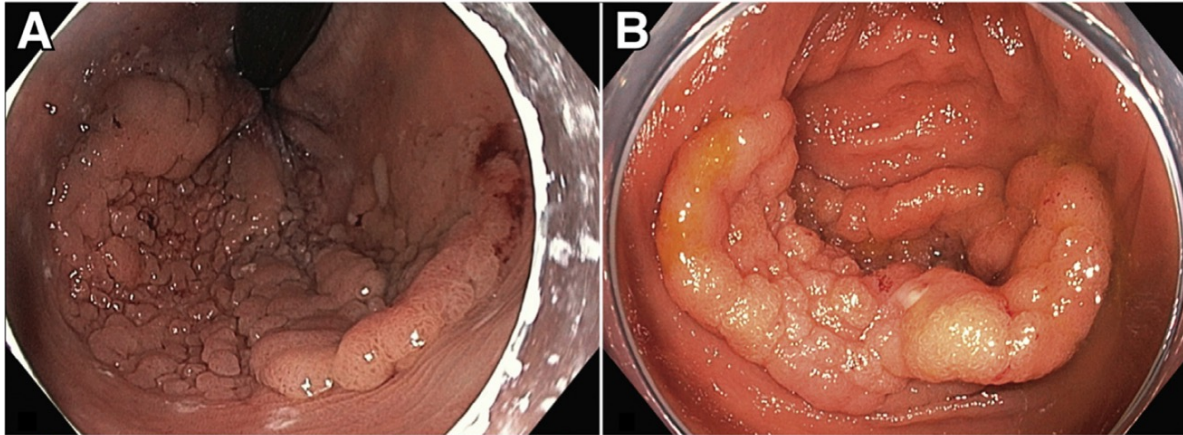


# NICE Classification

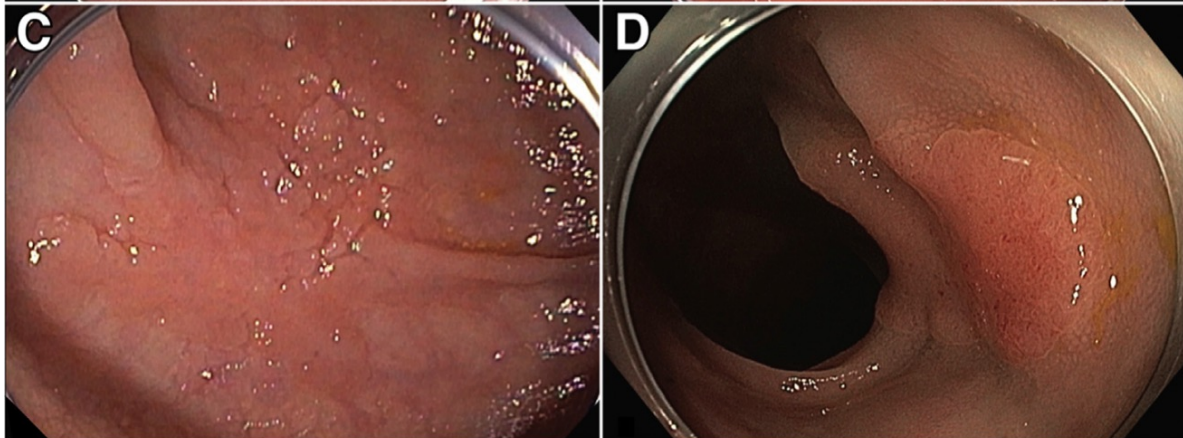
	Type 1	Type 2	Type 3
Color	Same or lighter than background	Browner relative to background (verify color arises from vessels)	Brown to dark brown relative to background; sometimes patchy whiter areas
Vessels	None, or isolated lacy vessels may be present coursing across the lesion	Brown vessels surrounding white structures**	Has area(s) of disrupted or missing vessels
Surface pattern	Dark or white spots of uniform size, or homogeneous absence of pattern	Oval, tubular, or branched white structures** surrounded by brown vessels	Amorphous or absent surface pattern
Most likely pathology	Hyperplastic and sessile serrated lesions***	Adenoma****	Deep submucosal invasive cancer
			

# Laterally spreading lesions- granularity

Granular



Non-Granular



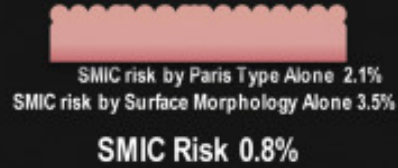
Risk of SMI

# Risk of Occult Submucosal Invasive Cancer (SMIC) According to Gross Morphology and Location n = 1712



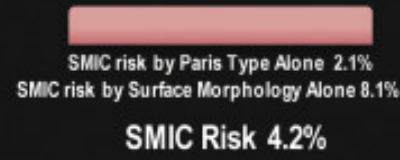
A typical proximally located 0-IIa Granular Lesion.  
Overall risk of SMIC 0.7%

## 0-IIa G

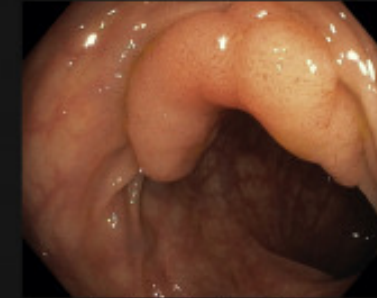


Proximal 0.7% **Very Low Risk**  
Distal 1.2% **Low Risk**

## 0-IIa NG

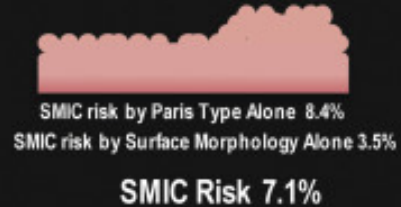


Proximal 3.8%  
Distal 6.4%



A proximal 0-IIa Non-Granular Lesion.  
Overall risk of SMIC 3.8%

## 0-IIa+Is G



Proximal 4.2%  
Distal 10.1%

## 0-IIa+Is NG



Proximal 12.7% **High Risk**  
Distal 15.9% **High Risk**

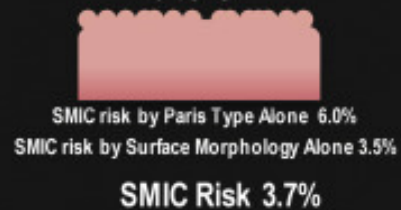


A distal (distal) 0-IIa+Is Granular Lesion.  
Overall risk of SMIC 10.1%



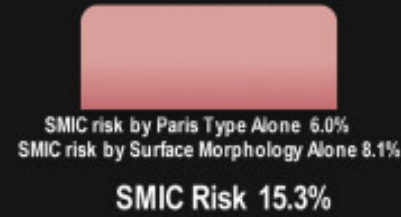
A transverse colon (proximal) 0-IIa+Is Non-Granular Lesion.  
Overall risk of SMIC 12.7%

## 0-Is G

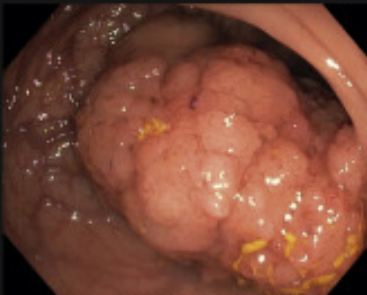


Proximal 2.3% **Low Risk**  
Distal 5.7%

## 0-Is NG



Proximal 12.3% **High Risk**  
Distal 21.4% **Very High Risk**



A sigmoid colon (distal) 0-Is Granular Lesion.  
Overall risk of SMIC 5.7%



An ascending colon (proximal) 0-Is Non-Granular Lesion.  
Overall risk of SMIC 12.3%

Burgess NG et al. Risk Stratification for Covert Invasive Cancer Among Patients Referred for Colonic Endoscopic Mucosal Resection: A Large Multicenter Cohort. *Gastroenterology*. 2017 Sep;153(3):732-742.e1.

# Consider referral to advanced endoscopist

- ▶ Appendiceal orifice → Difficult to lift!
  - ▶ Ideally want to see all margins of polyp to ensure removal
    - ▶ Lesions encompassing >50% circumference of AO predict incomplete removal
- ▶ IC valve involvement
  - ▶ Higher rates of recurrence post EMR (OR 3.4)
- ▶ Anorectal junction
  - ▶ Unique sensory and lymphovascular anatomy
- ▶ Difficult position → distal ascending, behind large folds
- ▶ **Any polyp you are not comfortable with (especially  $\geq 2$  cm!)**

# Consider Referral to Advanced Endoscopist

- ▶ Appendiceal orifice → Difficult to lift!
  - ▶ Ideally want to see all margins of polyp to ensure removal
    - ▶ Lesions encompassing >50% circumference of AO predict incomplete removal

## Statement 6: Quality of polypectomy

The majority of benign colorectal lesions can be safely and effectively removed using endoscopic techniques. As such, endoscopy should be the first-line management of benign colorectal lesions.

- When an endoscopist encounters a suspected benign colorectal lesion that he or she is not confident to remove completely, we recommend referral to an endoscopist experienced in advanced polypectomy for subsequent evaluation and management, in lieu of referral for surgery. (Strong recommendation, low-quality evidence)

- ▶ Difficult position → distal ascending, behind large folds
- ▶ **Any polyp you are not comfortable with (especially  $\geq 2$  cm!)**

# Size (and Technique) Matters!

## Regular colonoscopy with polypectomy

### Bleeding

- ▶ Pooled prevalence post-polypectomy bleeding (PPB) rate of 9.8/1000 (95% CI, 7.7–12.1)
- ▶ Time-trend analysis show PPB declined from 6.4 to 1.0/1,000 colonoscopies from 2001 to 2015

### Perforation

- ▶ 0.08% (95% CI, 0.06%–0.1%)

## EMR of LSL >20 mm

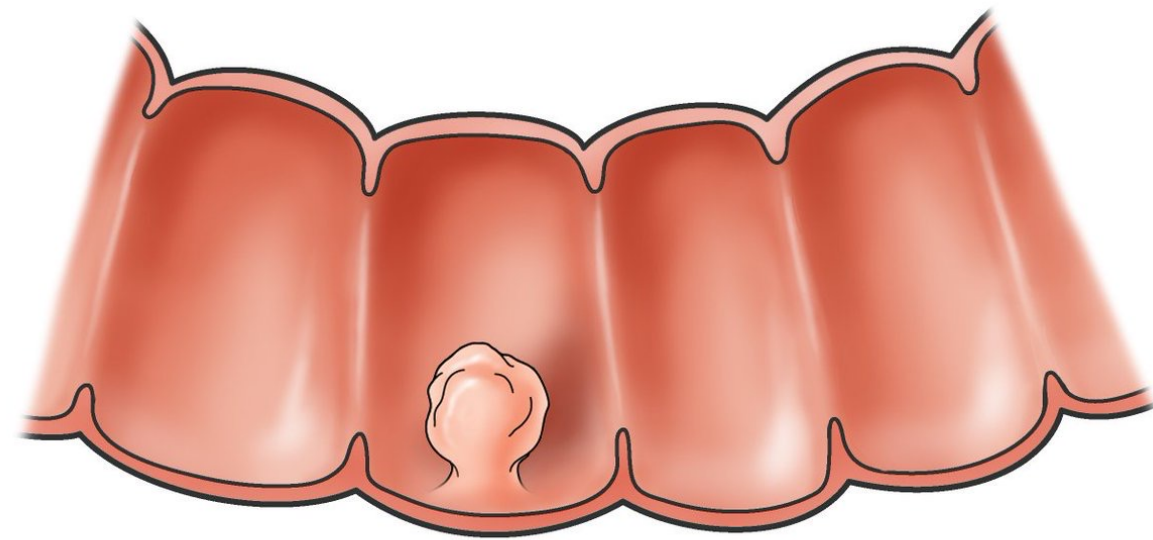
### Bleeding

- ▶ Approximately **3-10%** (depending on size and location)
- ▶ Can be decreased in certain situations

### Perforation

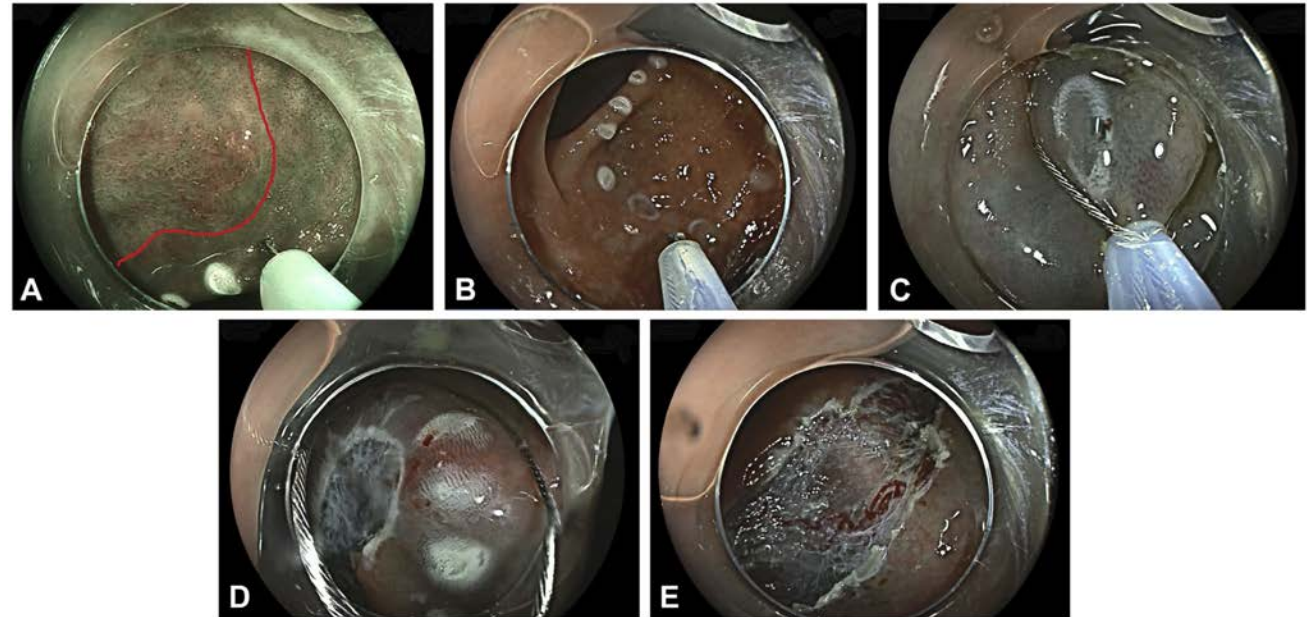
- ▶ MA of 50 studies that included 6779 colorectal lesions  $\geq 20$  mm → **1.5%** (95% CI, 1.2%–1.7%)

# Optimizing Removal



# Marking the Edges

- ▶ Small cautery marks just outside the edge of the polyp, small margin of normal tissue
- ▶ Single-center historical control study of EMR cases
  - ▶ Polyps with marked edges → less recurrence at 6 months compared to historical controls (8% vs. 29%,  $p < 0.001$ )



Yang D *et al.* Margin marking before colorectal endoscopic mucosal resection and its impact on neoplasia recurrence (with video). *Gastrointest Endosc.* 2022 May;95(5):956-965. doi: 10.1016/j.gie.2021.11.023.



# Lifting LSLs

## Lifting agent

- Saline+dye (methylene blue, indigo carmine) vs **long-acting solution**
- +/- epinephrine (1:20,000 or 1:100,000)

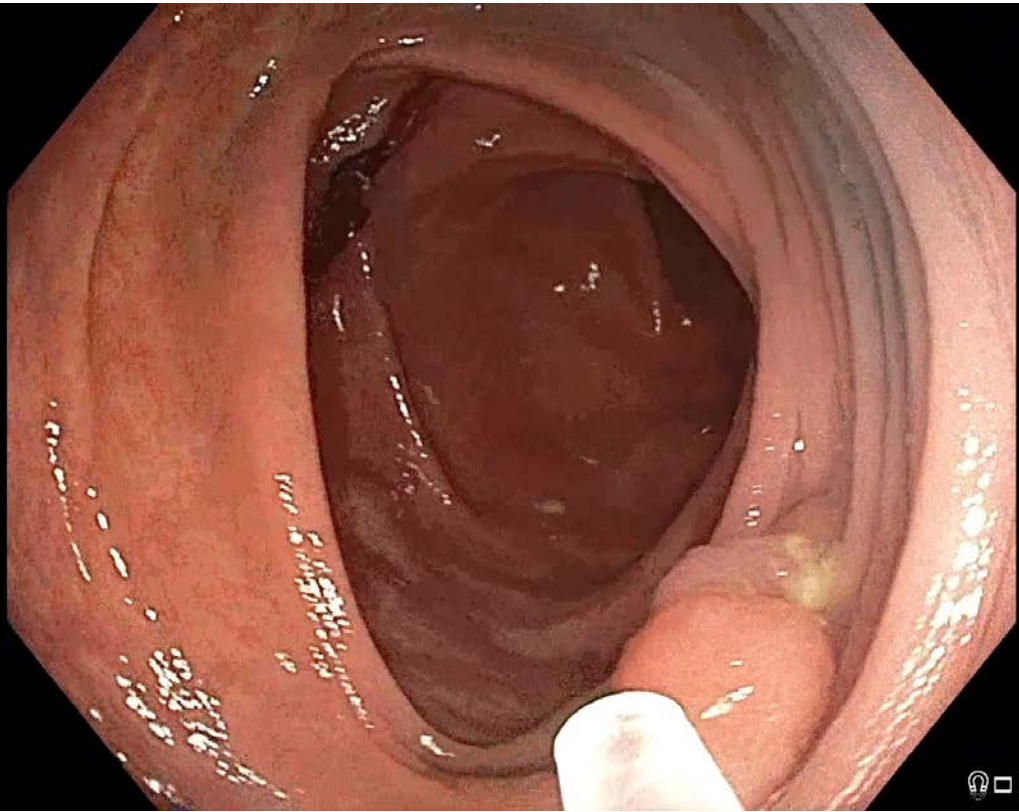
## Where to start

- Dynamic lifting is key!
- Proximal (upstream) side of polyp to lift **towards** scope of view

## Communication

- Needle in/out
- Inject
- Verbal feedback from assistant (echo needle order, call out each cc during injection/amount of resistance)

# Injection technique



- ▶ Use small syringe (easier to push for viscous solutions)
- ▶ Prime the needle
- ▶ Angle the needle 30-45 degrees
- ▶ Start injecting just before contacting mucosa
- ▶ Depth of needle- While injecting, advance the need just until SM dissection begins then stop
- ▶ Constant reassessment of lift/depth/angle as bleb rises
- ▶ How much?
  - ▶ Just until the cushion passes polyp edge→ too much makes the edges of flat polyps hard to grasp
- ▶ Multiple injections for EMR

# Resection

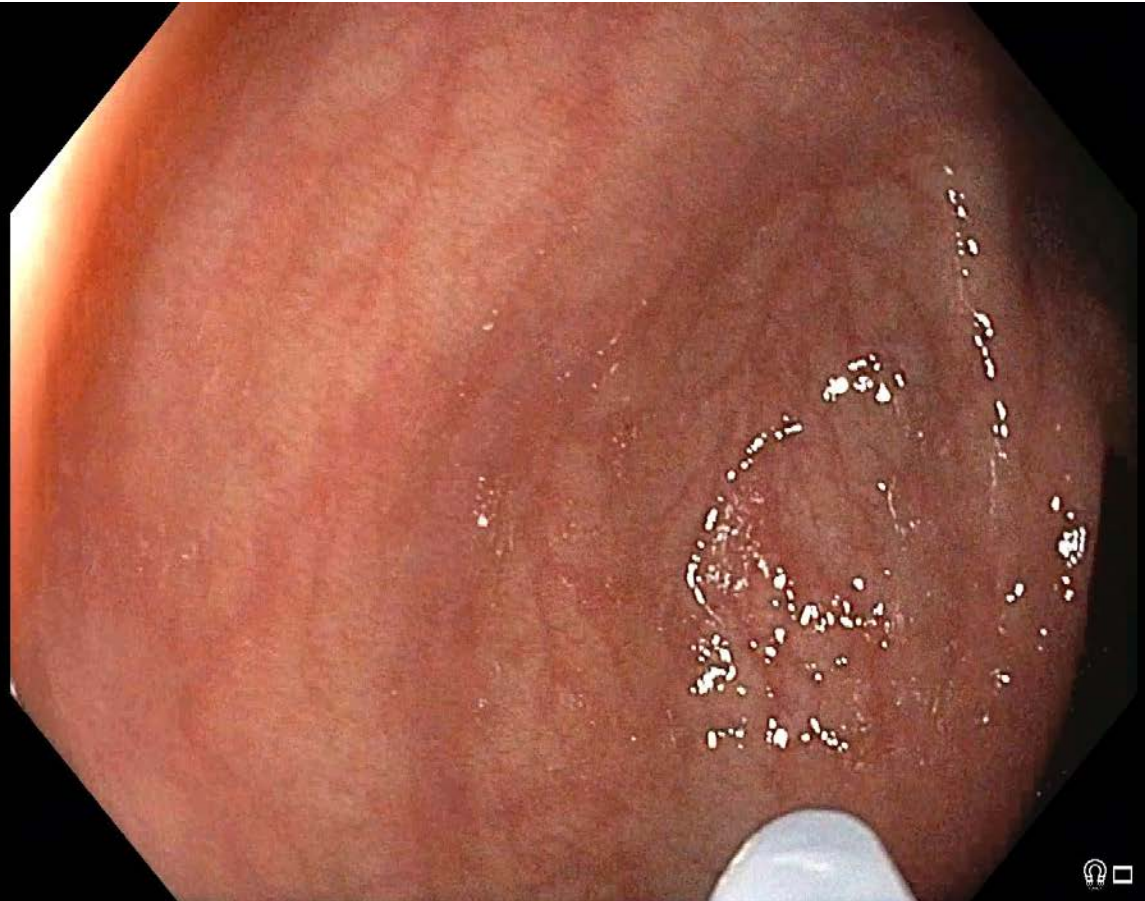
## Snare selection

- Stiff braided snare for flat polyps
- Not too big (risk of grabbing MP, ↑risk of perforation)

## Generator setting

- Pure Coagulation: ↓immediate bleeding, ↑delayed bleeding
  - May not cut easily through thick amount of tissue
- Pure Cut: ↑immediate bleeding, ↓delayed bleeding
- Blended current hybrid of cut/coag settings → Mixture of risks/ benefits of each
  - Endocut Q on Erbe

# Resection Technique



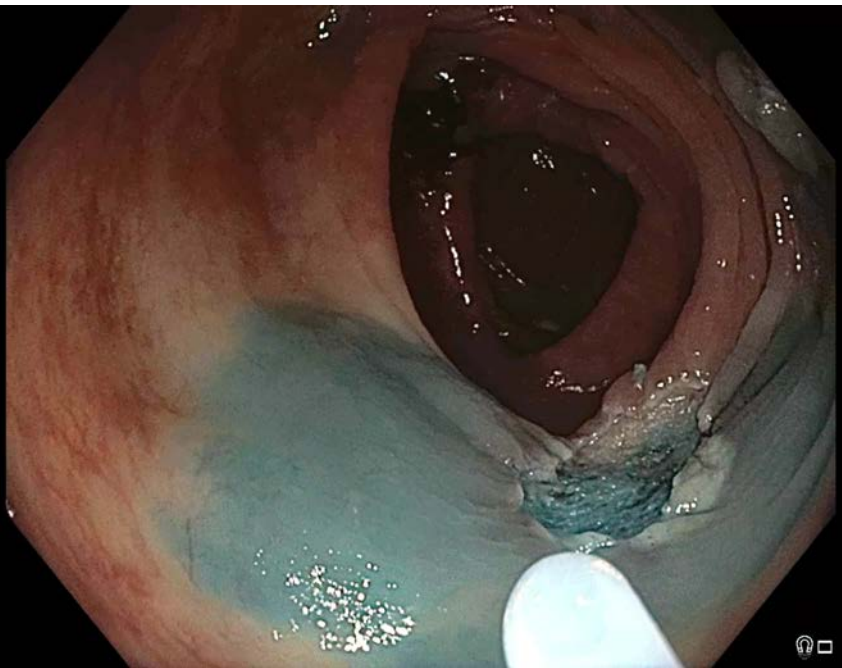
Systematic approach- don't start in the middle, don't leave islands

Should be able to close the snare fully with <1 cm between thumb and fingers

Lift away from colon wall

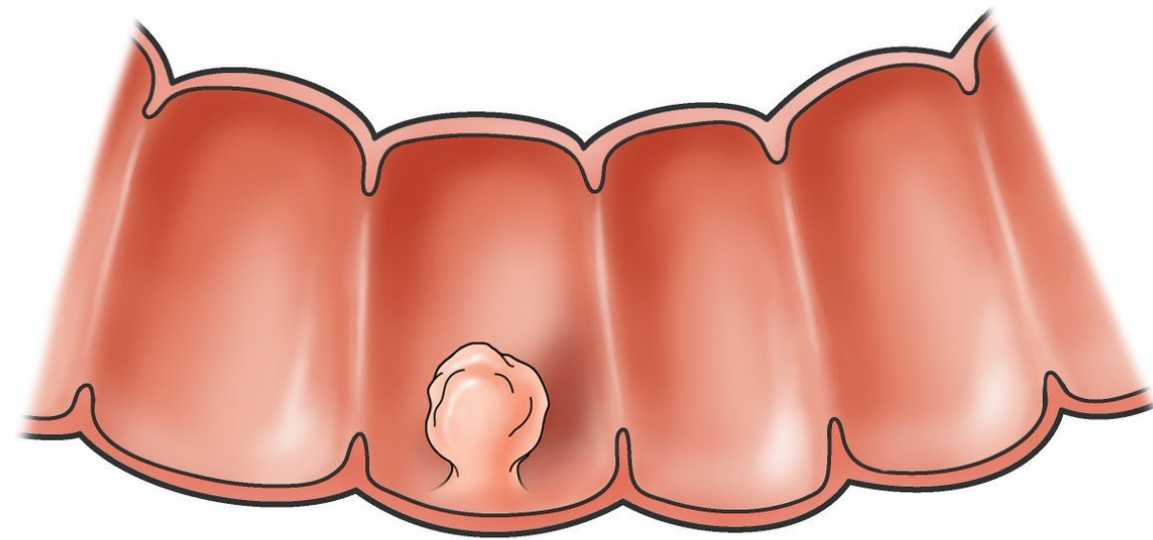
Relatively fast transection speed (between 1-3 pulses)

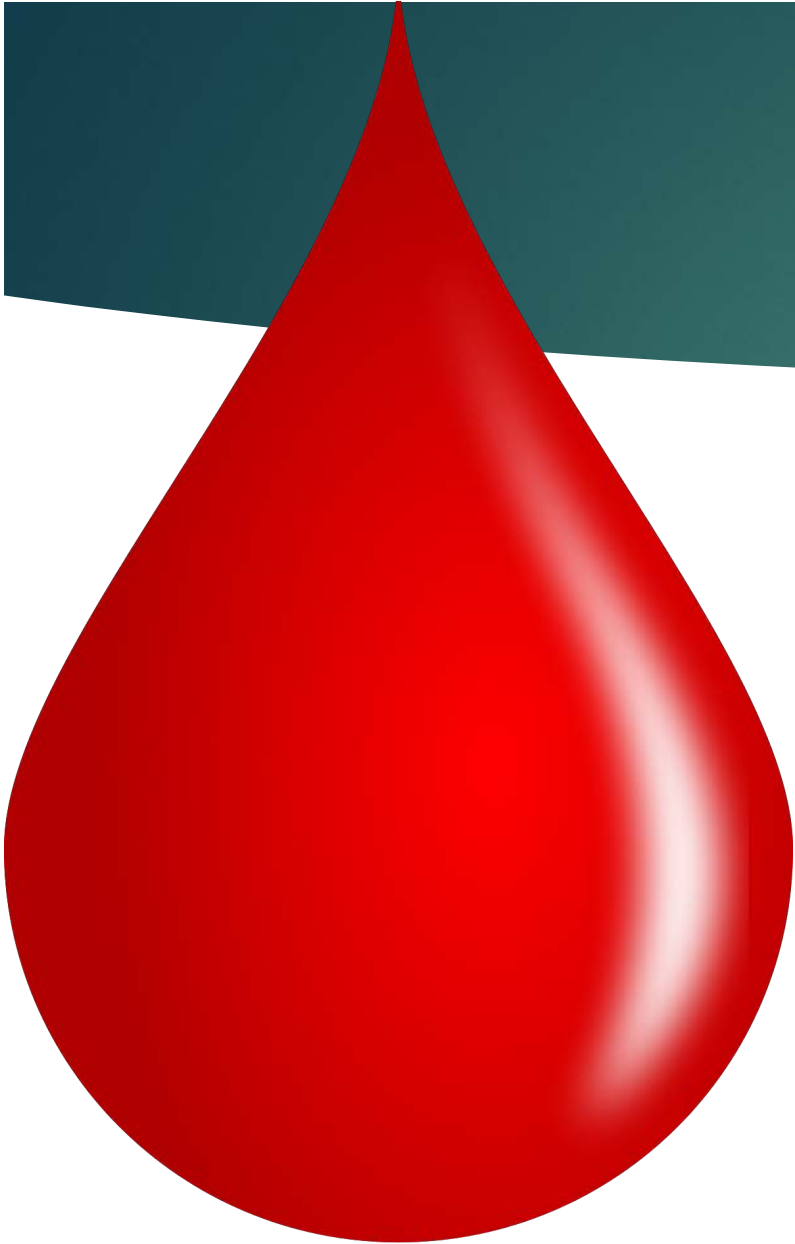
# Ablation of the edges



- Snare tip soft coagulation → Snare tip treatment using Erbe SOFT COAG setting until a few millimeters of normal tissue at the margin turns white
- Klein *et al.* RCT of 390 LSTs >20 mm
  - STSC or no treatment
  - At first follow-up, recurrence rate in treatment group 5.2% vs. 21% in control group
  - Lesions 40 mm or larger had recurrence rates of 3.3% and 36.4%, respectively

# Complications: Prevention and Treatment





Bleeding

# Pedunculated polyps- Which ones will bleed?

## General Approach

- ▶ <10mm → Cold snare
- ▶ >10mm → Recommend removal with electrocautery
- ▶ Transection at the **middle to lower stalk** for adequate specimen for histologic assessment of stalk invasion

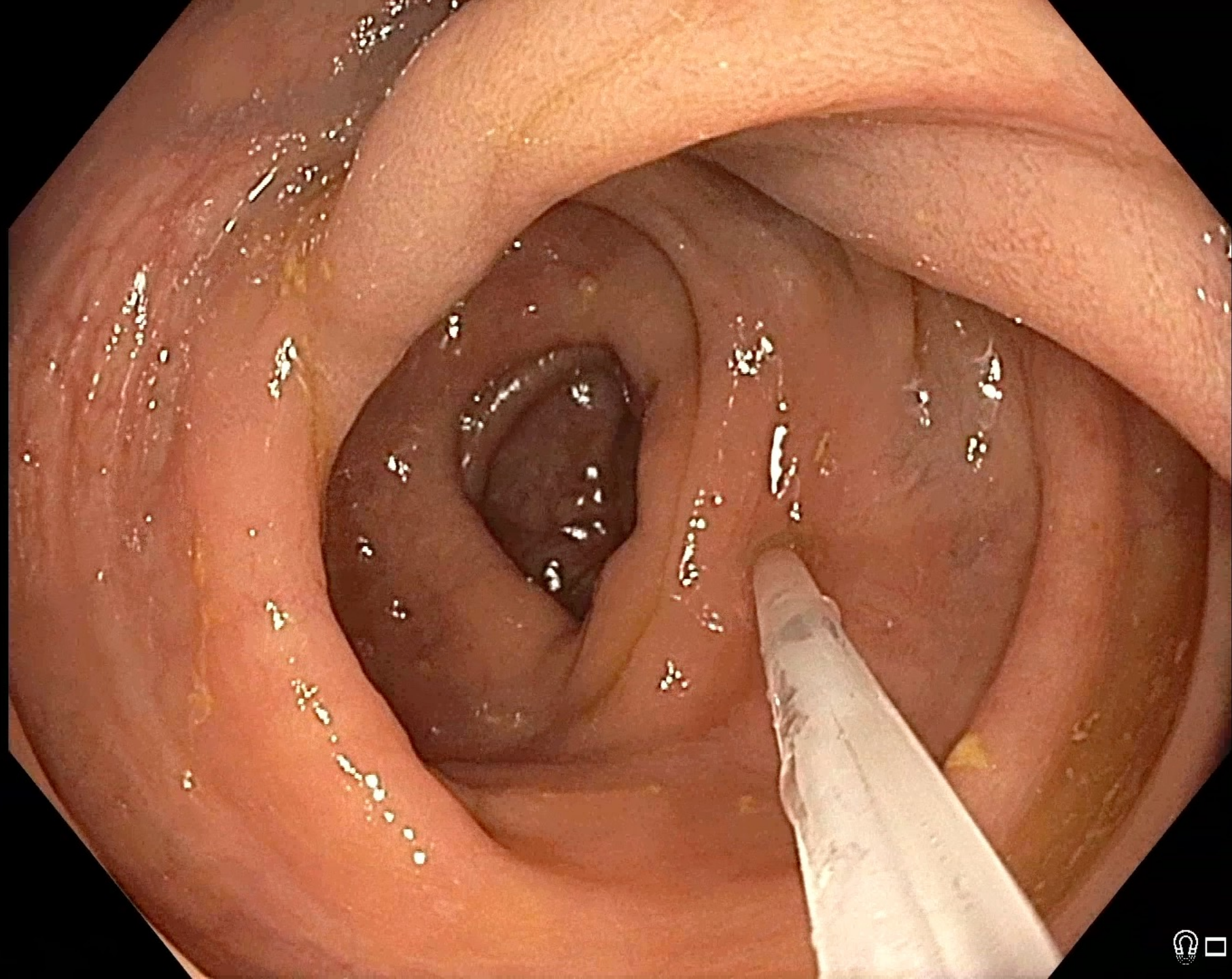
## Risk for bleeding

- ▶ **Stalk diameter > 5mm**
- ▶ **Polyp head > 20mm**
- ▶ Difficult positioning
- ▶ Patient factors for increased bleeding – ASA, NSAIDs, renal disease, etc

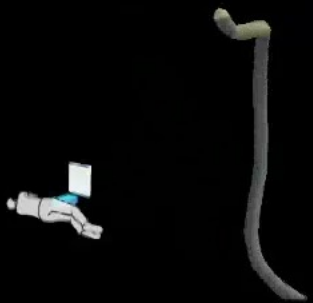


# Pretreatment

- ▶ Goal is to reduce (eliminate) immediate bleeding and prevent delayed bleeding
  - ▶ Pharmaceutical
    - ▶ Epinephrine for vasoconstriction
  - ▶ Mechanical
    - ▶ Clips
    - ▶ Ligature/loops
  - ▶ Electrocautery



45 cm



# Prophylactic clip closure to reduce bleeding after resection of LSLs

- ▶ Bishay *et al.* meta-analysis of effect of clipping to prevent DPPB
  - ▶ 11 RCTs, 9 observational studies
  - ▶ No benefit to prophylactic clipping of polyps <20mm
  - ▶ Prophylactic clipping reduces DPPB in polyps >20 mm, especially for lesions in the proximal colon

# Endoscopic treatment of Intraprocedural or Delayed Bleeding

- ▶ Epi
- ▶ Snare tip soft coag
- ▶ Clips (prudent use if further polyp to resect, finish resection first)
- ▶ BiCap/thermal probes (caution in cecum)
- ▶ Coag graspers
- ▶ Hemospray



Perforation

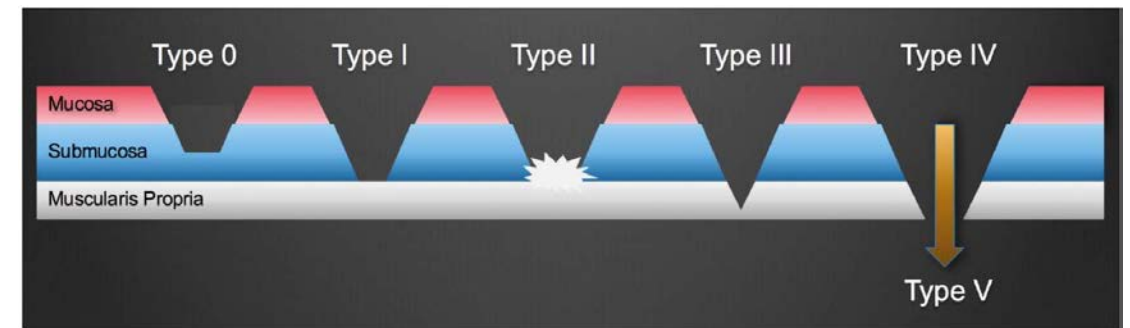
# How to Avoid Perforation

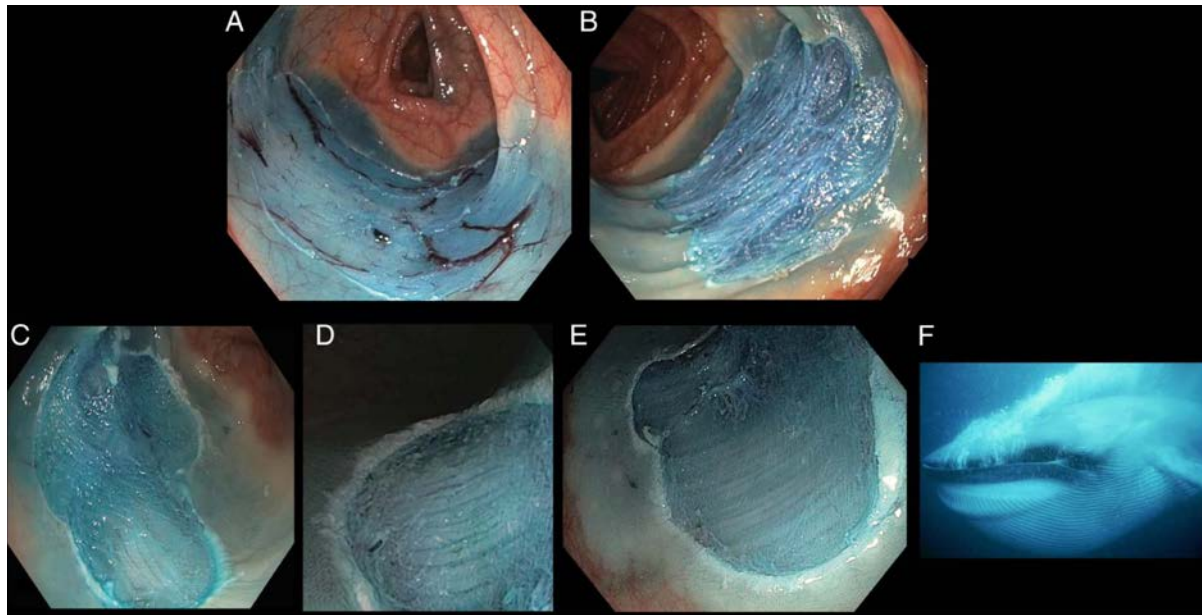
- ▶ **Cold snare all polyps <1 cm**
- ▶ Adequate submucosal injection incorporating a contrast dye for larger polyps
- ▶ Mixed current electrocautery settings (Pure cutting or coagulation current should be avoided → increased risk of bleeding and delayed perforation respectively)
- ▶ Safe tissue capture
  - ▶ Free mobility of ensnared tissue relative to colonic wall (if not → grabbing MP)
  - ▶ Able to close the snare fully with <1 cm between thumb and fingers
  - ▶ Fast transection speed (between 1-3 pulses)
  - ▶ Prevent iatrogenic submucosal fibrosis by avoiding extensive pre-EMR biopsies → common cause of Sydney Type 2 deep mural injury

# Deep Mural Injury/Perforation

## Sydney Classification of Deep Mural Injury (DMI) following EMR

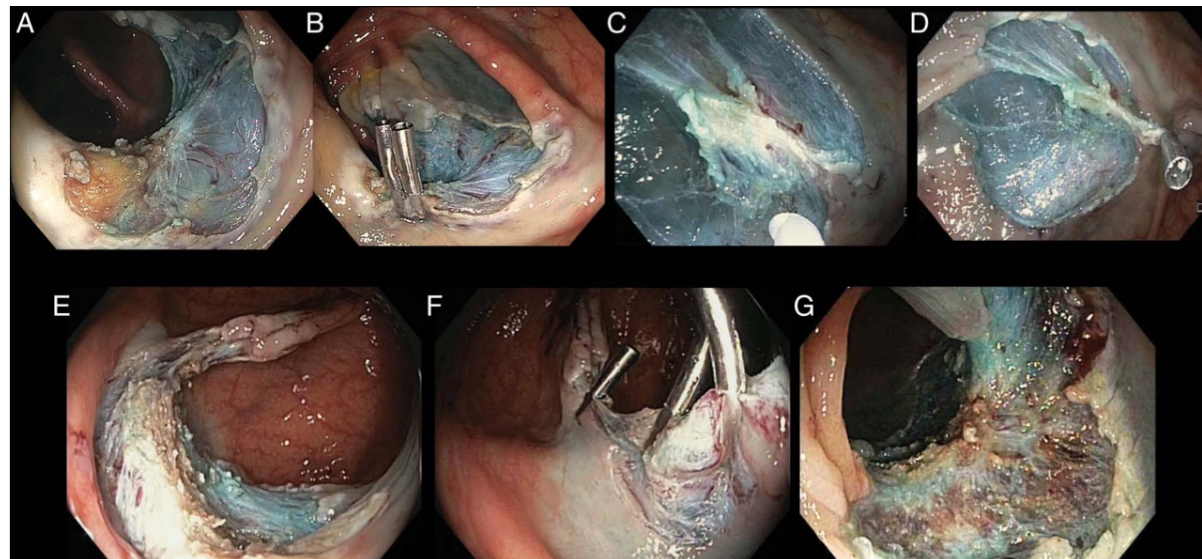
- Type 0** Normal defect. Blue mat appearance of obliquely oriented intersecting submucosal connective tissue fibres.
- Type I** MP visible, but no mechanical injury.
- Type II** Focal loss of the submucosal plane raising concern for MP injury or rendering the MP defect uninterpretable.
- Type III** MP injured, specimen target or defect target identified
- Type IV** Actual hole within a white cautery ring, no observed contamination
- Type V** Actual hole within a white cautery ring, observed contamination





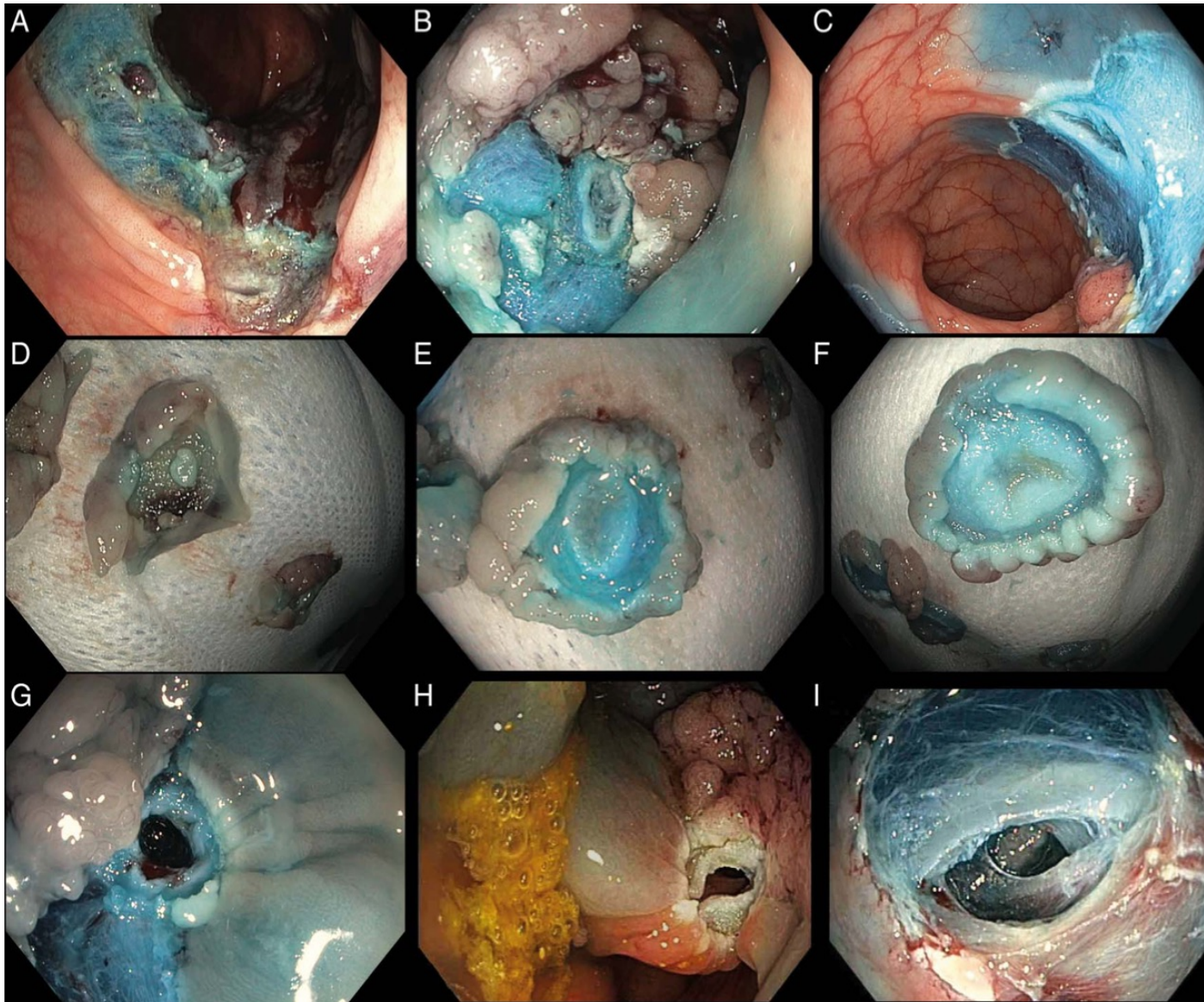
Type 0 defect (normal)

Type I defect (blue whale sign)  
 → Prophylactic closure  
 generally not needed



Type II defect (Focal loss of loss of submucosal plane- unclear due to fibrosis)  
 → clip (**risk of delayed perforation**)

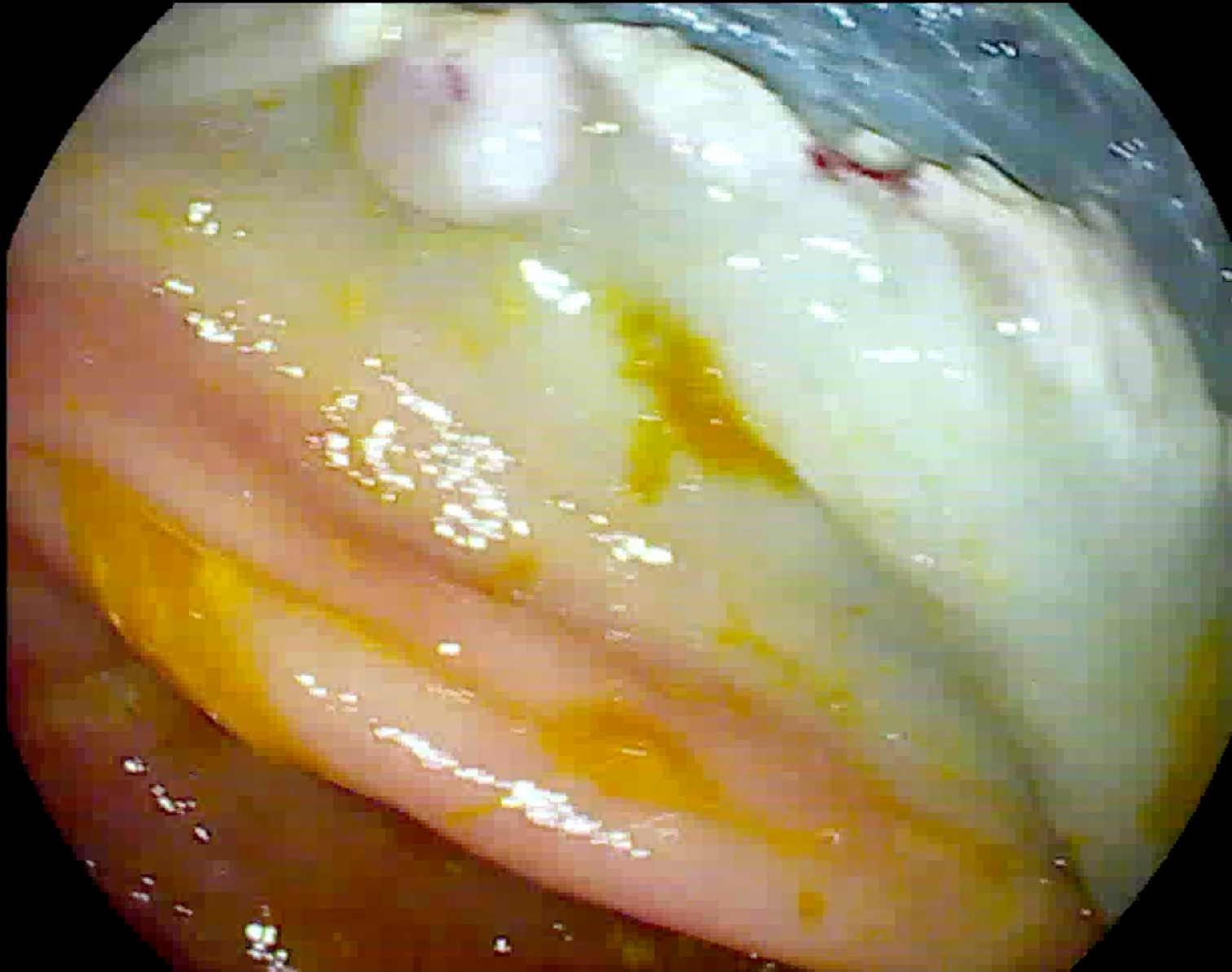




Type III defect (partial resection of MP, defect target sign, specimen target sign)  
 → clip (**risk of delayed perforation**)

Type IV defect (full thickness defect)  
 → Clip immediately

Type V defect (full thickness defect with fecal effluent contamination)  
 → Clip Immediately, consult surgery



i-scan1

Expert closure by Rachid Mohamed

# Closure Devices



OTSC Clips



TTSC Closure Devices



Endoscopic Suture



Thank you! Questions?

# References

- ▶ Ma MX, Bourke MJ. Complications of endoscopic polypectomy, endoscopic mucosal resection and endoscopic submucosal dissection in the colon. *Best Pract Res Clin Gastroenterol*. 2016 Oct;30(5):749-767. doi: 10.1016/j.bpg.2016.09.009. Epub 2016 Sep 14. PMID: 27931634.
- ▶ Klein A, Bourke MJ. Advanced polypectomy and resection techniques. *Gastrointest Endosc Clin N Am*. 2015 Apr;25(2):303-33. doi: 10.1016/j.giec.2014.11.005. Epub 2015 Feb 17. PMID: 25839688.
- ▶ Kaltenbach T, Anderson JC, Burke CA, Dominitz JA, Gupta S, Lieberman D, Robertson DJ, Shaukat A, Syngal S, Rex DK. Endoscopic Removal of Colorectal Lesions: Recommendations by the US Multi-Society Task Force on Colorectal Cancer. *Am J Gastroenterol*. 2020 Mar;115(3):435-464. doi: 10.14309/ajg.0000000000000555. PMID: 32058340.