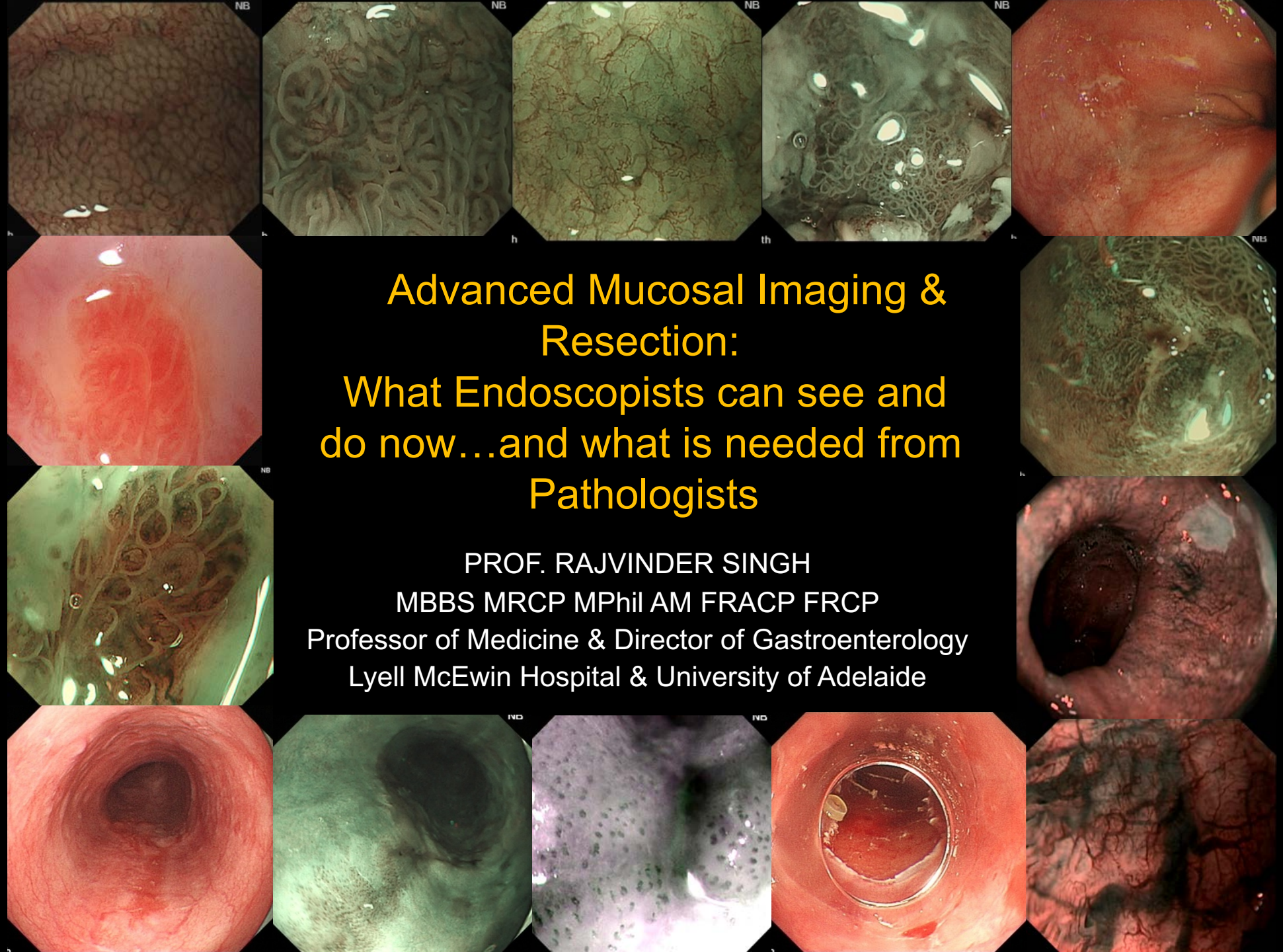

# Advanced Mucosal Imaging & Resection: What Endoscopists can see and do now…and what is needed from Pathologists

PROF. RAJVINDER SINGH
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Professor of Medicine & Director of Gastroenterology
Lyell McEwin Hospital & University of Adelaide

# Background

- Advanced Endoscopic Mucosal Imaging and resection techniques which are not commonly used in general practice but is rapidly evolving and increasingly being adopted

- Type of specimens Pathologists can come to expect - mucosal, submucosal, full thickness

# Overview

- Oesophagus
- Stomach
- Colon

# Overview

- Oesophagus
- Stomach
- Colon

# Oesophagus

- SCC

- Where we are at
- Pushing the boundaries

- BE

- Where we are at
- Pushing the boundaries

# Oesophagus

- SCC
  - Where we are at
  - Pushing the boundaries

- BE
  - Where we are at
  - Pushing the boundaries

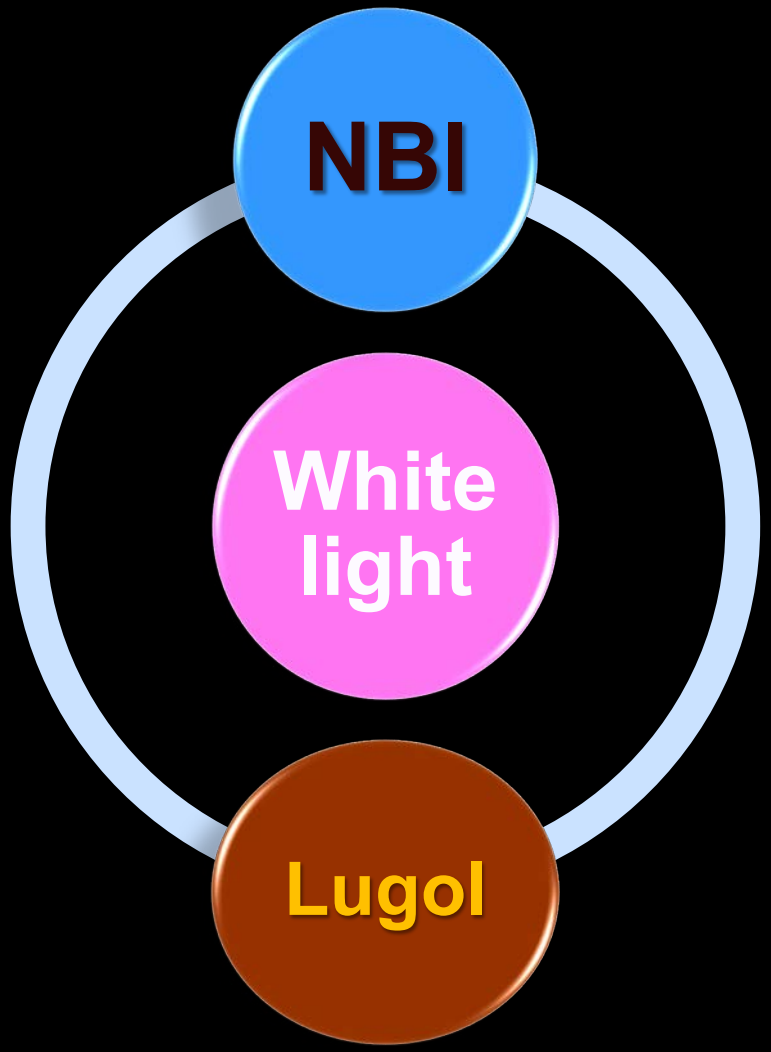
# SCC

- Detection
- Characterization
- Rx

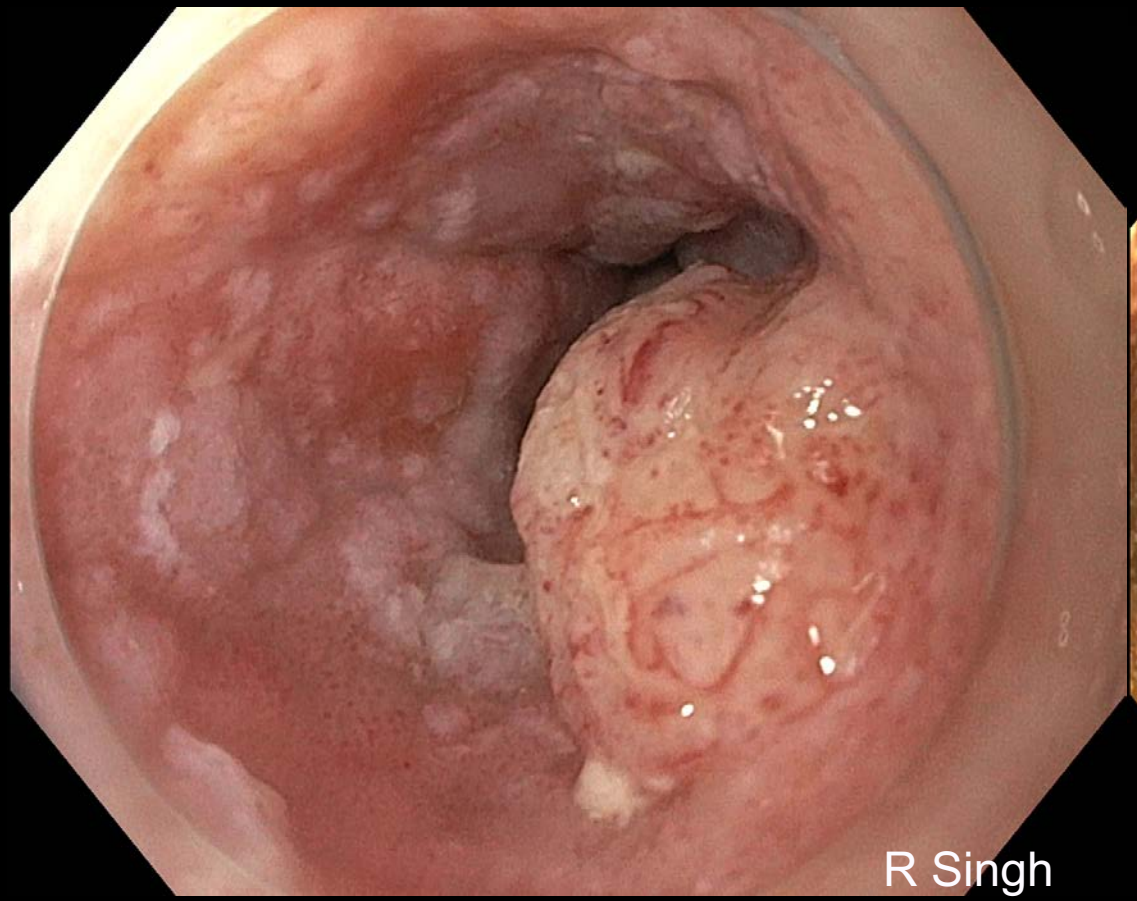
# SCC

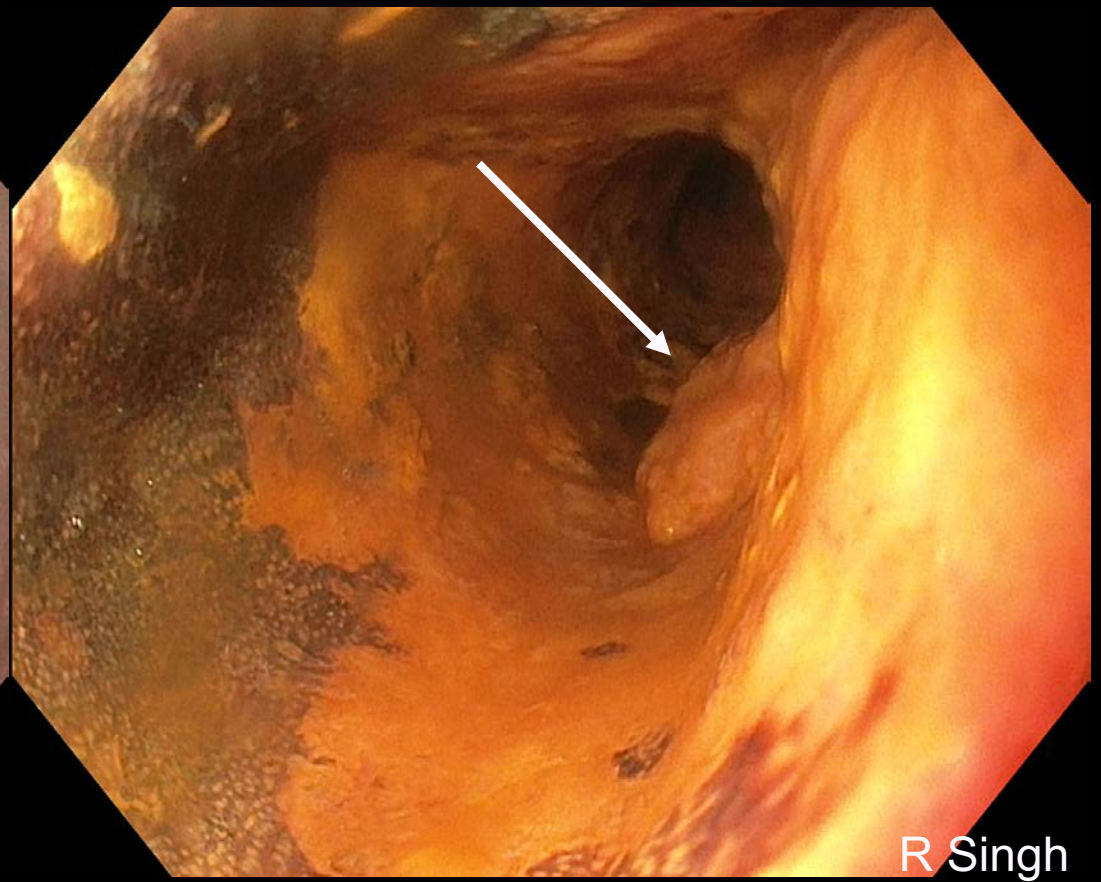
- Detection
- Characterization
- Rx

# SCC: Detection

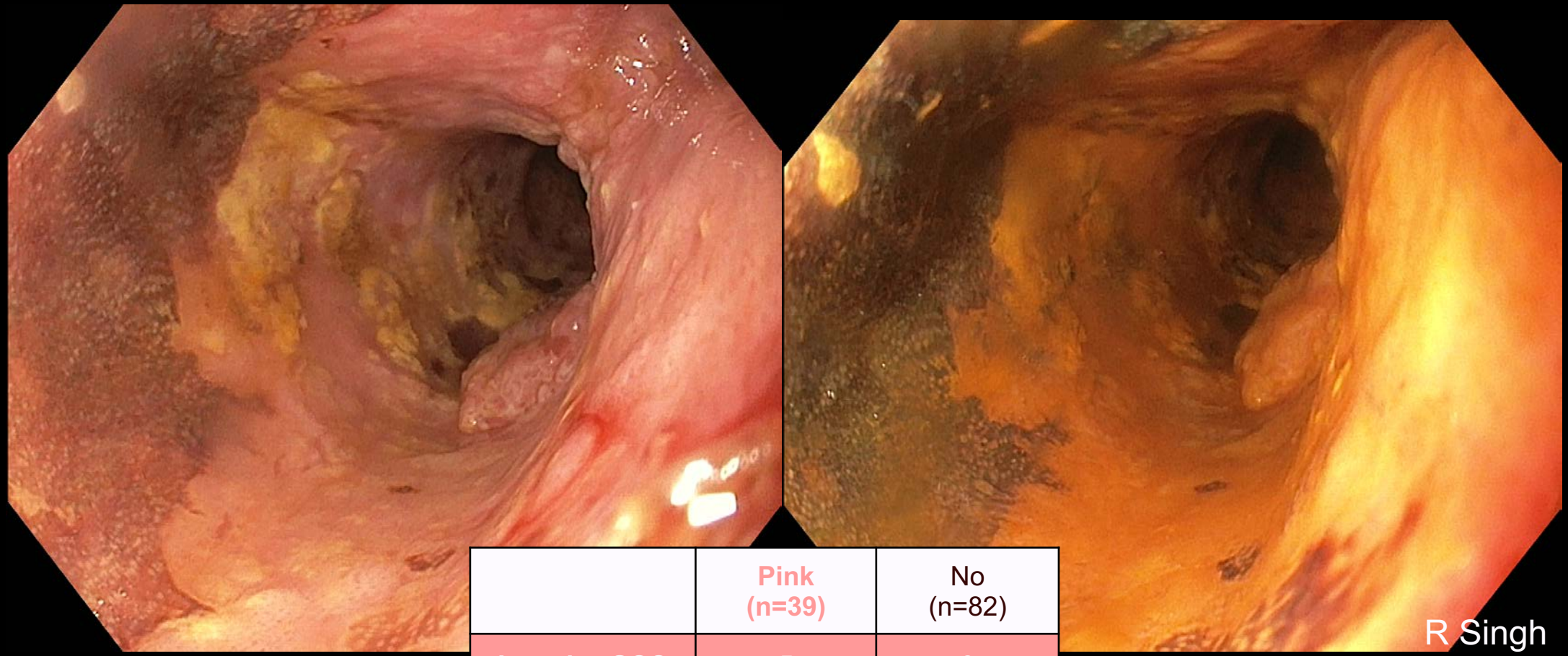


# Lugol chromoendoscopy



# ‘Pink colour’ sign



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| | Pink (n=39) | No (n=82) |
|---|---|---|
| Invasive SCC | 5 | 0 |
| HGIN | 29 | 3 |
| LGD | 1 | 57 |
| Inflammation | 4 | 22 |



Shimizu Y et al. JGH 2008

# SCC

- Detection
- Characterization (Depth)
- Rx

# Magnifying Endoscopy Classification for SCC

| Type | Magnified endoscopic findings of microvessels | | | Invasion depth |
|---|---|---|---|---|
| A | ***Without*** **severe** irregularity | | **Normal *IPCL*** or with **mild** irregularity | Normal or LGIN |
| B | ***With*** **severe** irregularity **(i.e. Abnormal vessels)** | **1** | ***With*** a **loop-like** formation | **EP / LPM** |
| | | **2** | ***Without*** a **loop-like** formation | **MM / SM1** |
| | | **3** | **Highly dilated abnormal vessels** | **>SM2** |

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Japanese Esophageal Society. Esophagus 2011

# Japanese Esophageal Society Classification

| Type | A1 | A2 | B1 | B2 | B3 |
|---|---|---|---|---|---|
| Vascular finding |  |  | Loop vessel  | Non-loop vessel  | Thick green vessel  |
| Epithelial finding | | | AVA-small (<0.5 mm)  | AVA-medium (0.5-3mm)  | AVA-large (>3mm)  |
| Most likely pathology | Non-neoplasm | | Neoplasm | | |
| | Normal | Inflam | m1-2 | m3-sm1 | >sm2 |
| ER | NO | | YES | +/- | NO |

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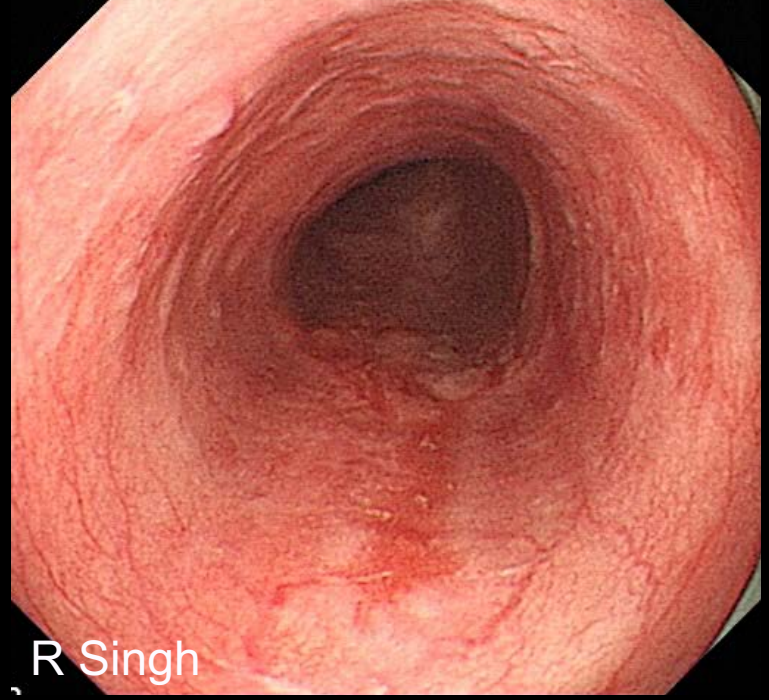
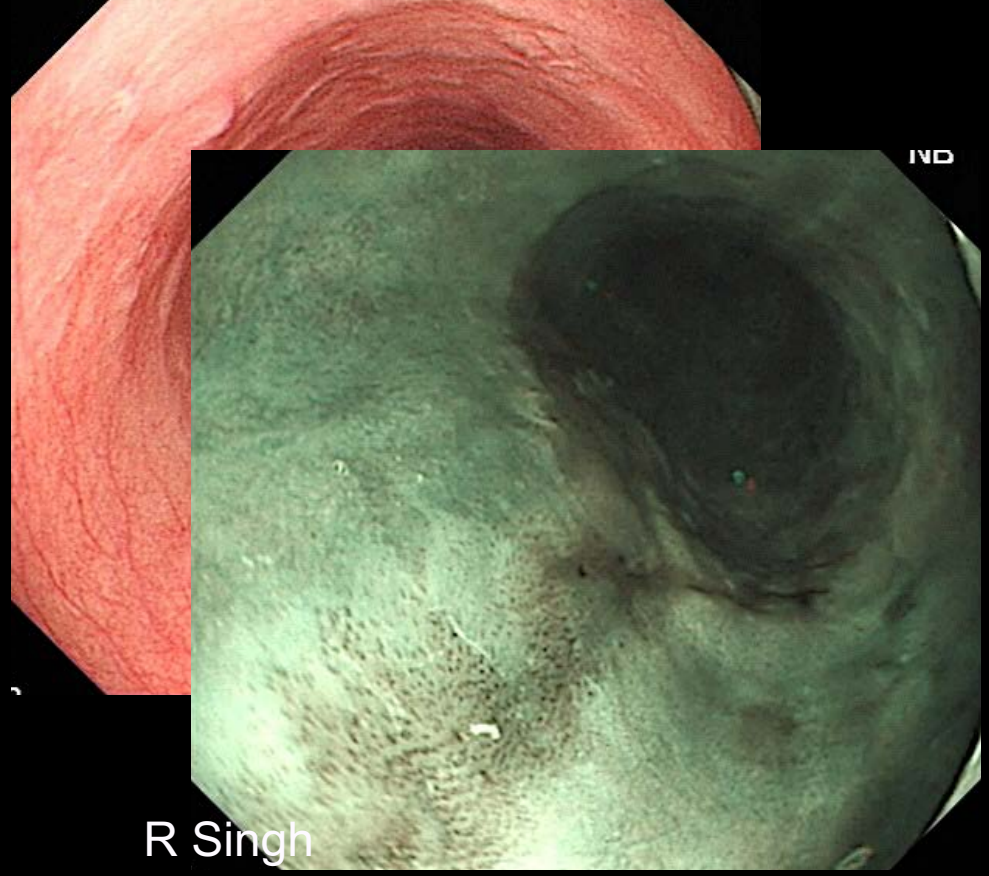
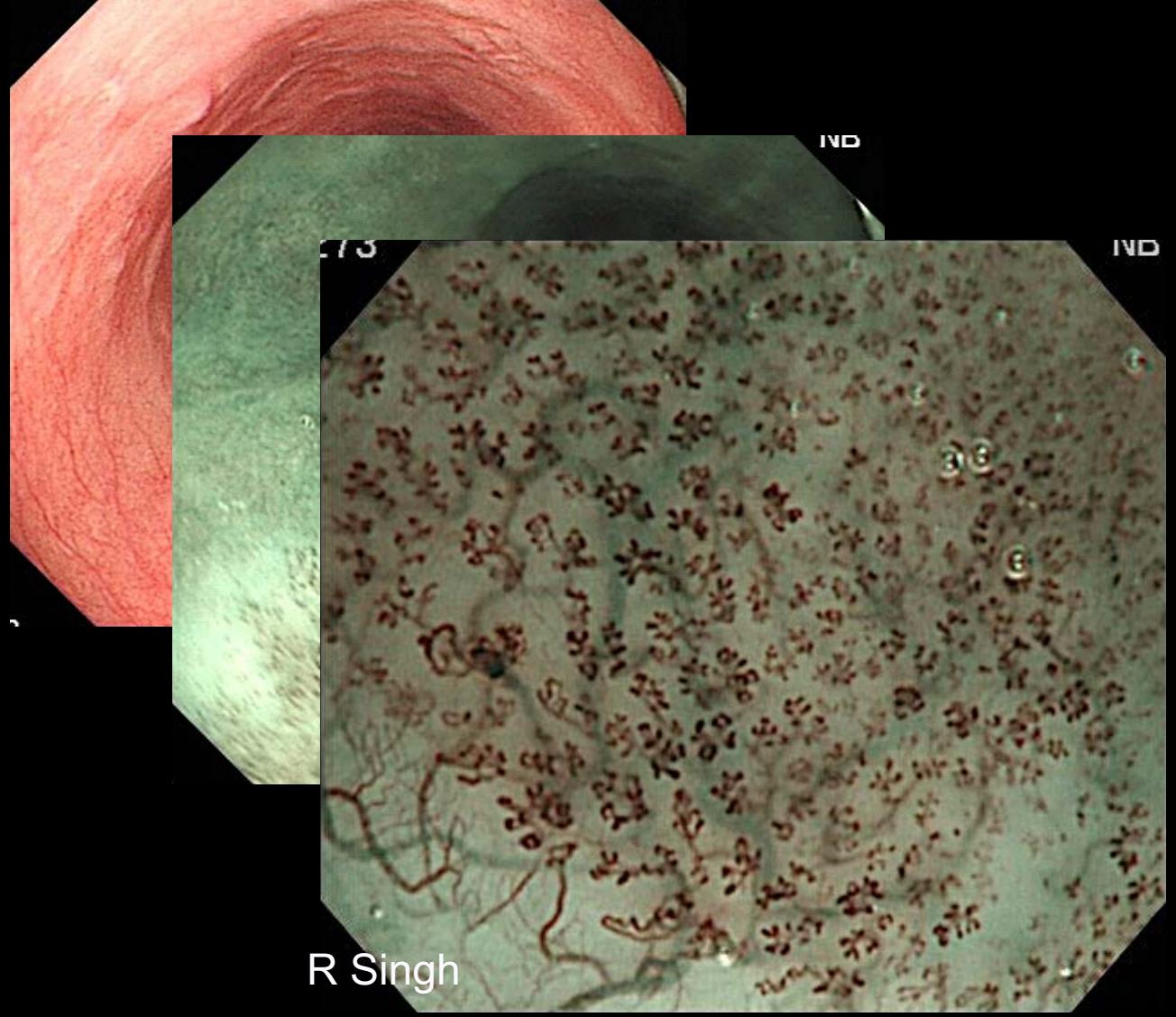



# Case

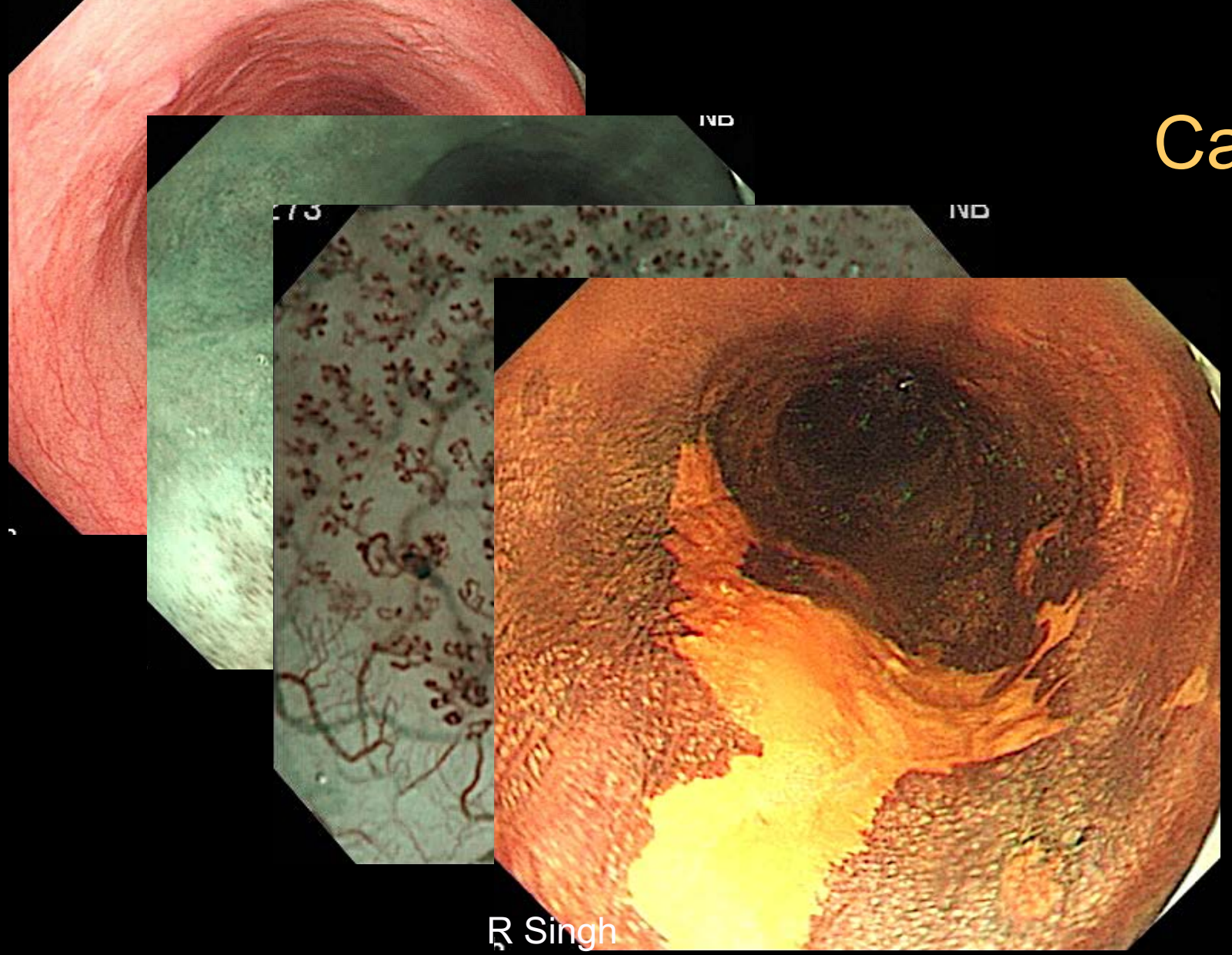



# Case

# Case



# Case

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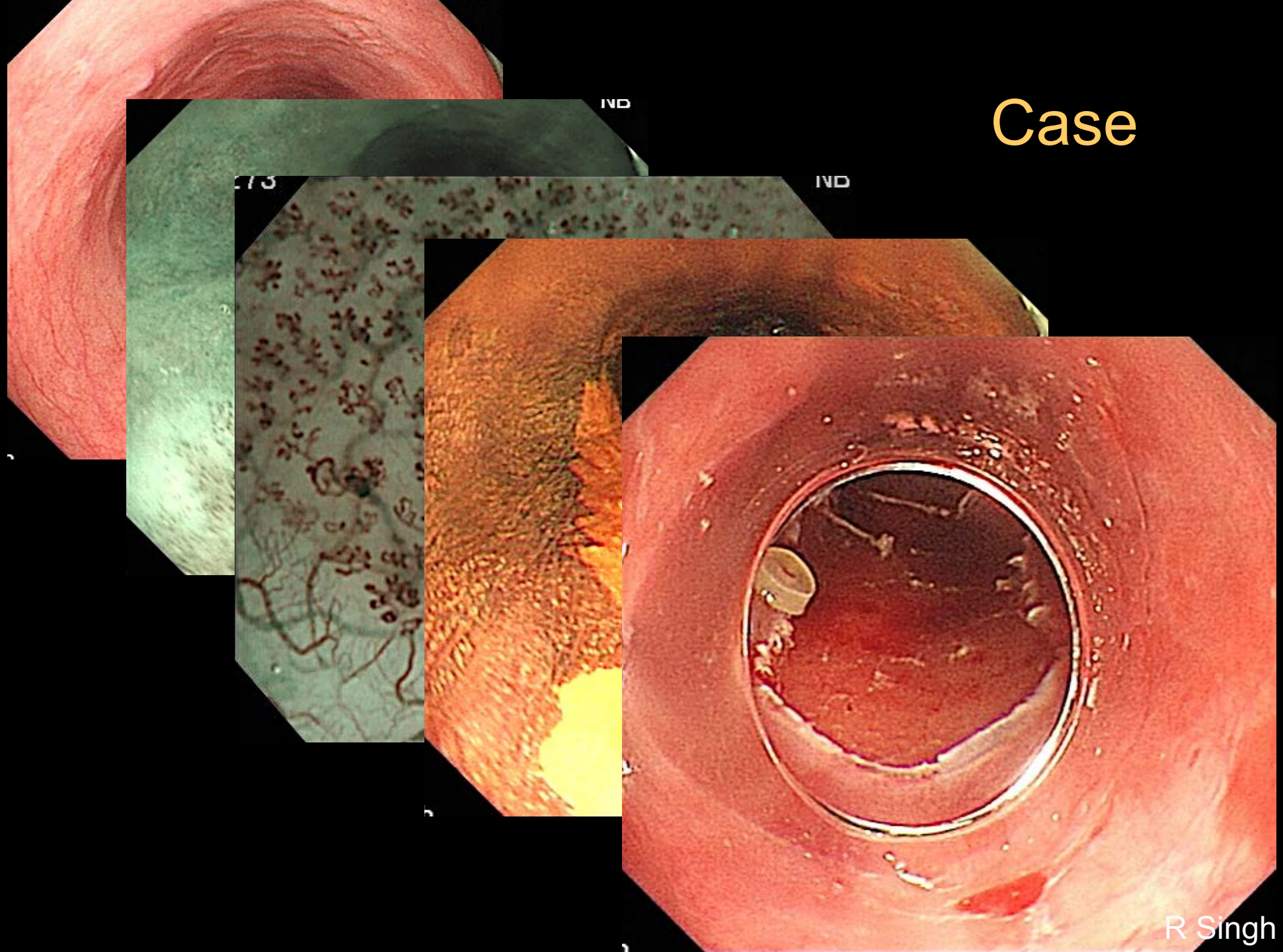
# Case



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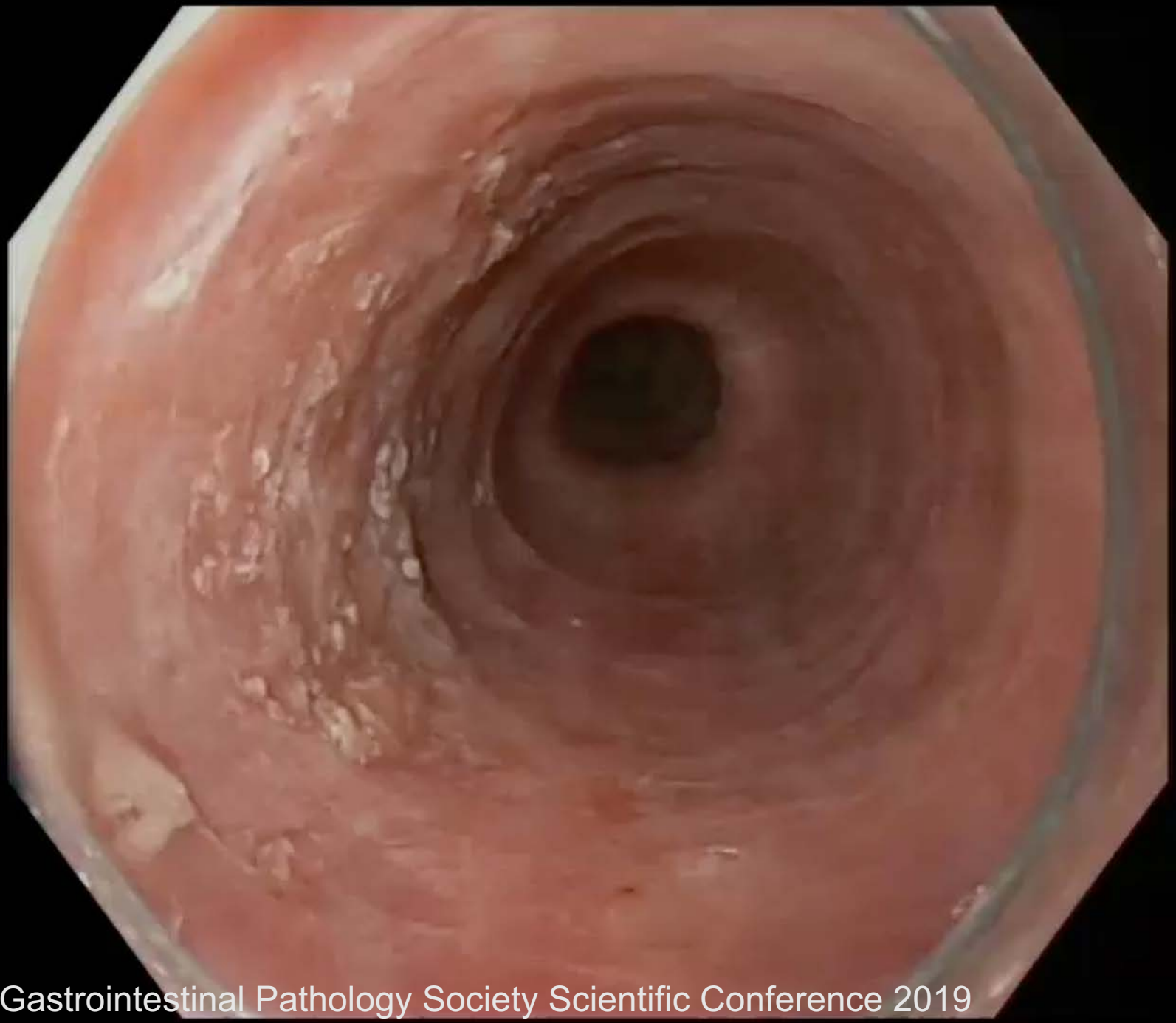
# Treatment:
# Endoscopic Submucosal Dissection

- Any lesion >1cm (most lesions)



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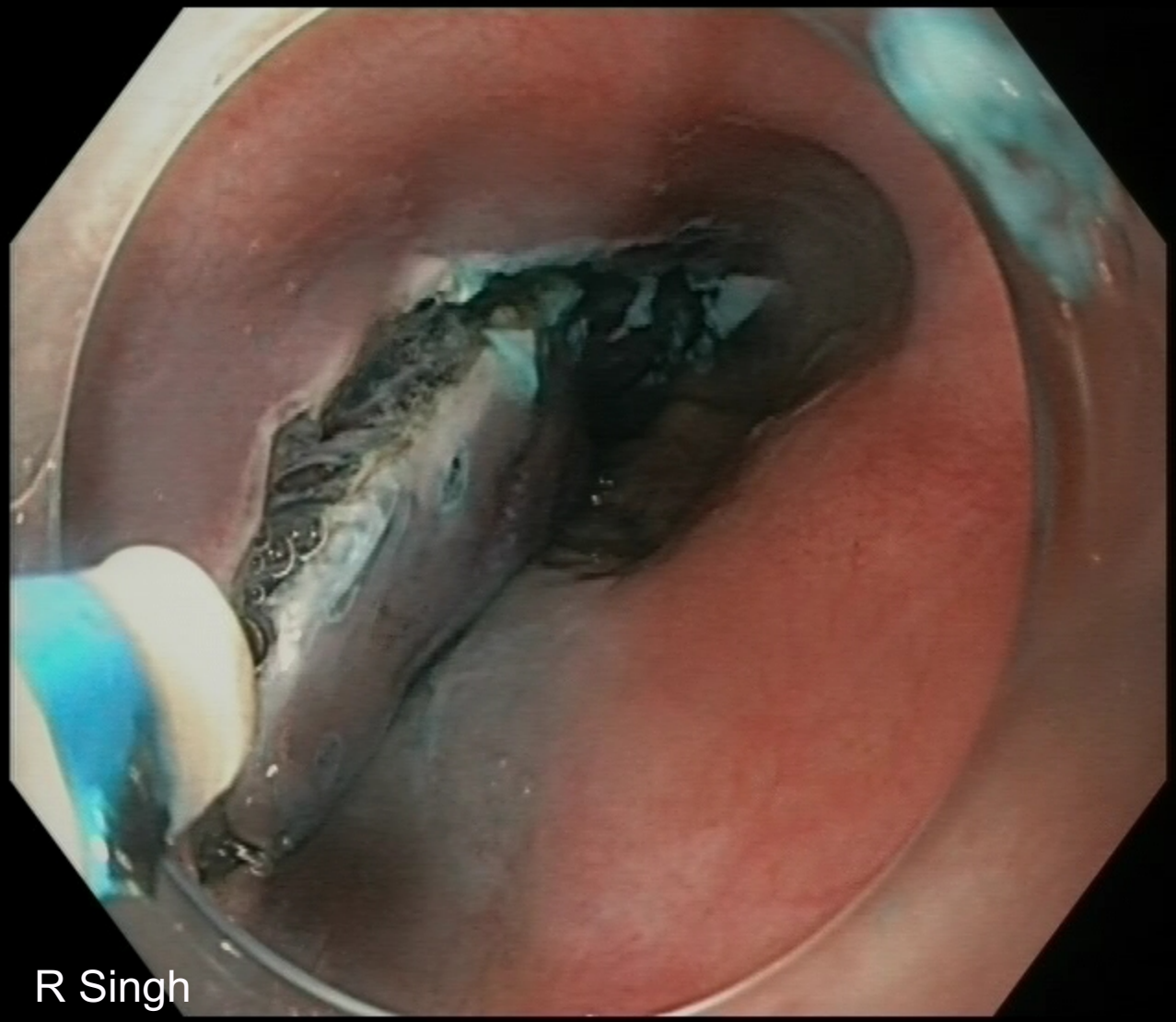

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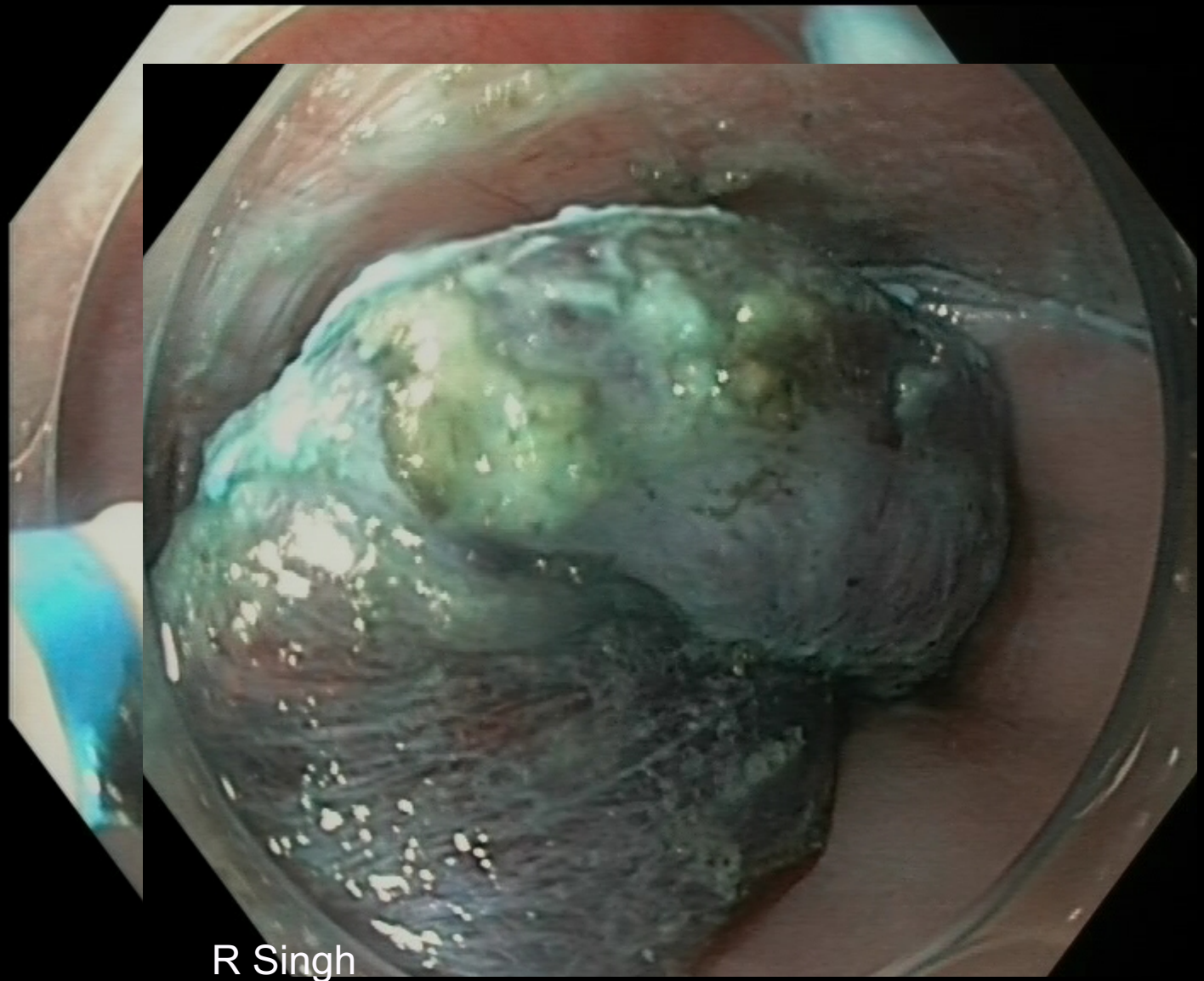
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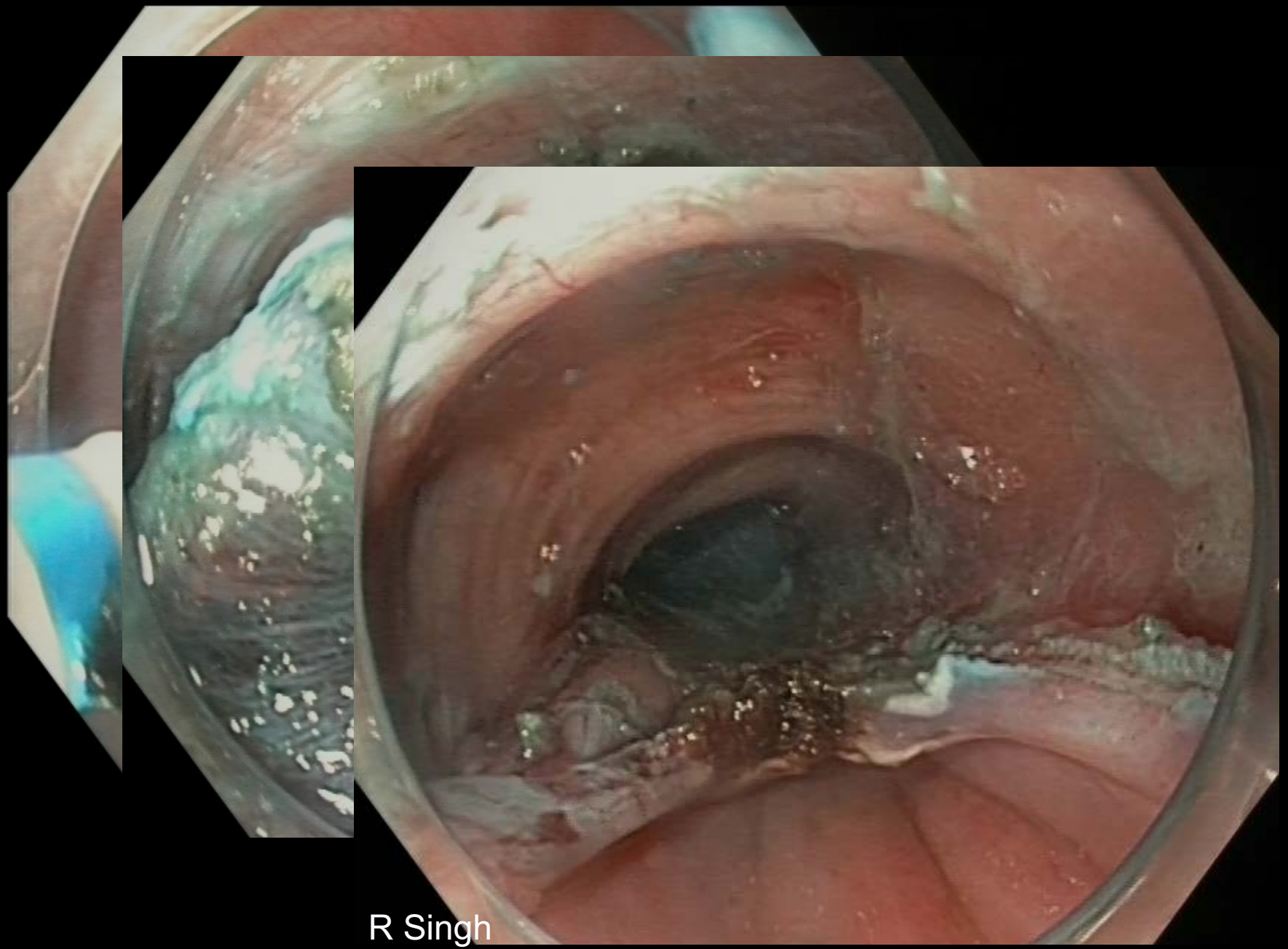
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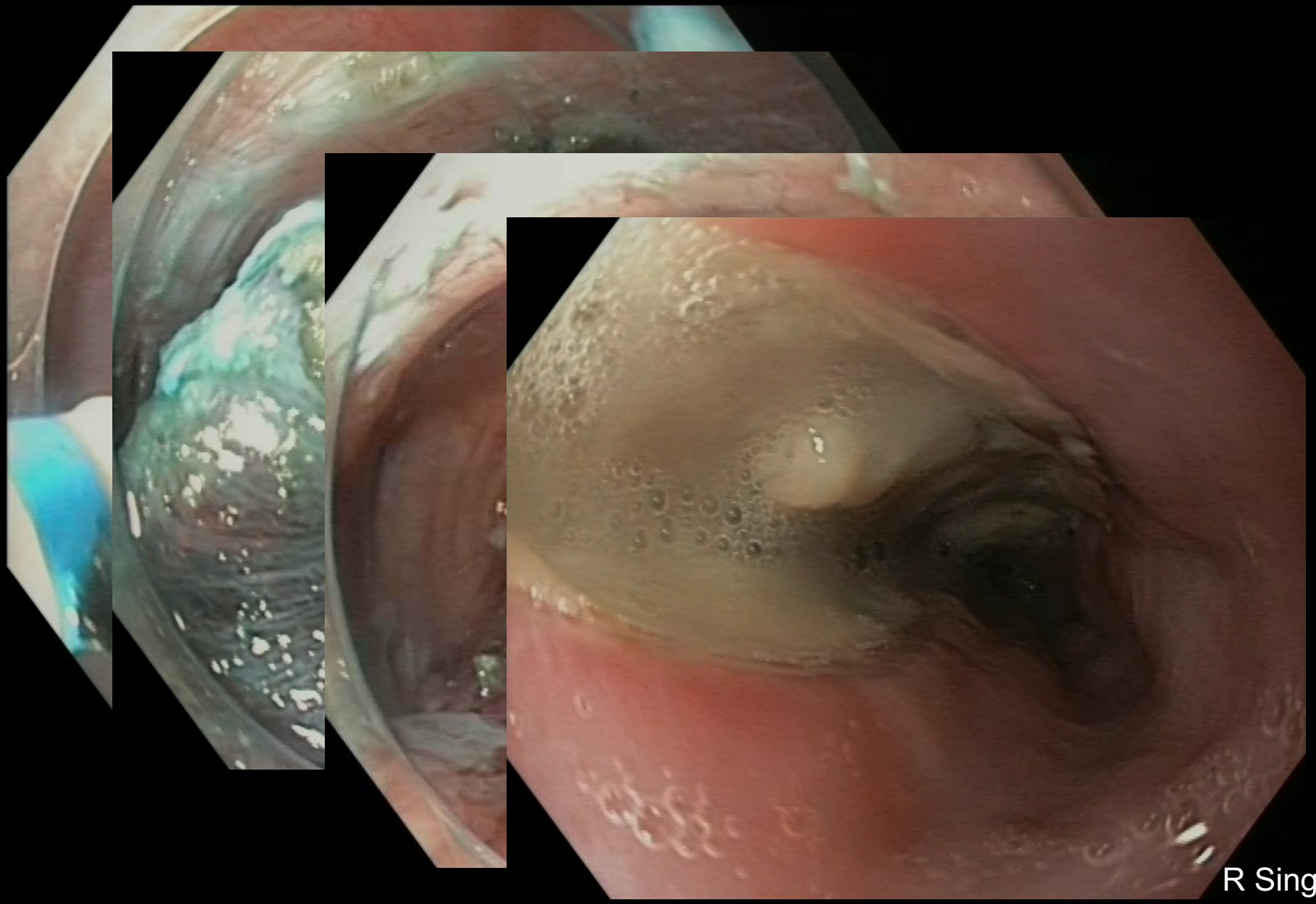
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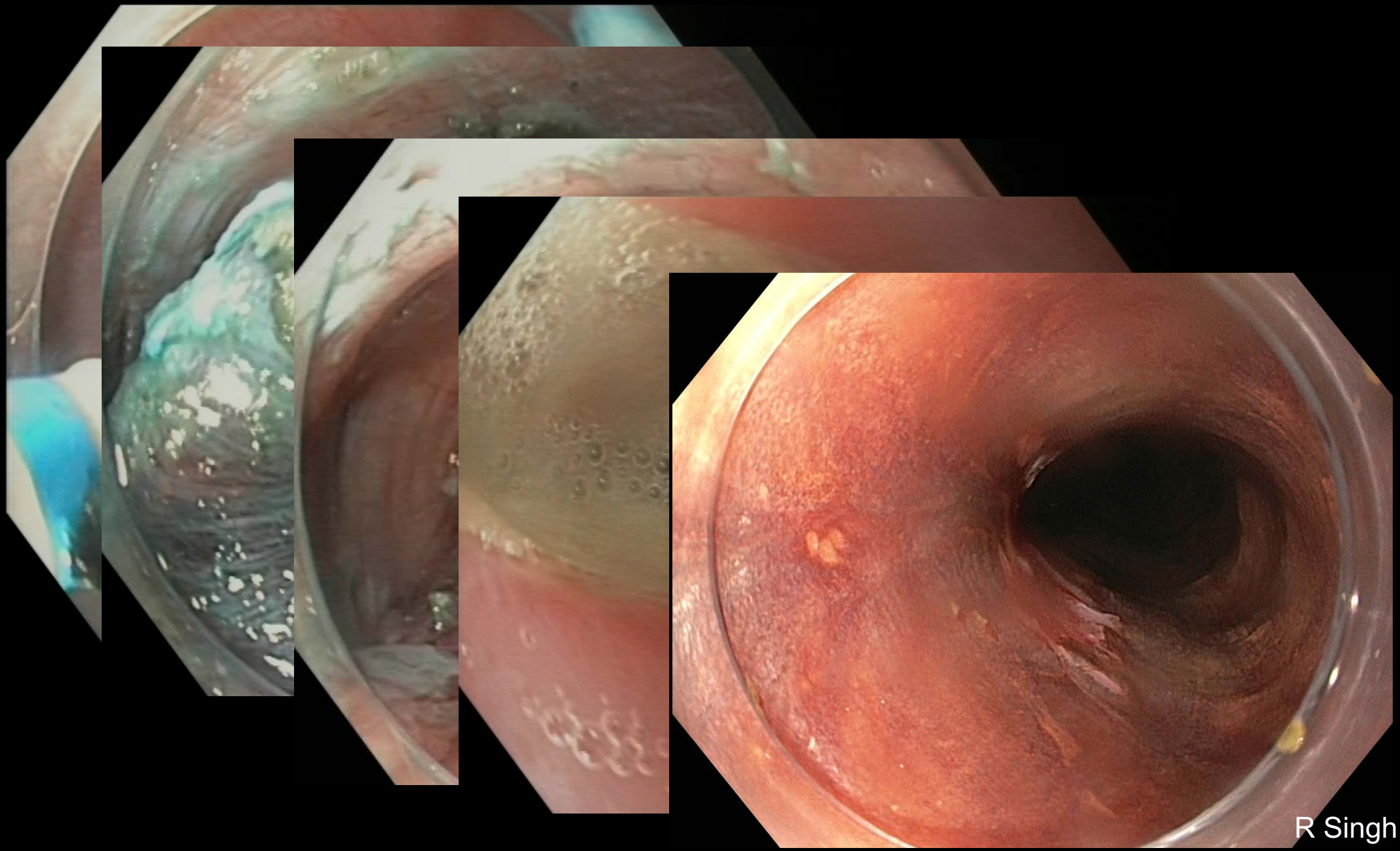
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# What Gastroenterologists need

- Differentiation between dysplasia and inflammation
- Depth of invasion into mucosa/submucosa (um) after Endoscopic Resection ..may help with treatment decisions

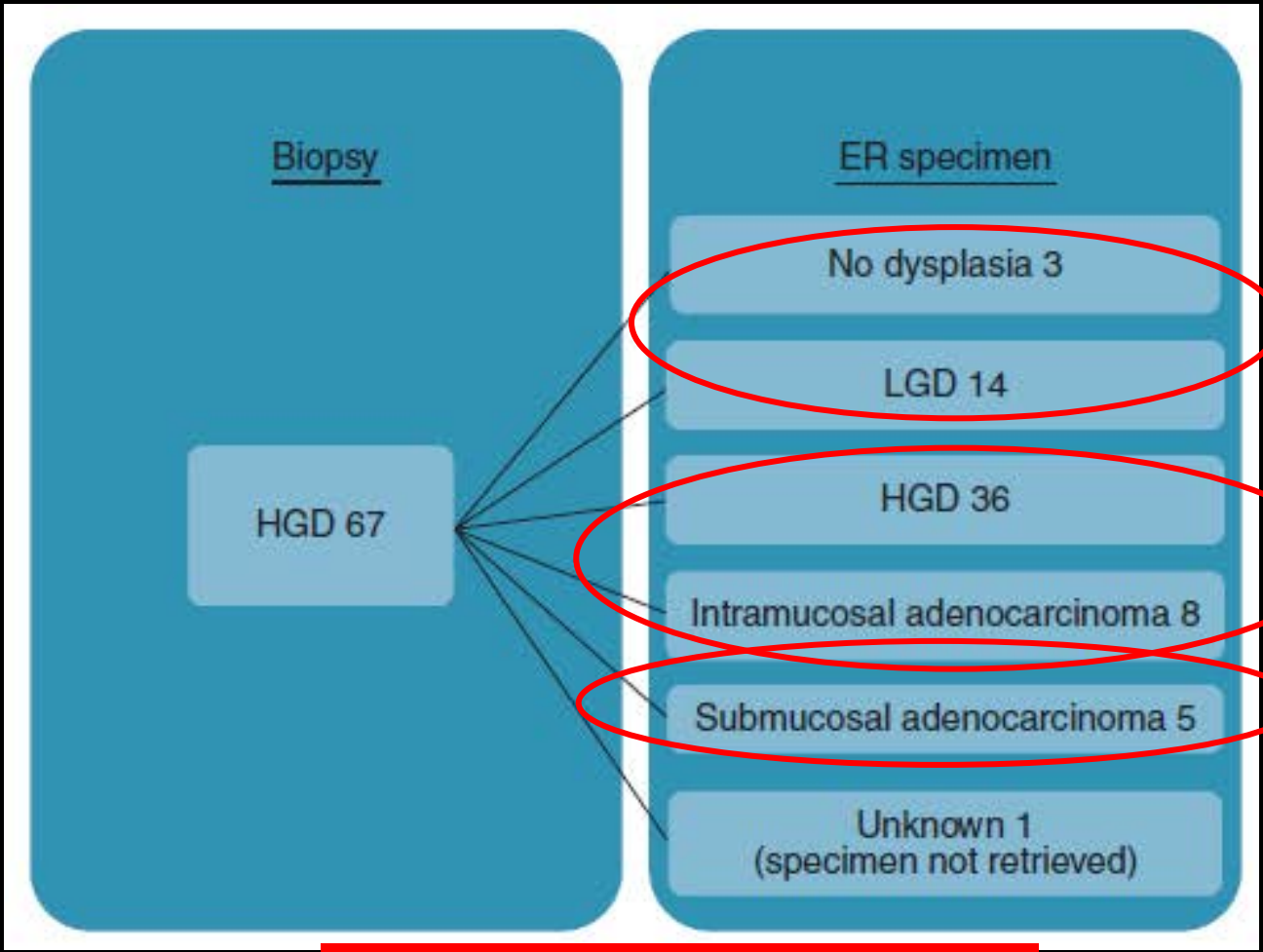
# Oesophagus

- SCC
- Where we are at
- Pushing the boundaries

- BE
- Where we are at
- Pushing the boundaries

# What we know

## 1. Endoscopic Mucosal Resection: An essential staging procedure




CHANGES DIAGNOSIS in 44%

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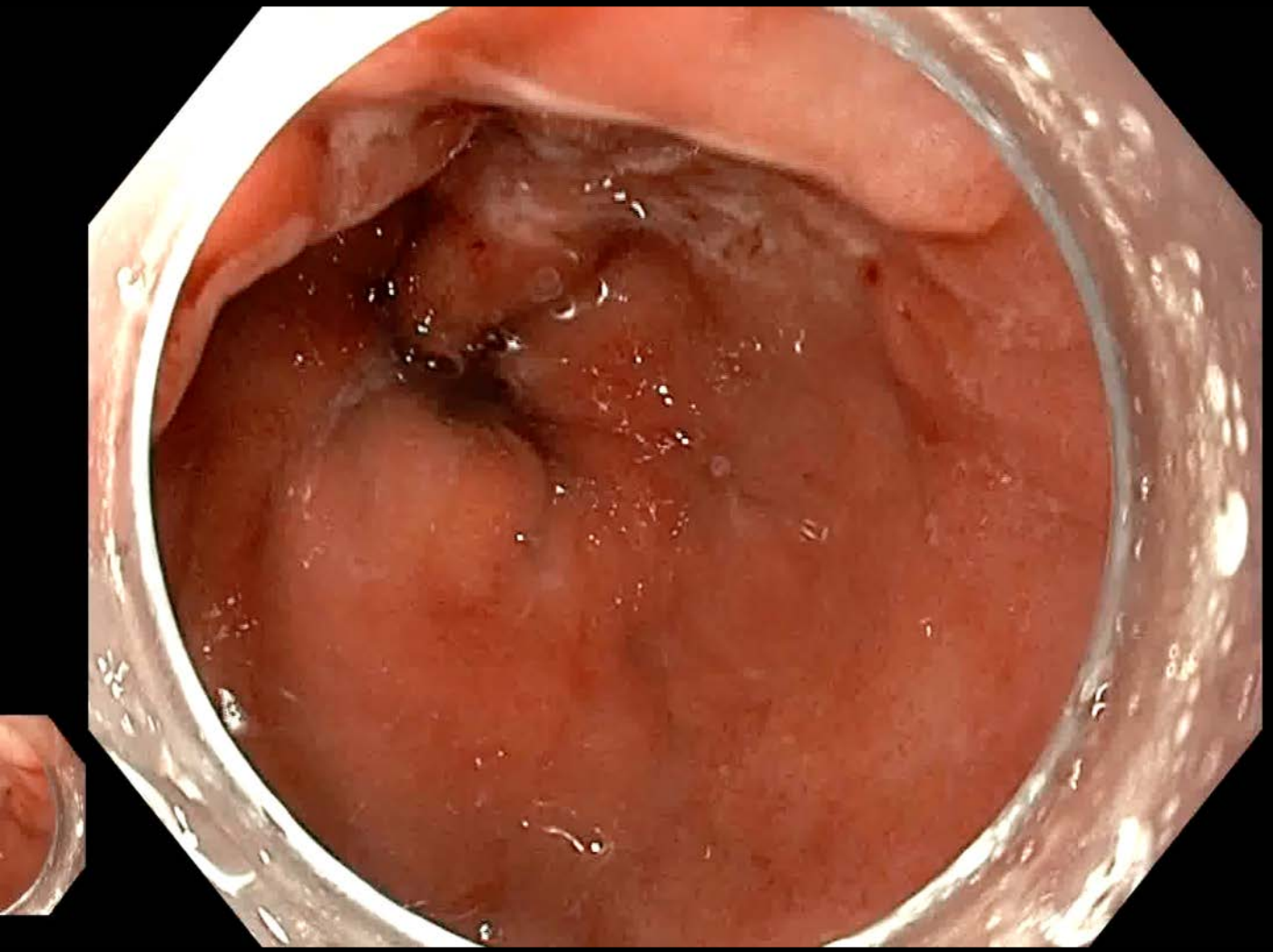
Moss et al AJG 2010

# When to perform EMR?



- Evidence of any focal abnormality
- Any lesion < 15 mm that requires an en-bloc resection
- Larger lesions, however, can be resected piecemeal

# What we know
## 2. long term follow up

## Long Term EMR F/u

Gastroenterology 2014;146:652–660

**CLINICAL—ALIMENTARY TRACT**

### Long-term Efficacy and Safety of Endoscopic Resection for Patients With Mucosal Adenocarcinoma of the Esophagus

Oliver Pech,[1] Andrea May,[2] Hendrik Manner,[2] Angelika Behrens,[2] Jürgen Pohl,[2] Maren Weferling,[2] Urs Hartmann,[2] Nicola Manner,[2] Josephus Huijsmans,[2] Liebwin Gossner,[3] Thomas Rabenstein,[4] Michael Vieth,[5] Manfred Stolte,[6] and Christian Ell[2]

*[1]Department of Gastroenterology and Interventional Endoscopy, St John of God Hospital, University of Regensburg, Regensburg; [2]Department of Internal Medicine II, HSK Wiesbaden, University of Mainz, Wiesbaden; [3]Department of Internal Medicine II, Klinikum Karlsruhe, Karlsruhe; [4]Department of Gastroenterology, Diakonissen Krankenhaus, Speyer; [5]Institute of Pathology, Bayreuth Hospital, University of Erlangen-Nuremberg, Bayreuth; [6]Department of Pathology, Klinikum Kulmbach, Kulmbach, Germany*



Pech et al, Gastroenterology, 2014

**Table 2.** Acute and Long-term Results

| | |
|---|---|
| ERs (n) | 2687 |
| ERs per patient; median (interquartile range) | 1 (1–3) |
| Major complications, n (%) | 15 (1.5%) |
| Major bleeding | 14 |
| Perforation | 1 |
| Complete local remission, n (%) | 963/1000 (96.3) |
| Time until complete local remission (*mo*), median (interquartile range) | 1 (1–3) |
| Follow-up (*mo*), mean ± SD | 56.6 ± 33.4 |
| Metachronous lesions, n (%) | 140/963 (14.5) |
| Long-term complete local remission after repeat ER, n (%) | 938/1000 (93.8) |



Repici et al. Gastroenterology 2014

# What we know

## 3. Factors associated with recurrence

| Variable | Relative risk (95% CI) |
|---|---|
| Long-segment Barrett's oesophagus | 1.9 (1.06 to 3.3) |
| Time until CLR achieved >10 months | 0.3 (0.12 to 0.75) |
| Piecemeal resection | 2.44 (1.13 to 4.89) |
| Multifocal neoplasia | 2.1 (1.16 to 3.99) |
| No ablative therapy of Barrett's oesophagus after CLR | 2.5 (1.52 to 3.85) |

CI, confidence interval; CLR, complete local remission.

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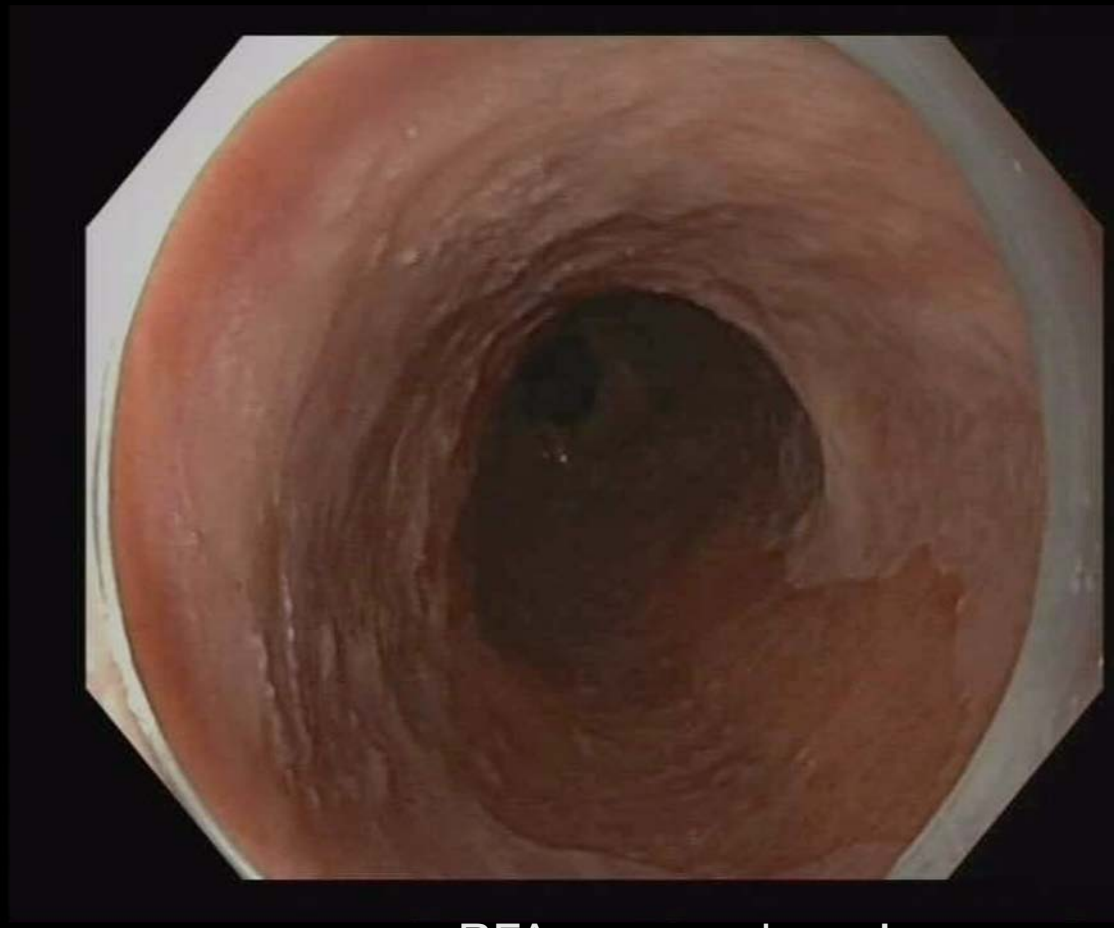
Pech & Ell Gut 2008

# RFA + ER: Systematic review

| | Focal RFA + EMR | Radical EMR |
|---|---|---|
| **Number of patients** | 774 | 751 |
| **Recurrence**<br>EAC<br>Dysplasia<br>IM | <br>1.5%<br>2.6%<br>16% | <br>0.7%<br>3.3%<br>12% |
| **Strictures** | **10%** | **33%** |

Desai M et al. GIE 2017



RFA= no specimen !

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# Before EMR

Careful mucosal imaging is essential

# Oesophagus

- SCC
- Where we are at
- Pushing the boundaries

- BE
- Where we are at
- Pushing the boundaries

# BE: Unanswered by Mucosal Imaging

- Squamous tissue overgrowth
- LGD
- HGD vs intramucosal/superficial submucosal cancer

# BE: Unanswered by Mucosal Imaging

- Squamous tissue overgrowth - margins
- LGD
- HGD vs intramucosal/superficial submucosal cancer

# BE: Unanswered by Mucosal Imaging

- Squamous tissue overgrowth
- LGD – margins?
- HGD vs intramucosal/superficial submucosal cancer


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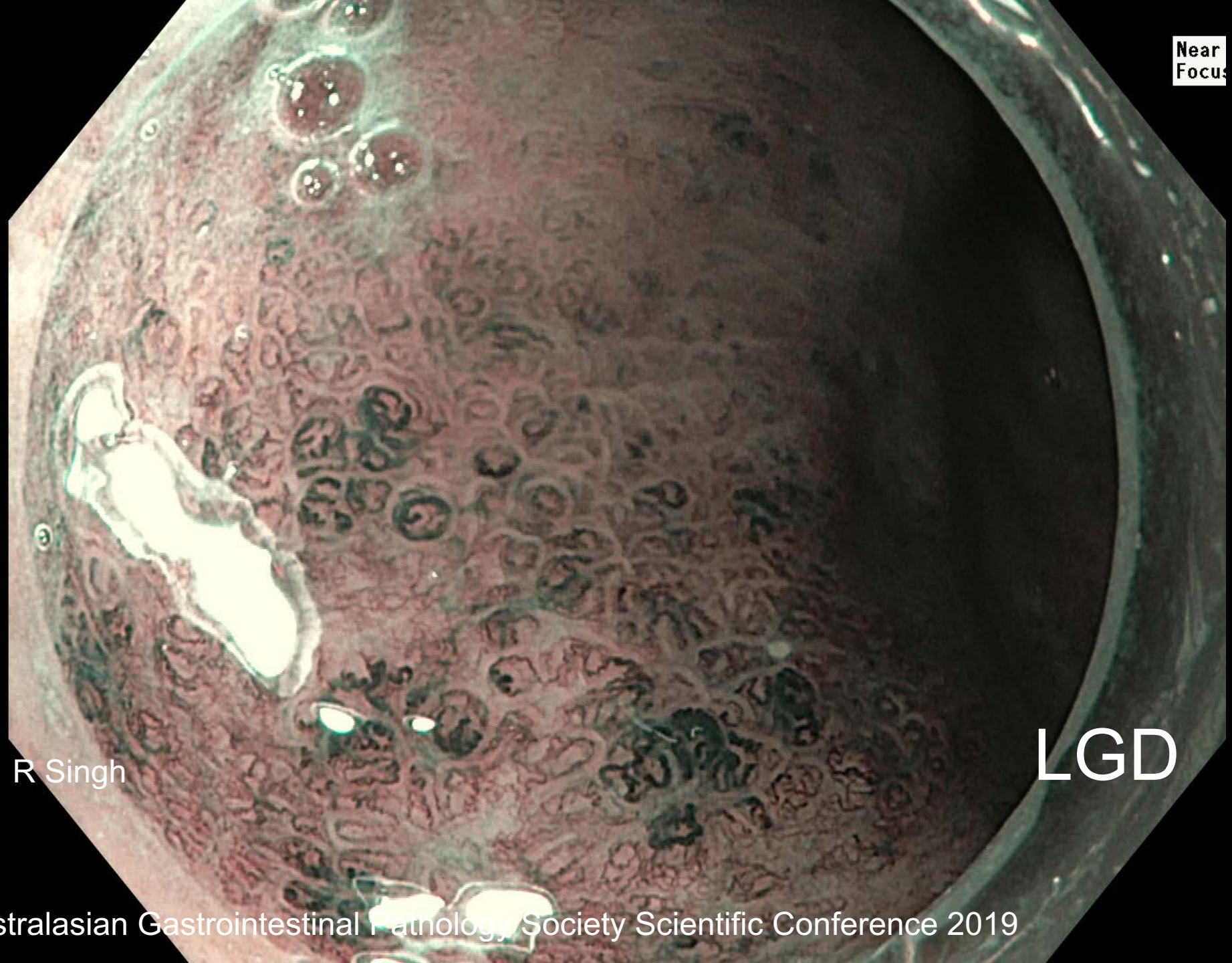
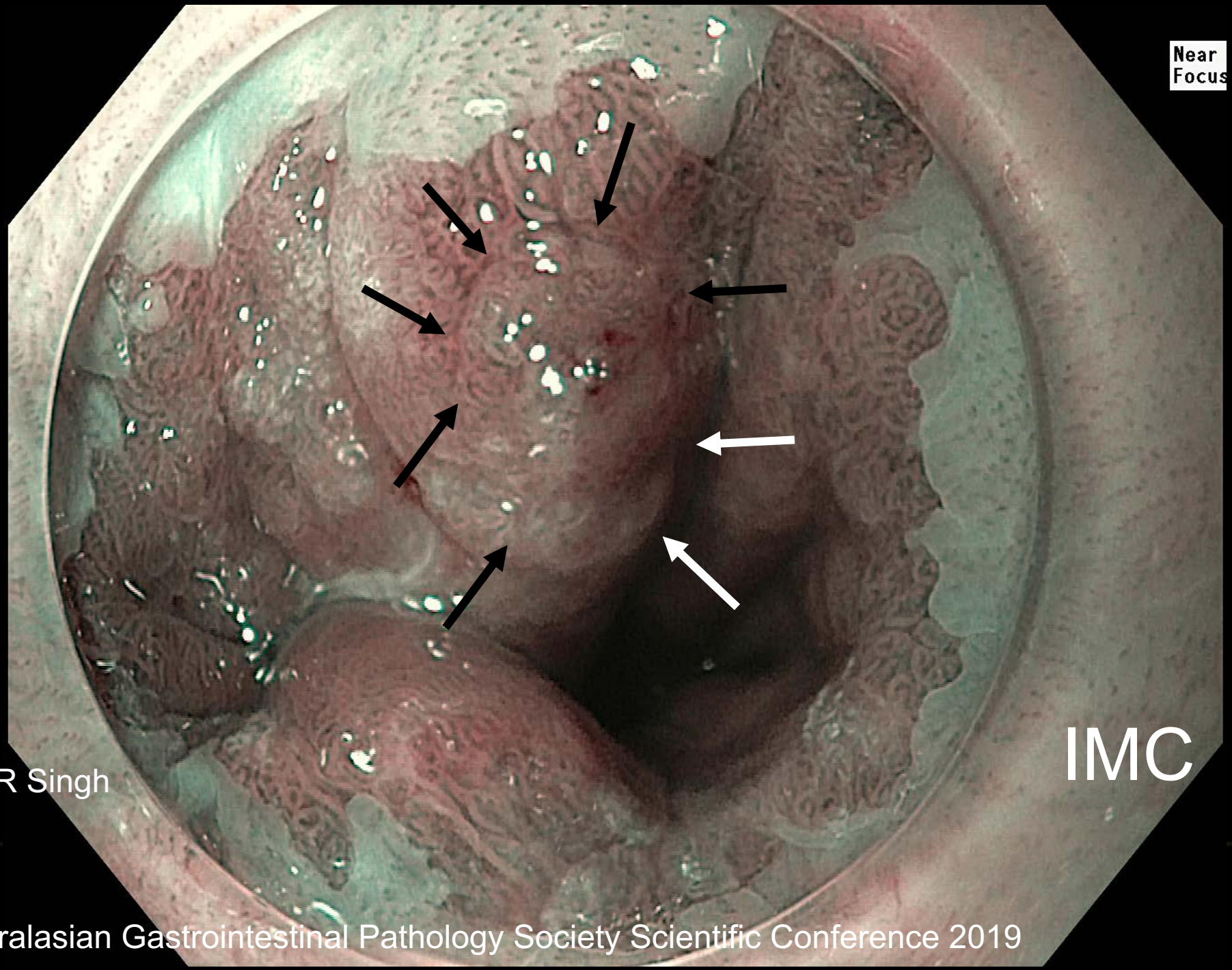
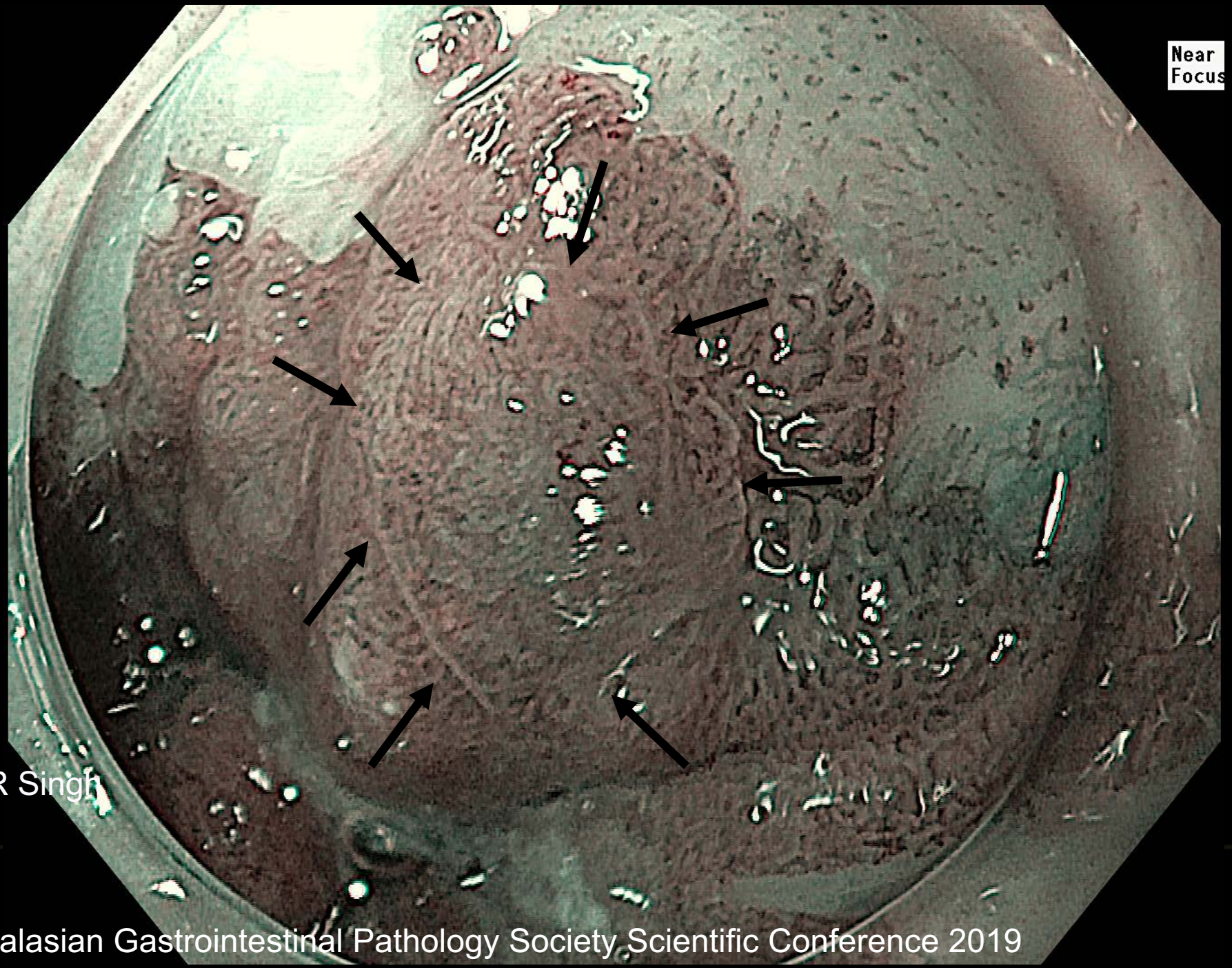

Near
Focus
R Singh
LGD

# BE: Unanswered by Mucosal Imaging

- Squamous tissue overgrowth
- LGD
- HGD vs intramucosal/superficial submucosal cancer : margins and depth


Near
Focus
R Singh
IMC


Near
Focus
R Singh

# Pushing the boundaries: ESD in BE

- Lesions >1.5cm
- Nodular, depressed
- Lesion which are difficult to lift
- Lesions suspected of harboring superficial submucosal invasion

# Risk of LN mets into Sm: metanalysis

| | $SM_1$ | $SM_2$ | $SM_3$ |
|---|---|---|---|
| Lymph Nodes | 8/84 (10%) | 11/53 (36%) | 38/80 (49%) |
| LV invasion | 2/23 (9%) | 4/15 (27%) | 19/25 (76%) |
| Vascular invasion | 1/7 (14%) | 0/2 (0%) | 0/12 (0%) |

Adapted from G Sgourakis et al. WJG 2013

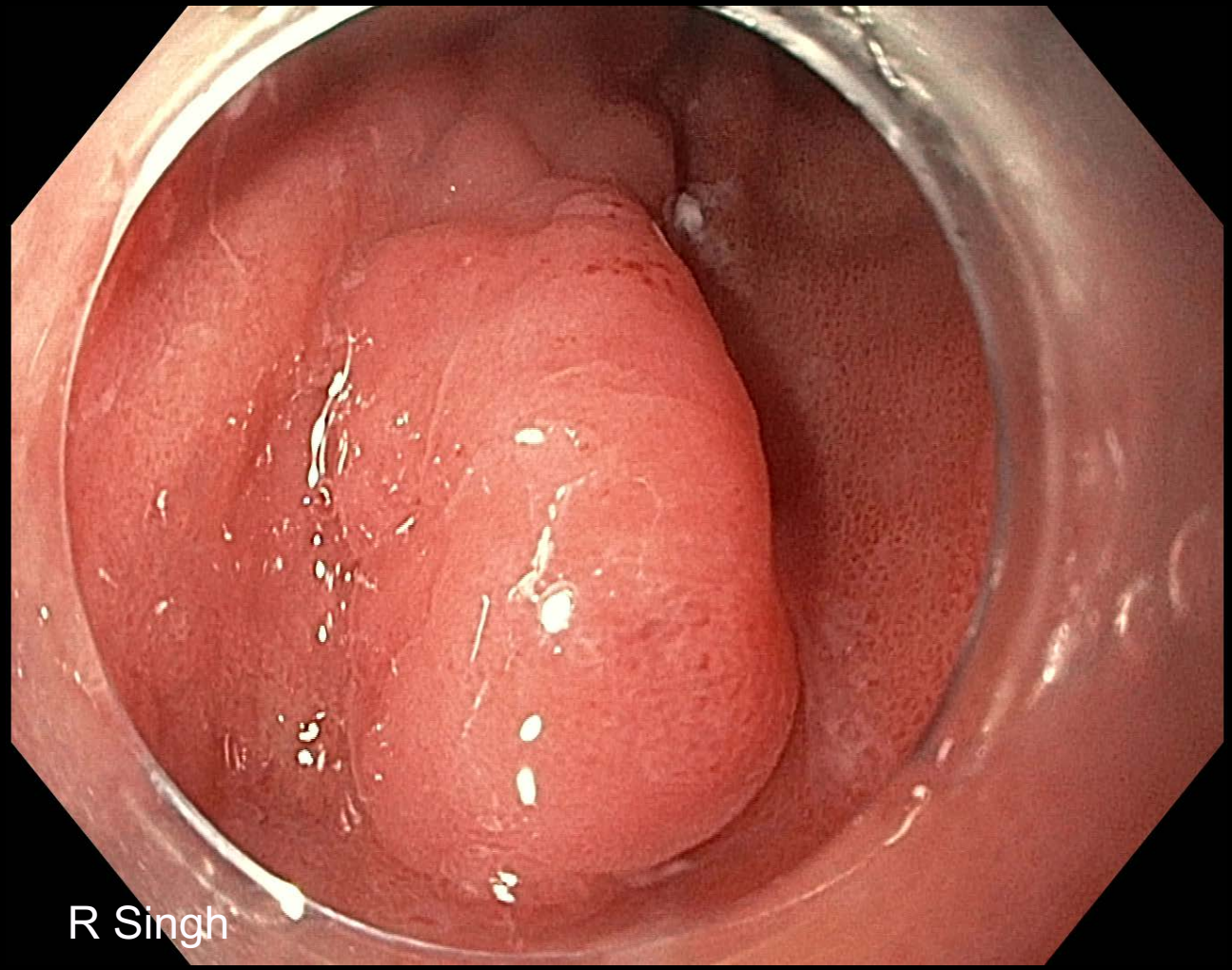
# ESD – advantages and challenges

## ADVANTAGES

- Straight lumen (less problems with folds)
- Repetitive once familiar
- Gravity, friendly if lesion is between 1-6 o'clock

## CHALLENGES

- Narrow lumen of the oesophagus (scope maneuverability)
- Resected specimen retracts distally
- Vascular GOJ
- Thin wall of oesophagus (thicker mucosa, but thin MP..beware thinking it is thick ..POEM's)
- Gravity, unfriendly if lesion is between 7-12 o' clock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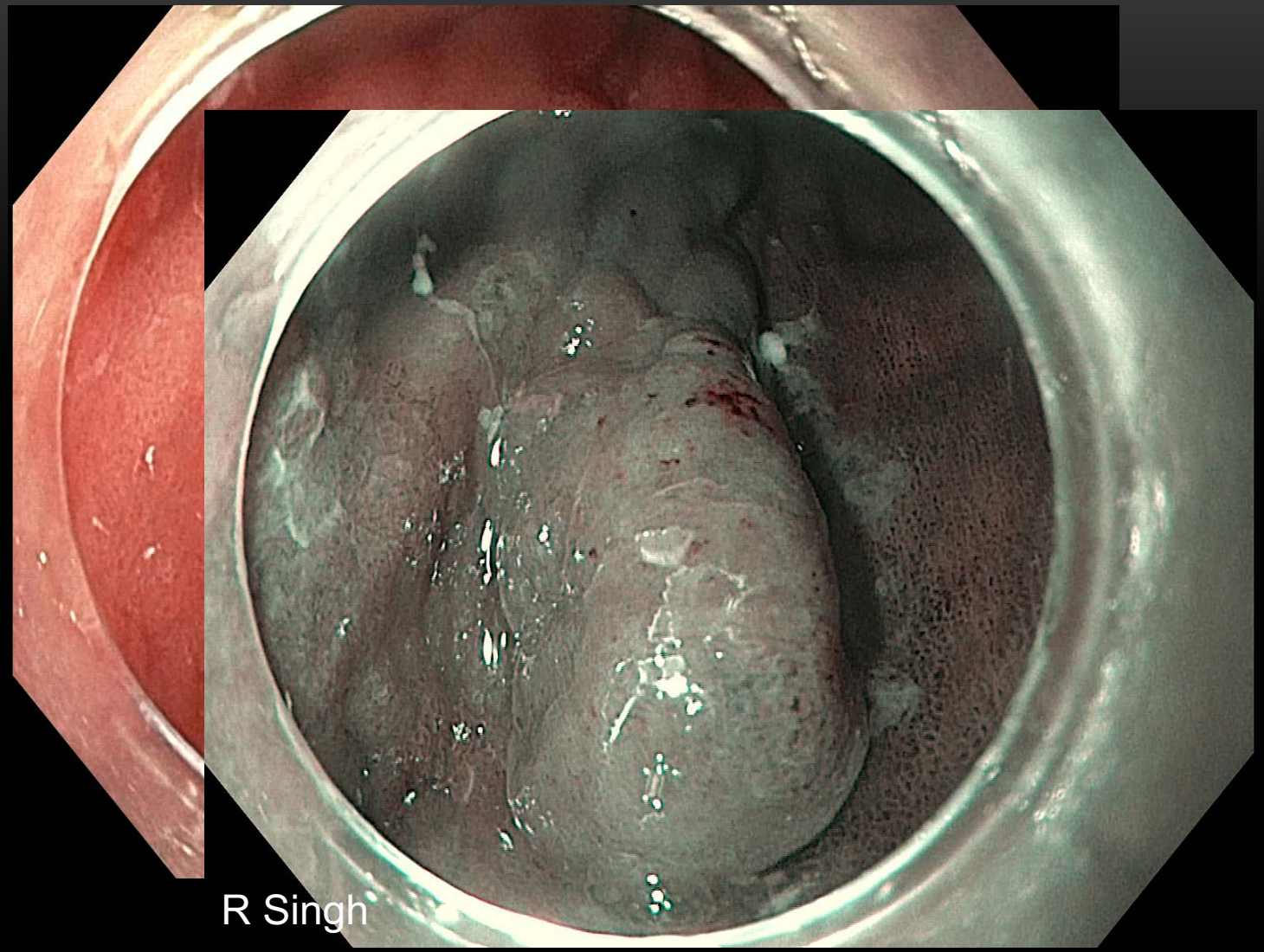
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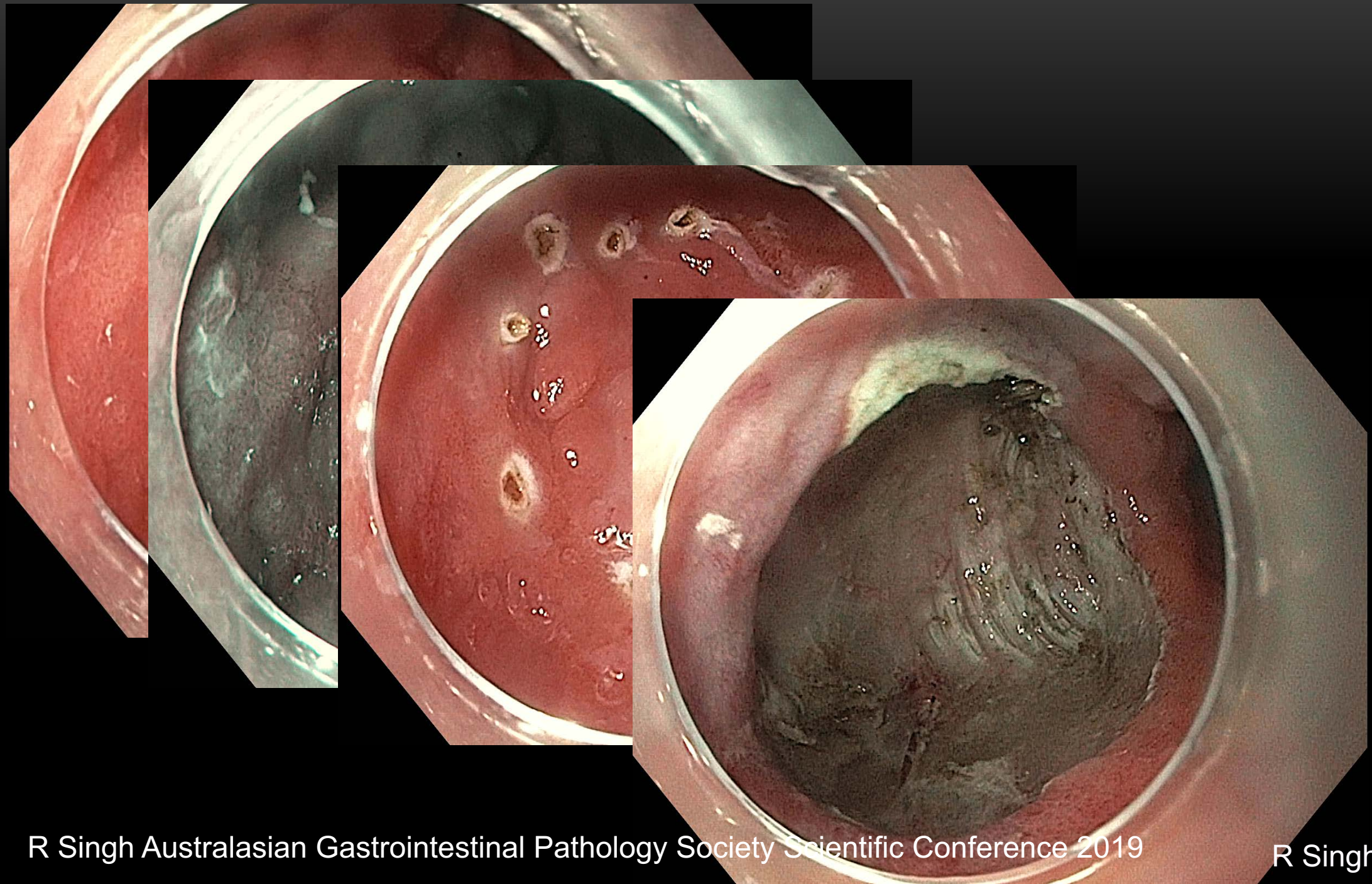

# ESD in BE

| Author | Year | # Patients | En bloc | Ro | Perf | Recurrence |
|---|---|---|---|---|---|---|
| Yang, Draganov GIE 2017 | 2010-2015 | 46 | 96% | 76% | 2% | |
| Subramaniam, Bhandari GIE 2017 | 2008-2016 | 143 | 91% | 79% | 0% | |
| Terhaggen, Neuhaus GUT 2017 | 2017 | 20 (EMR) vs 20 (ESD) | | 58% | 10% | 0% vs 5% |
| Bhatt DDW 2019 | 2019 | 155 (EMR) vs 74 (ESD) | 41% vs 95% | | | 39% vs 3% |

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# BE: Pushing the boundaries

2. Complete BE excision – single session

# BE: What Gastroenterologists need

- Further clarity: LGD and indefinite for dysplasia, atypia?
- Depth of invasion into mucosa/submucosa (um) and risk of LN mets
- “Volume” of cancer and risk of LN mets

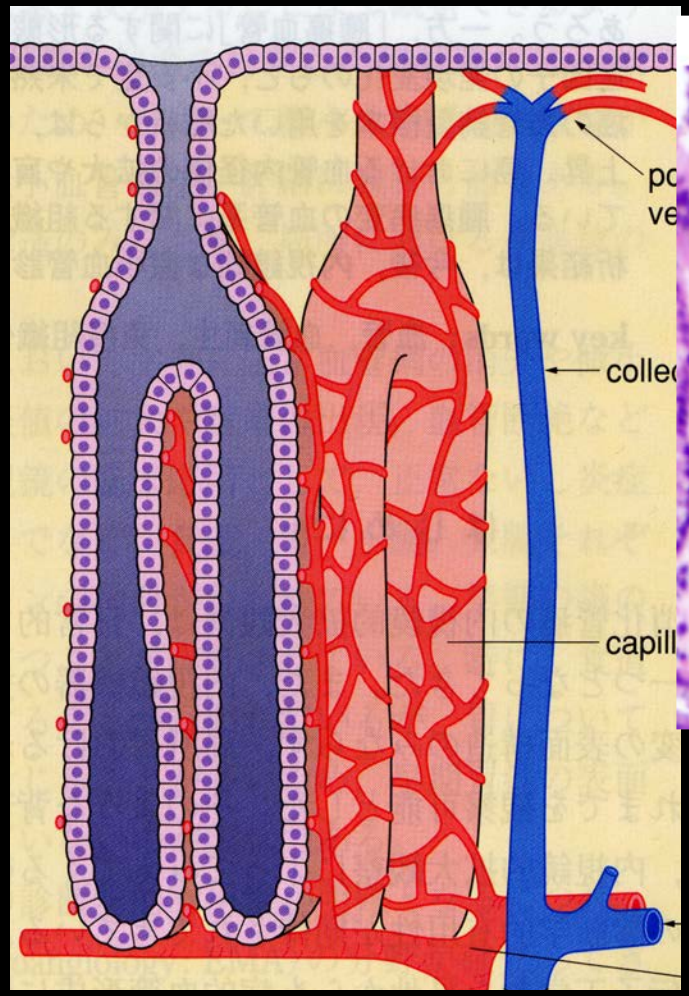
# Overview

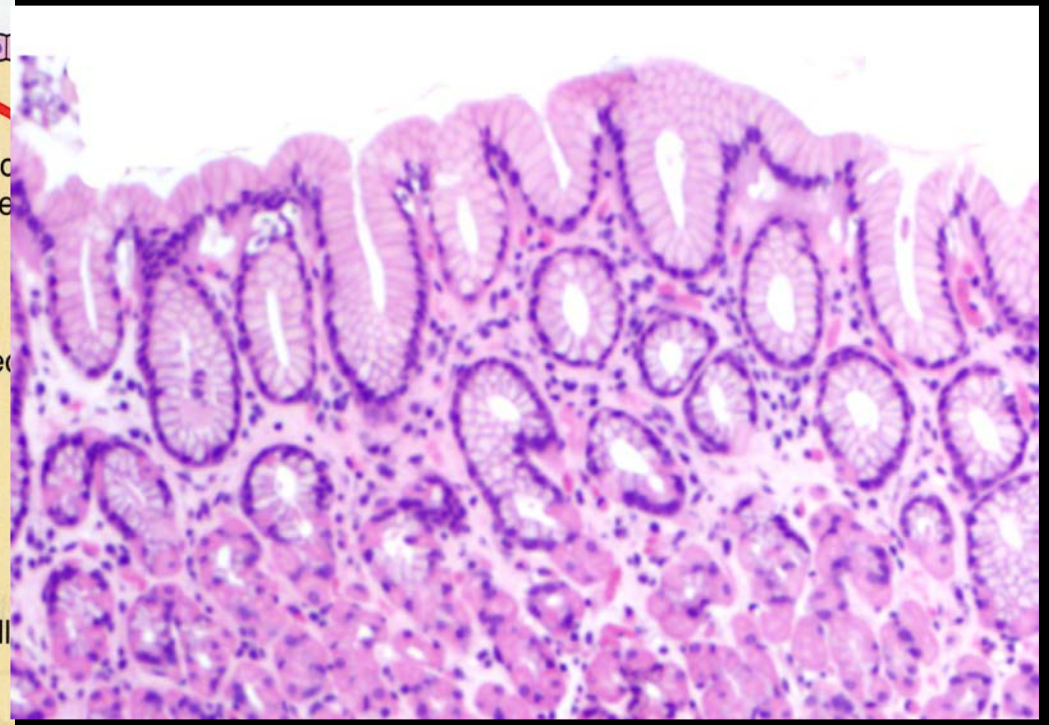
- Oesophagus
- Stomach
- Colon

# Characterization

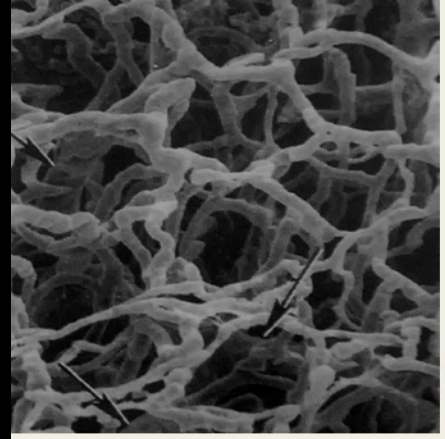
- With NBI (BLI/I Scan) +/- magnification
- What is normal ?

# Anatomy
# (gland structure and vasculature) of the corpus



Whtiehead R. Gastrointestinal and Oesophageal Pathology



# BODY

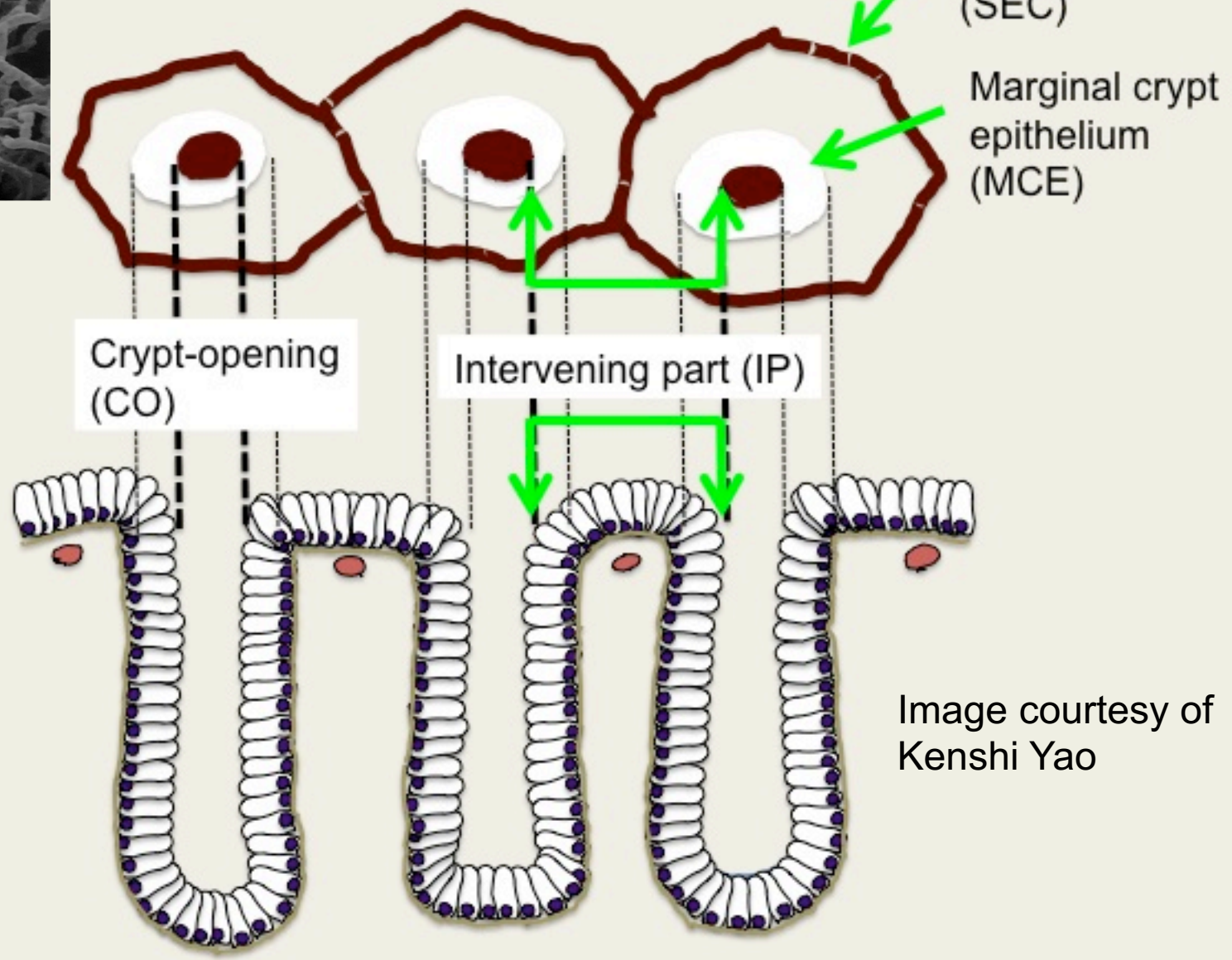
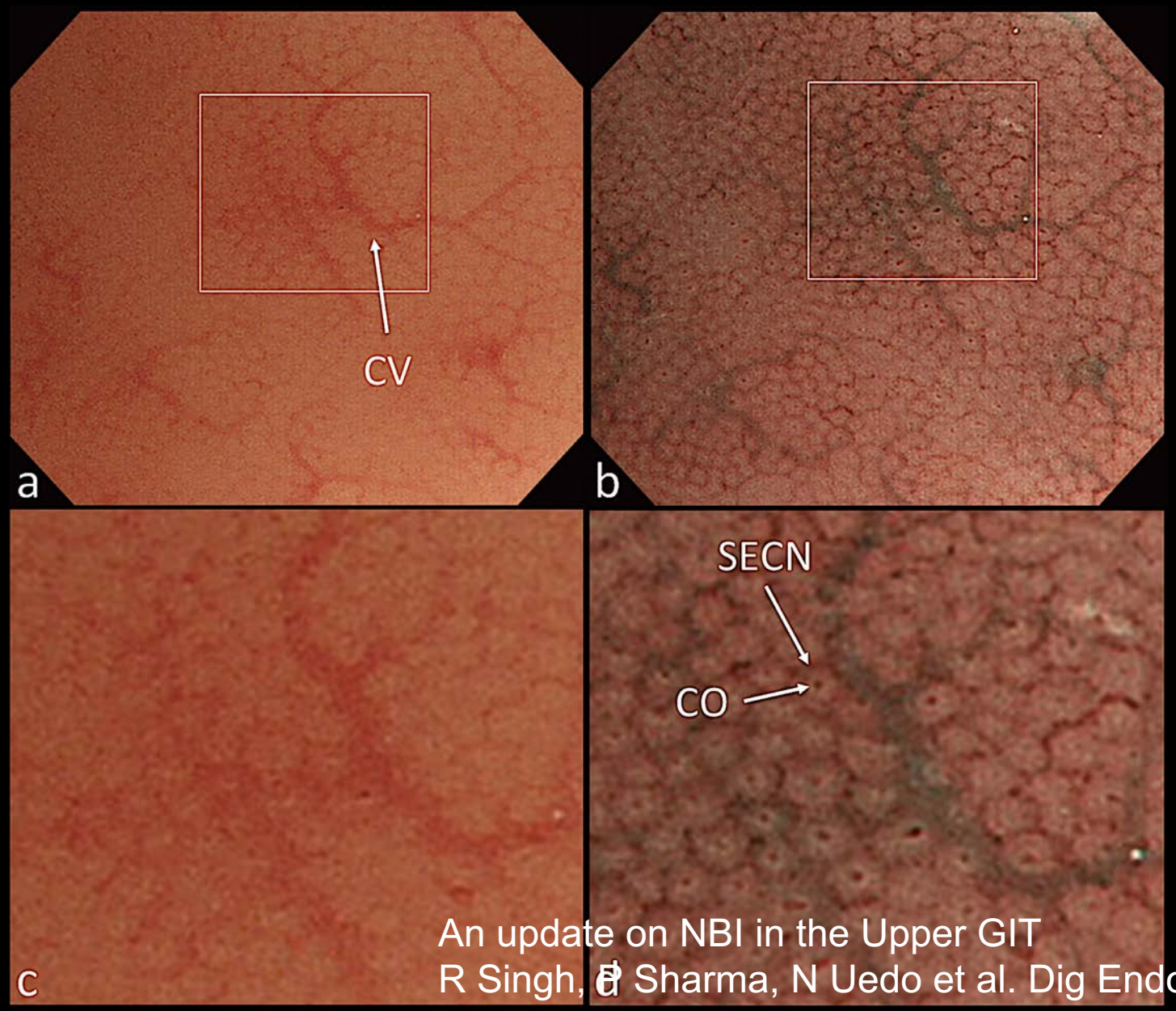
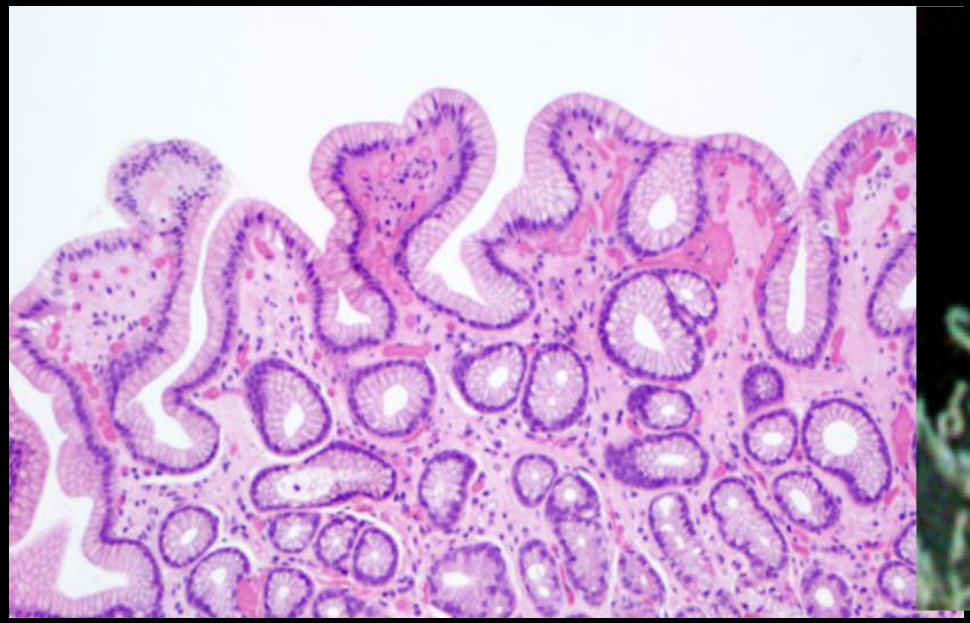


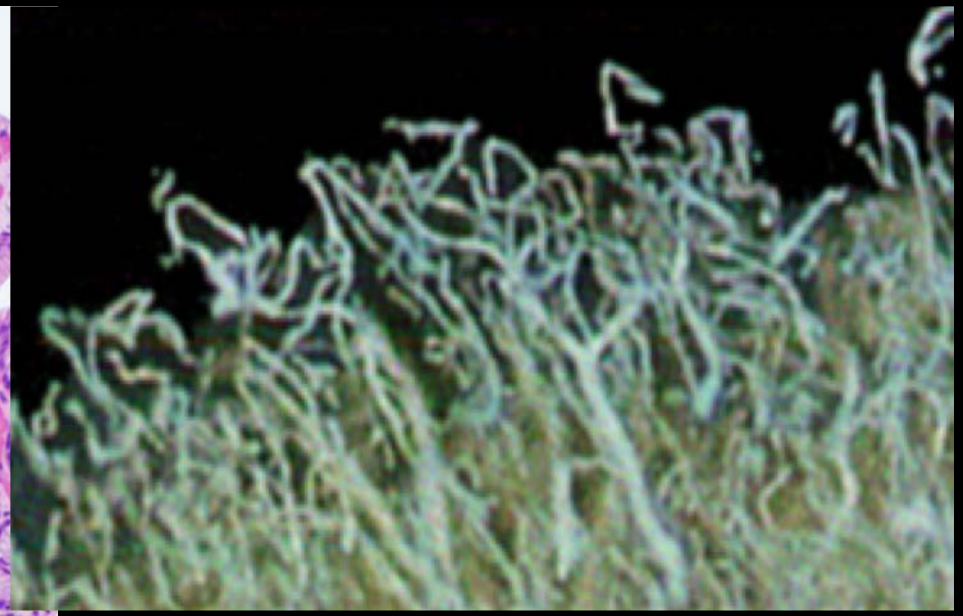

Image courtesy of Kenshi Yao




An update on NBI in the Upper GIT
R Singh, D Sharma, N Uedo et al. Dig Endo 2013

# Anatomy : Antrum





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Whtiehead R. Gastrointestinal and Oesophageal Pathology

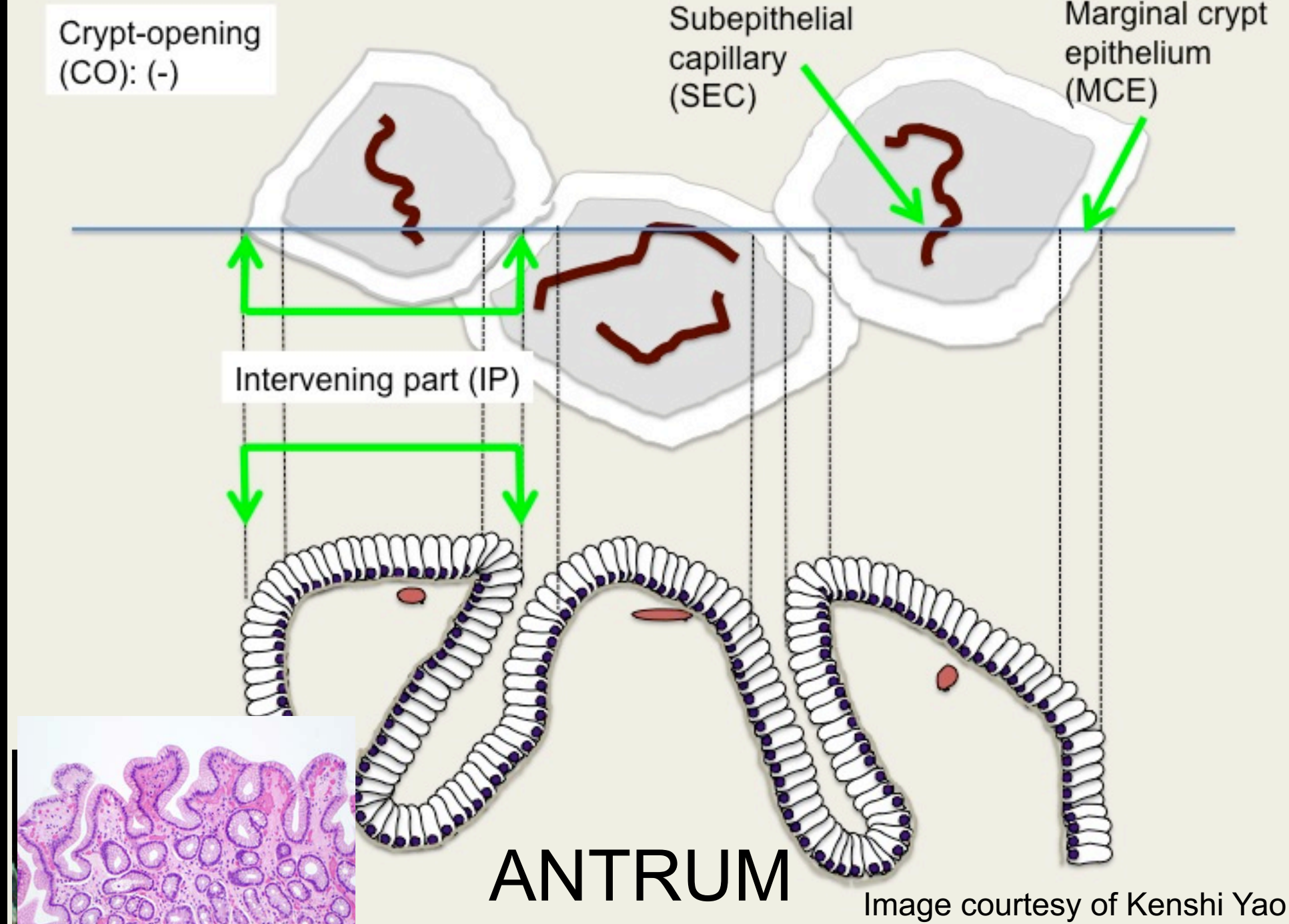
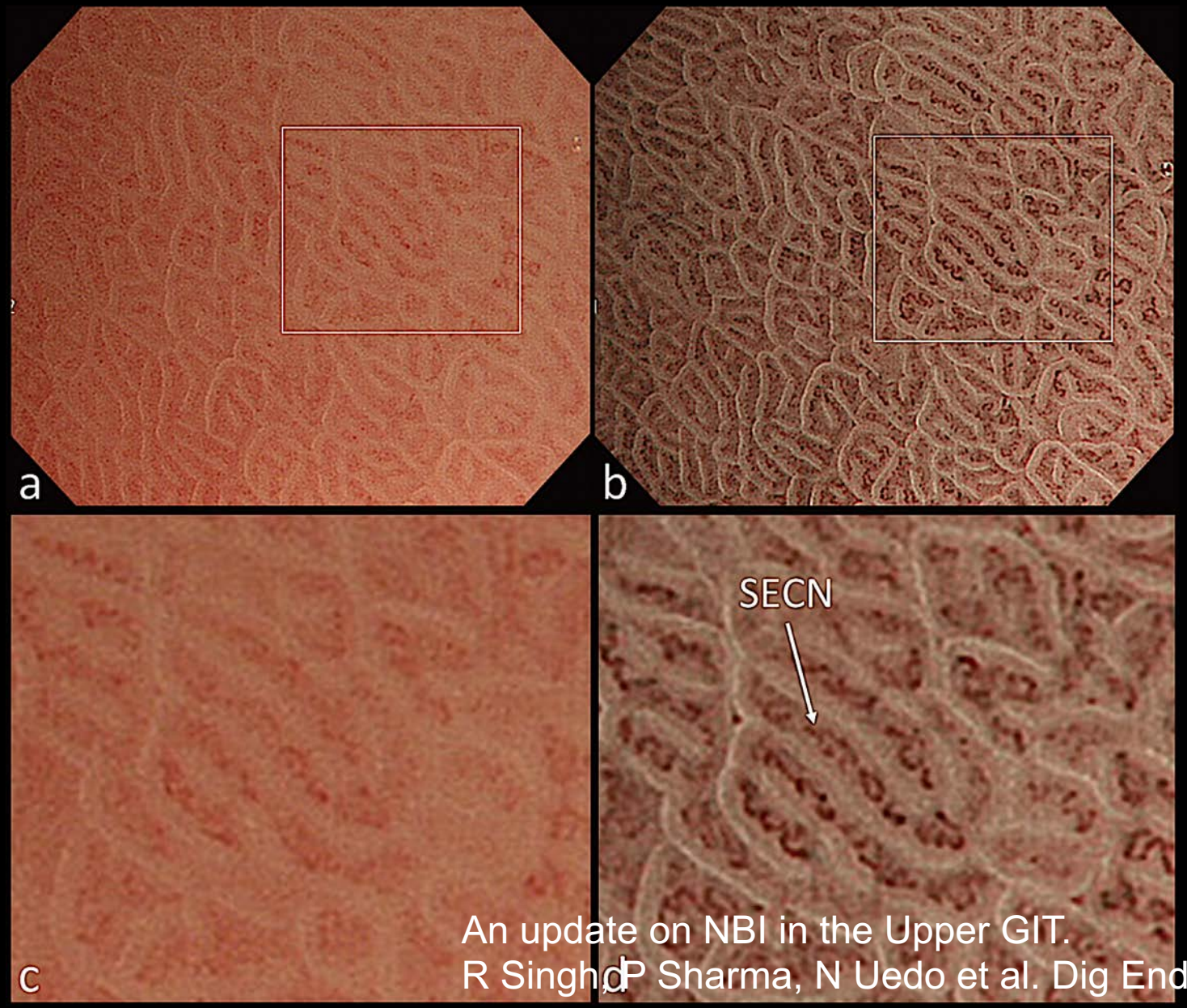



Image courtesy of Kenshi Yao




An update on NBI in the Upper GIT.
R Singh, P Sharma, N Uedo et al. Dig Endo 2013

# Premalignant gastric lesions

- Gastric IM is considered premalignant
- Annual incidence of gastric cancer
  - Atrophic gastritis 0.1%
  - Intestinal metaplasia 0.25%
  - Mild to mod dysplasia 0.6%
  - Severe dysplasia 6%

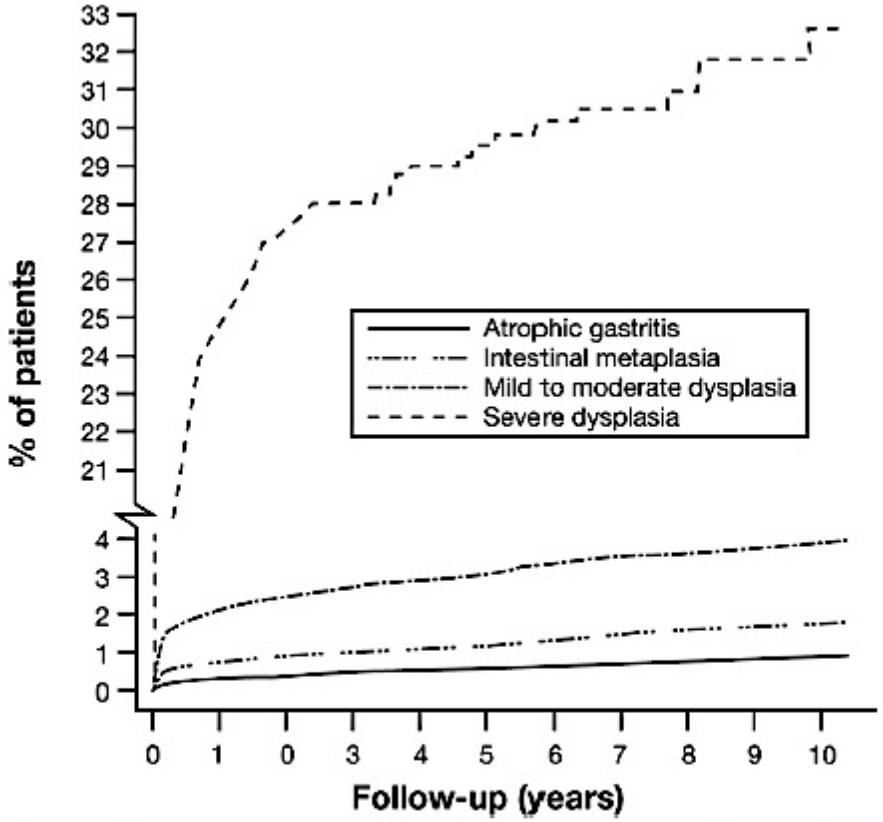
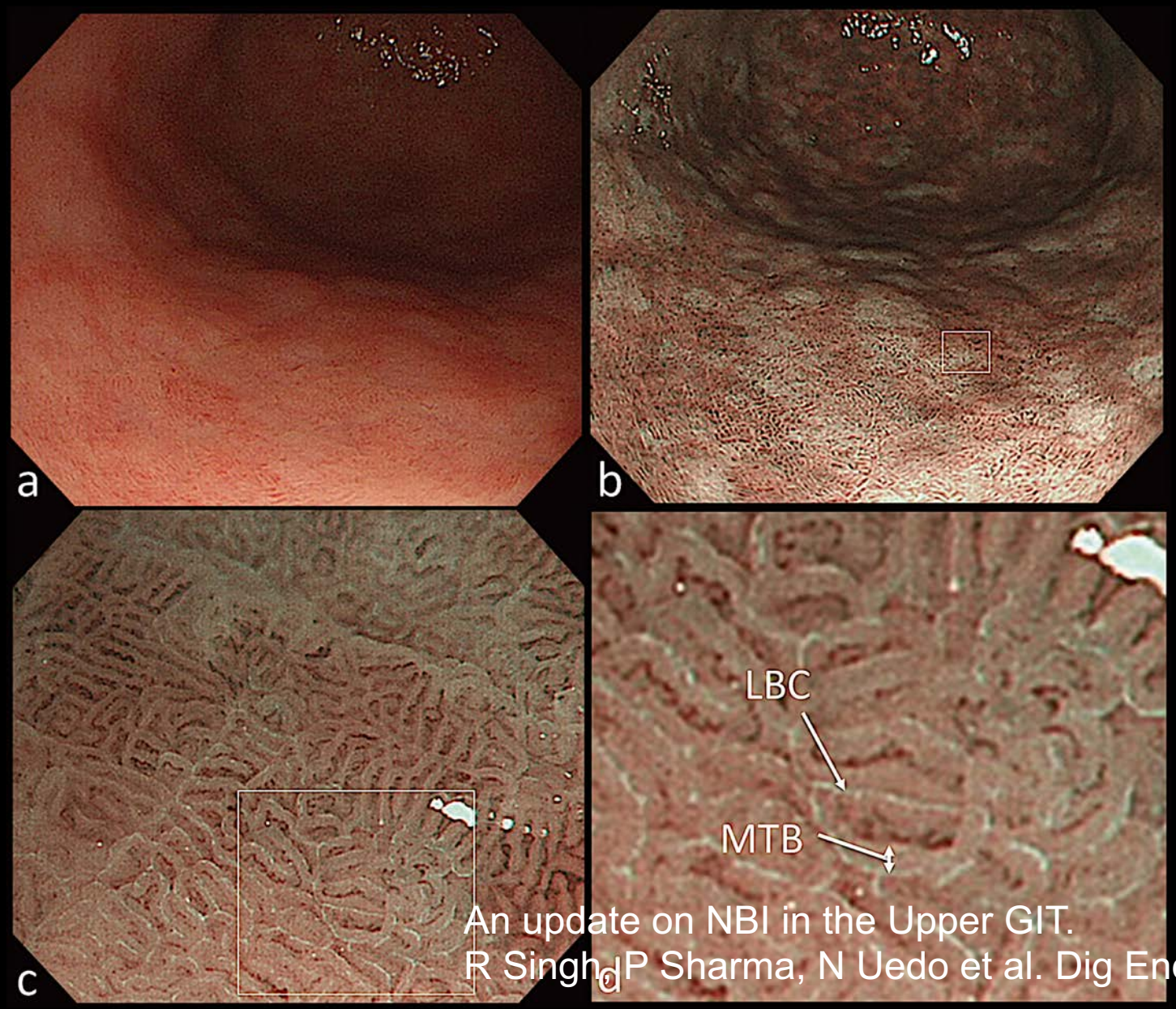
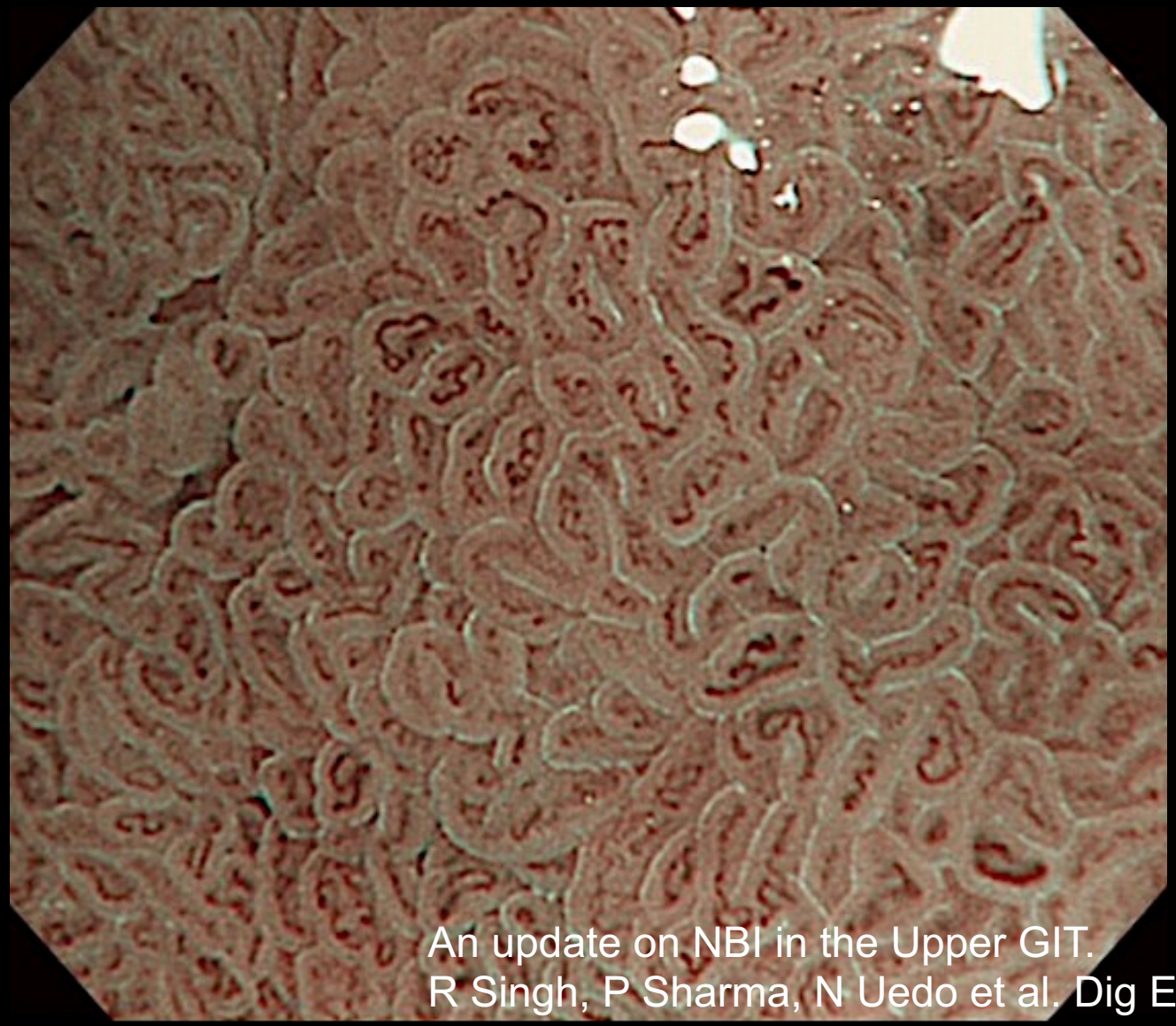



**Figure 5.** Progression rate of premalignant gastric lesions to gastric cancer in 92,250 patients with premalignant gastric lesions (90,780 censored patients).

De Vries et al Gastro 2008




An update on NBI in the Upper GIT.
R Singh, P Sharma, N Uedo et al. Dig Endo 2013



An update on NBI in the Upper GIT.
R Singh, P Sharma, N Uedo et al. Dig Endo 2013

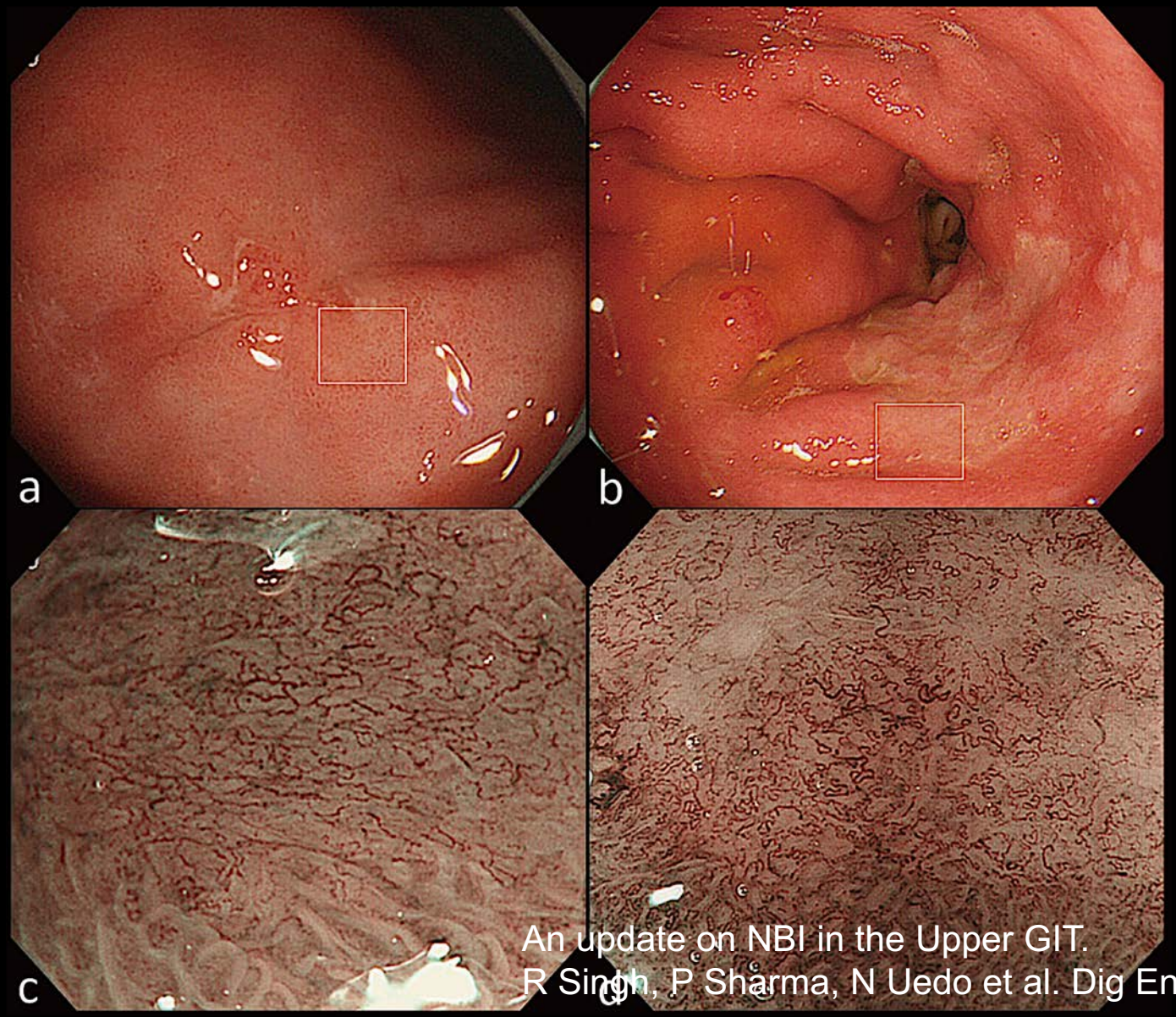
# EGC
# (VS classification)

Irregular microvasculature (V)

Irregular microstructure (S) with

Demarcation line (DL)

Yao et al Endoscopy 2009; 41:462- 67
Uedo N, Fujishiro M, Goda K, Hirasawa D, Lee JH, Morita Y, Singh R et al.
Current Consensus of Experienced Endoscopists in the AP region.
Digestive Endoscopy 2011




An update on NBI in the Upper GIT.
R Singh, P Sharma, N Uedo et al. Dig Endo 2013

# Overview

- Detection
- Characterization
- Treatment (Endoscopic)

# Guidelines for ER

| | Histology | Size | Depth | Ulcer |
|---|---|---|---|---|
| Esophagus | SCC | ≤2/3 circumferential | M1 (intraepithelial)<br>M2 (lamina propria) | |
| | | 2/3>circumferential | M1 (intraepithelial)<br>M2 (lamina propria) | |
| | | ≤2/3 circumferential | M3 (muscularis mucosae)<br>SM ≤200 μm | |
| STOMACH | Differentiated | Any size | M | (-) |
| | | ≤3 cm | M | (+) |
| | | ≤3 cm | Upto SM ≤500 μm | (-) |
| | Undifferentiated | ≤2 cm | M | (-) |
| Colon | | ≤2 cm: EMR<br>>2 cm: ESD/WF EMR | Upto SM ≤1000 μm | |

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# Guidelines for ER

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# Guidelines for ER

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R Singh

R Singh

R Singh


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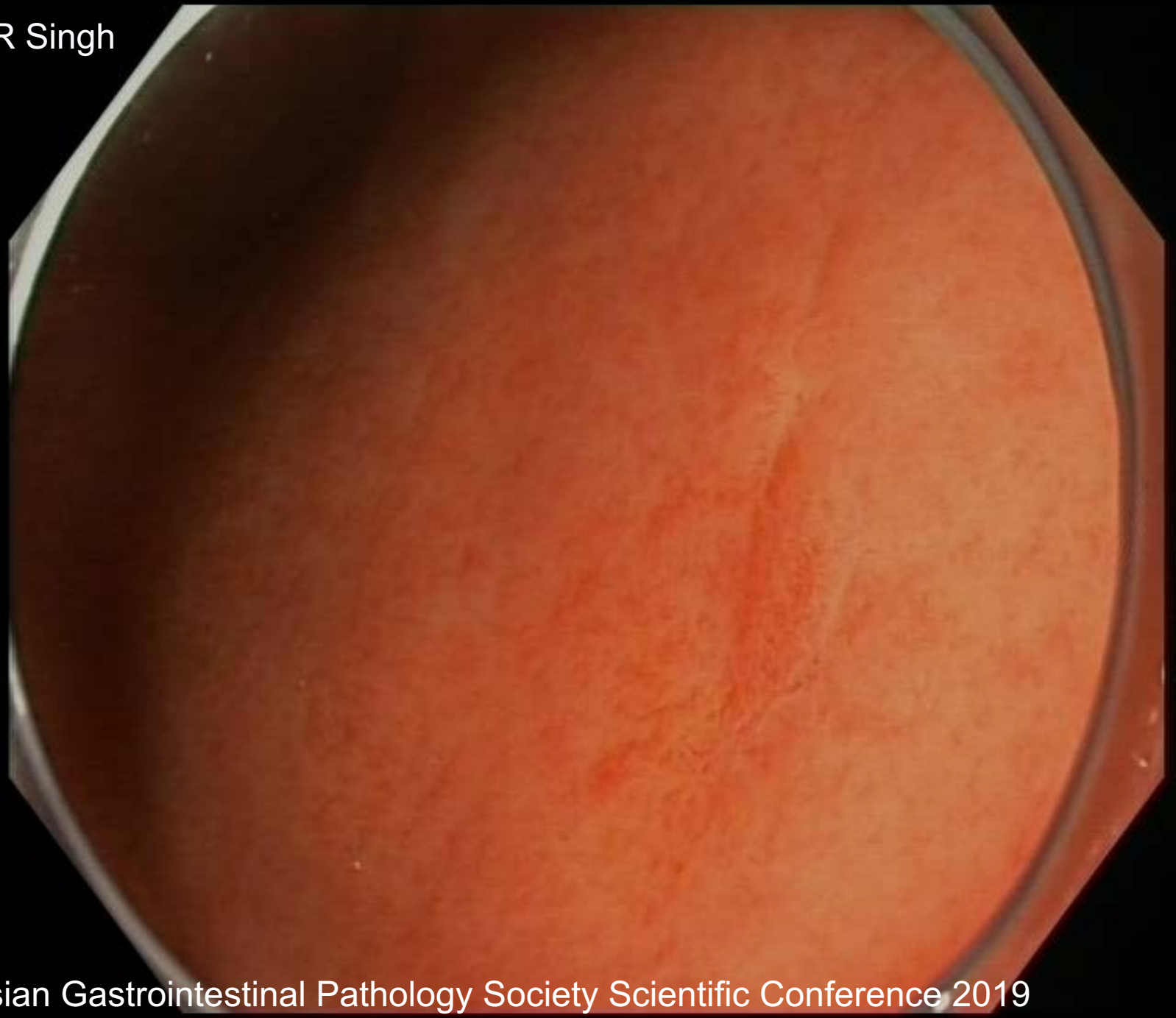
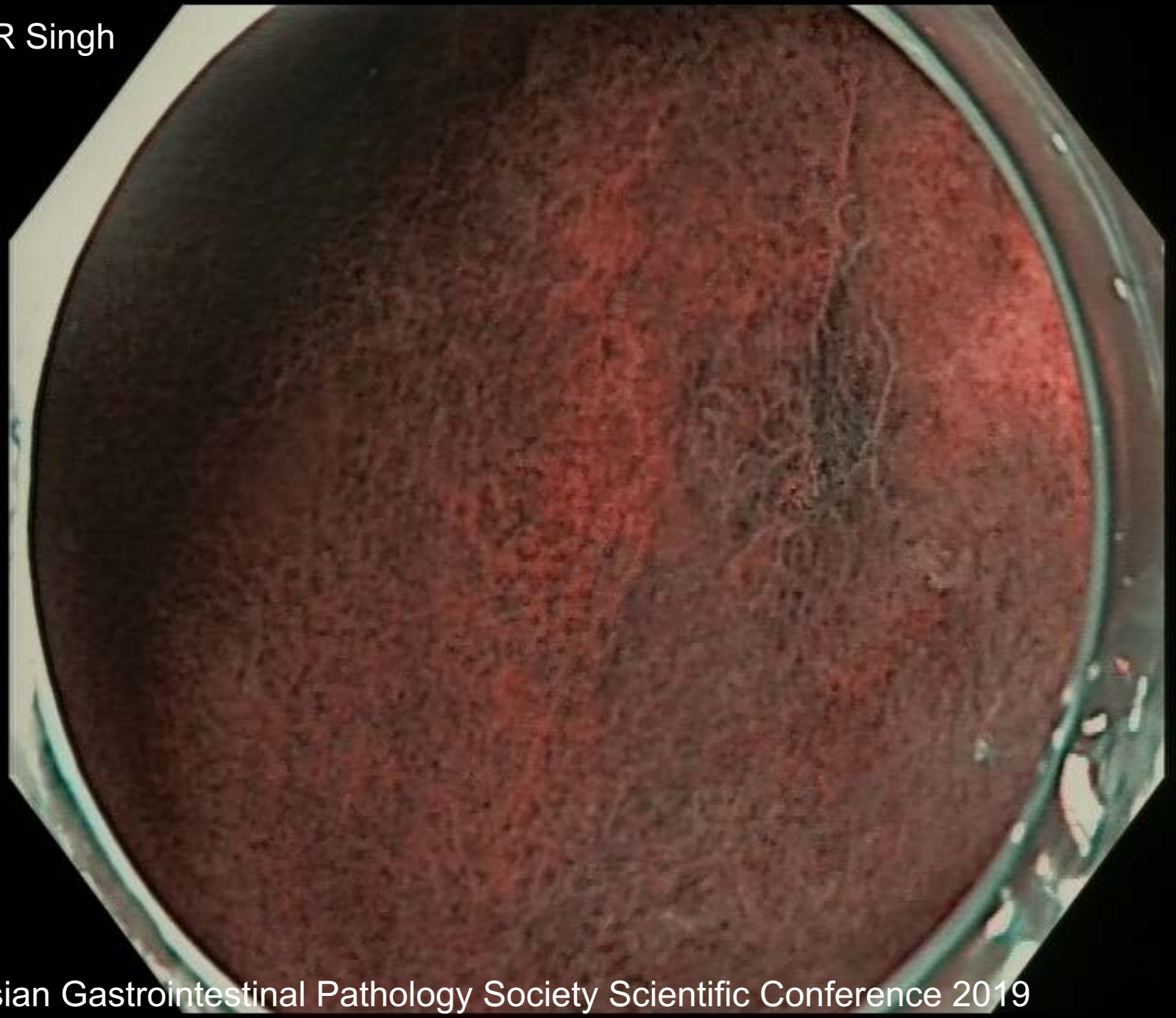
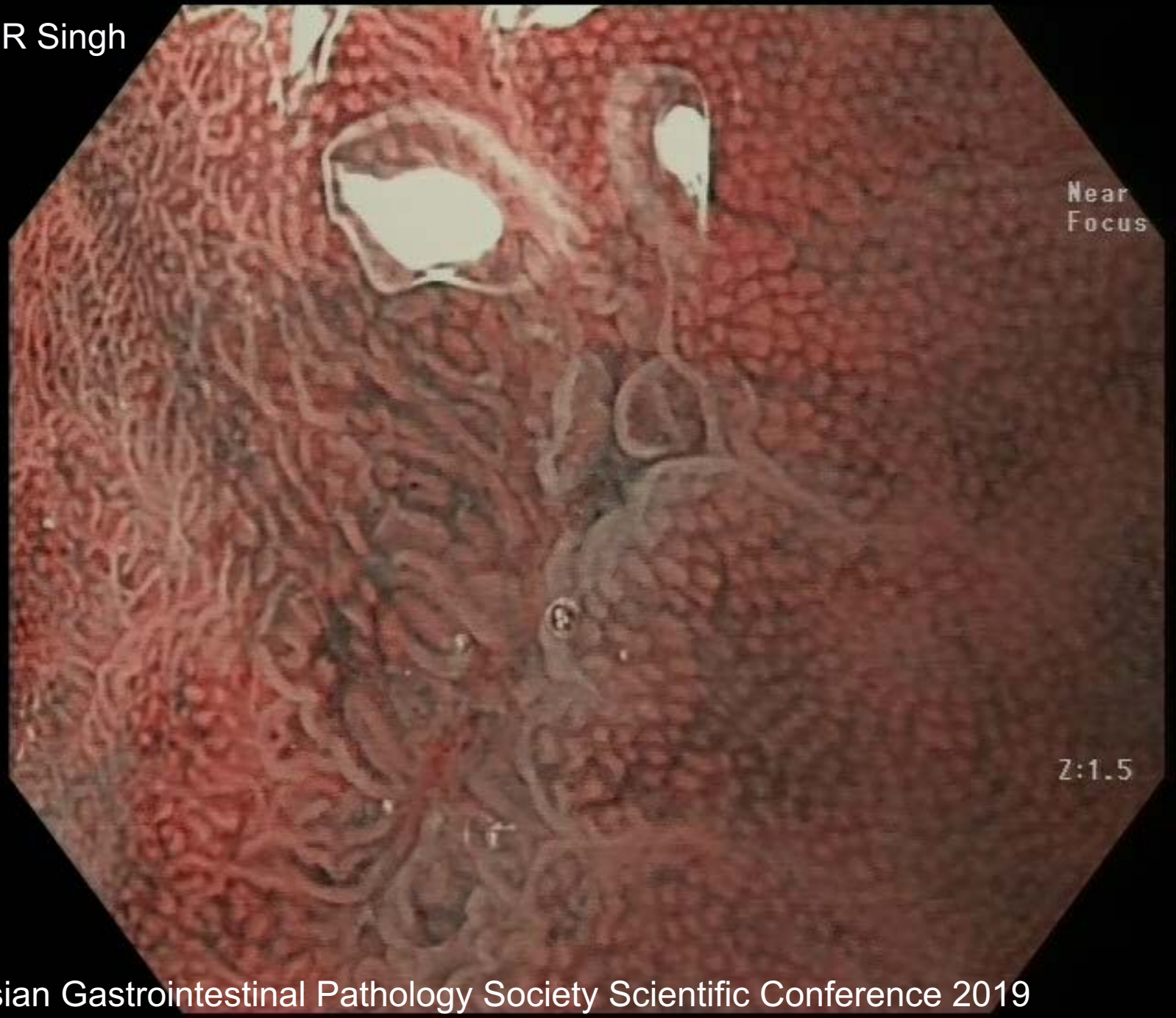
R Singh



R Singh



R Singh

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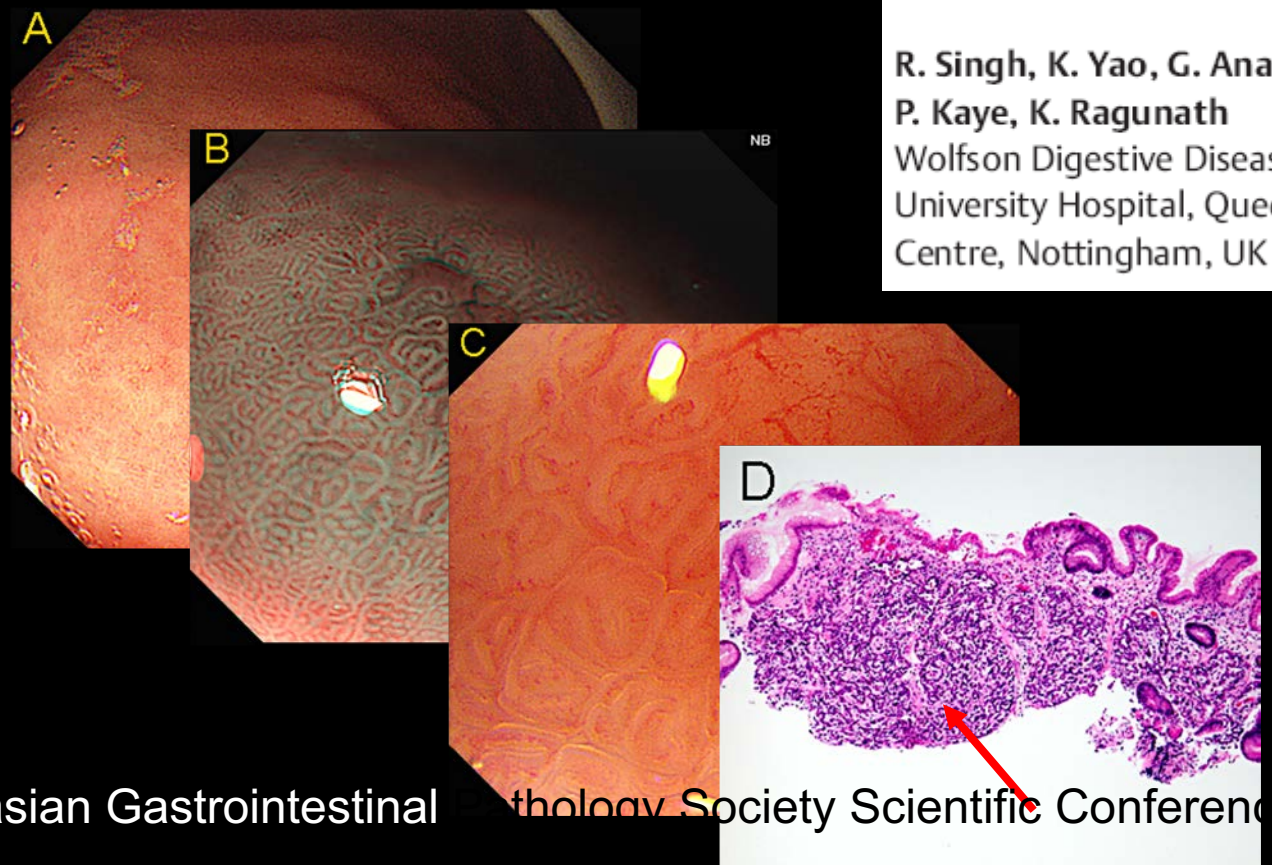
# Stomach: Microcarcinoid

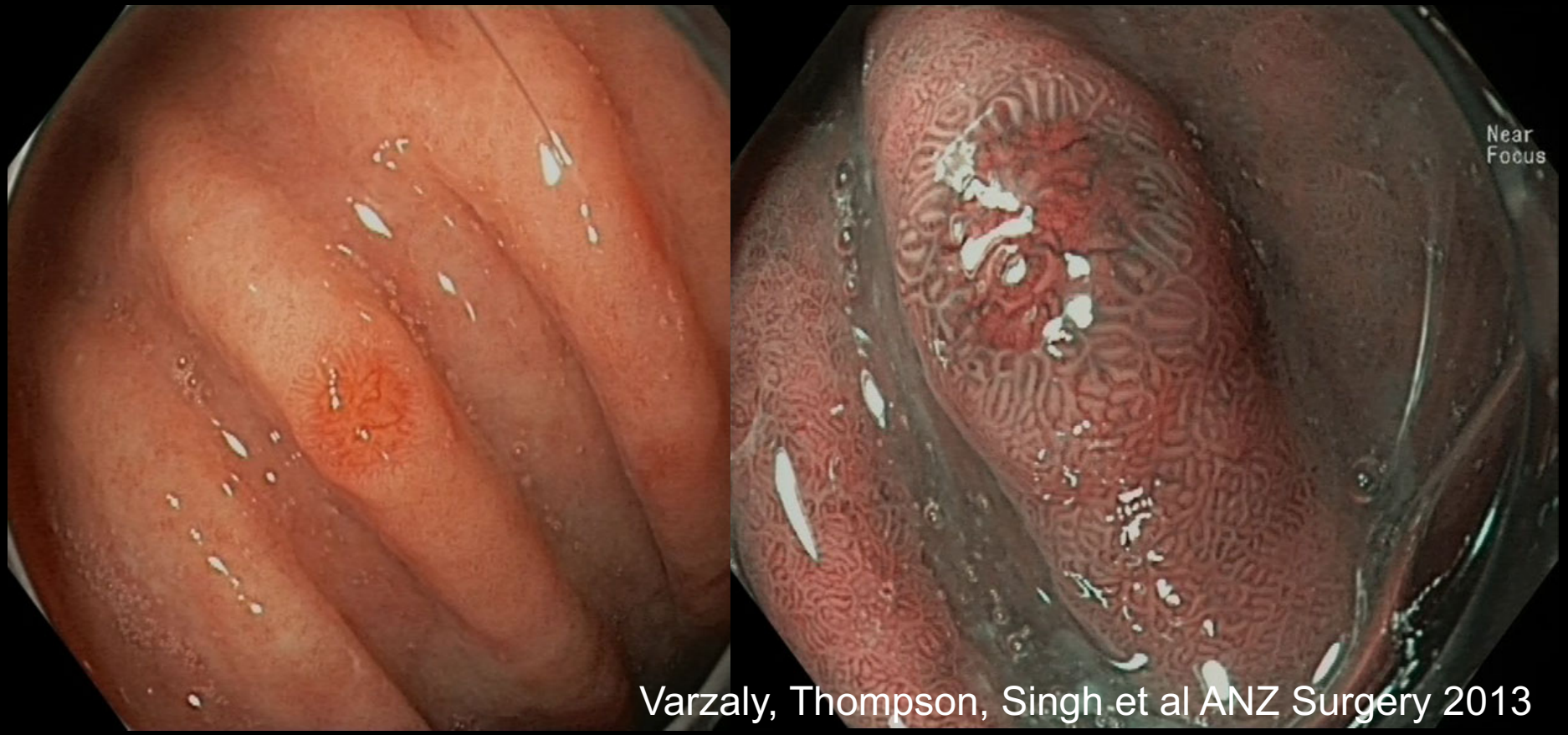
## Microcarcinoid tumor diagnosed with high-resolution magnification endoscopy and narrow band imaging

Endoscopy_UCTN_Code_CCL_1AB_2AD_3AB

**R. Singh, K. Yao, G. Anagnostopoulos, P. Kaye, K. Ragunath**
Wolfson Digestive Diseases Centre, University Hospital, Queen's Medical Centre, Nottingham, UK



# Carcinoid misdiagnosed as gastric cancer…




Varzaly, Thompson, Singh et al ANZ Surgery 2013

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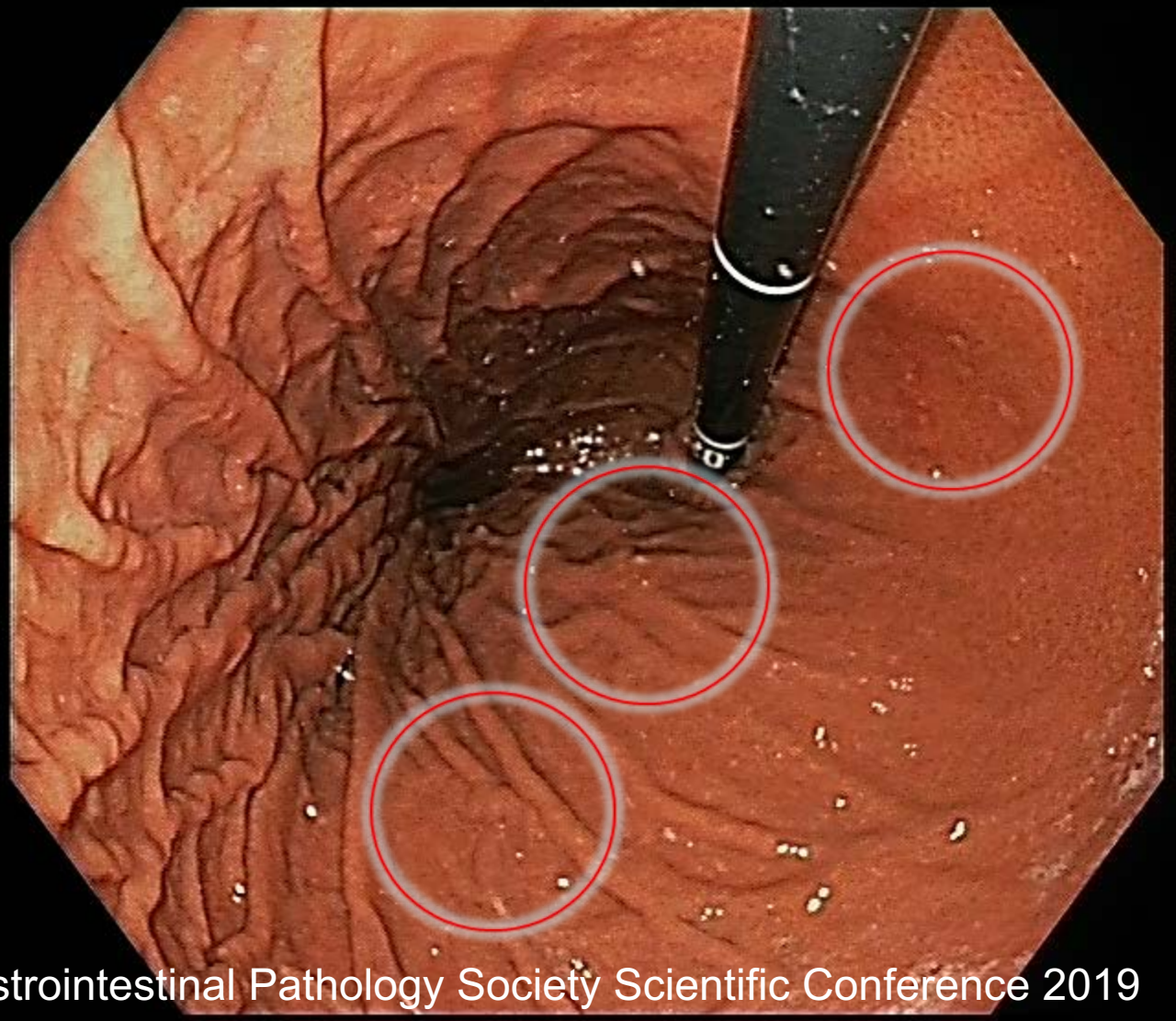

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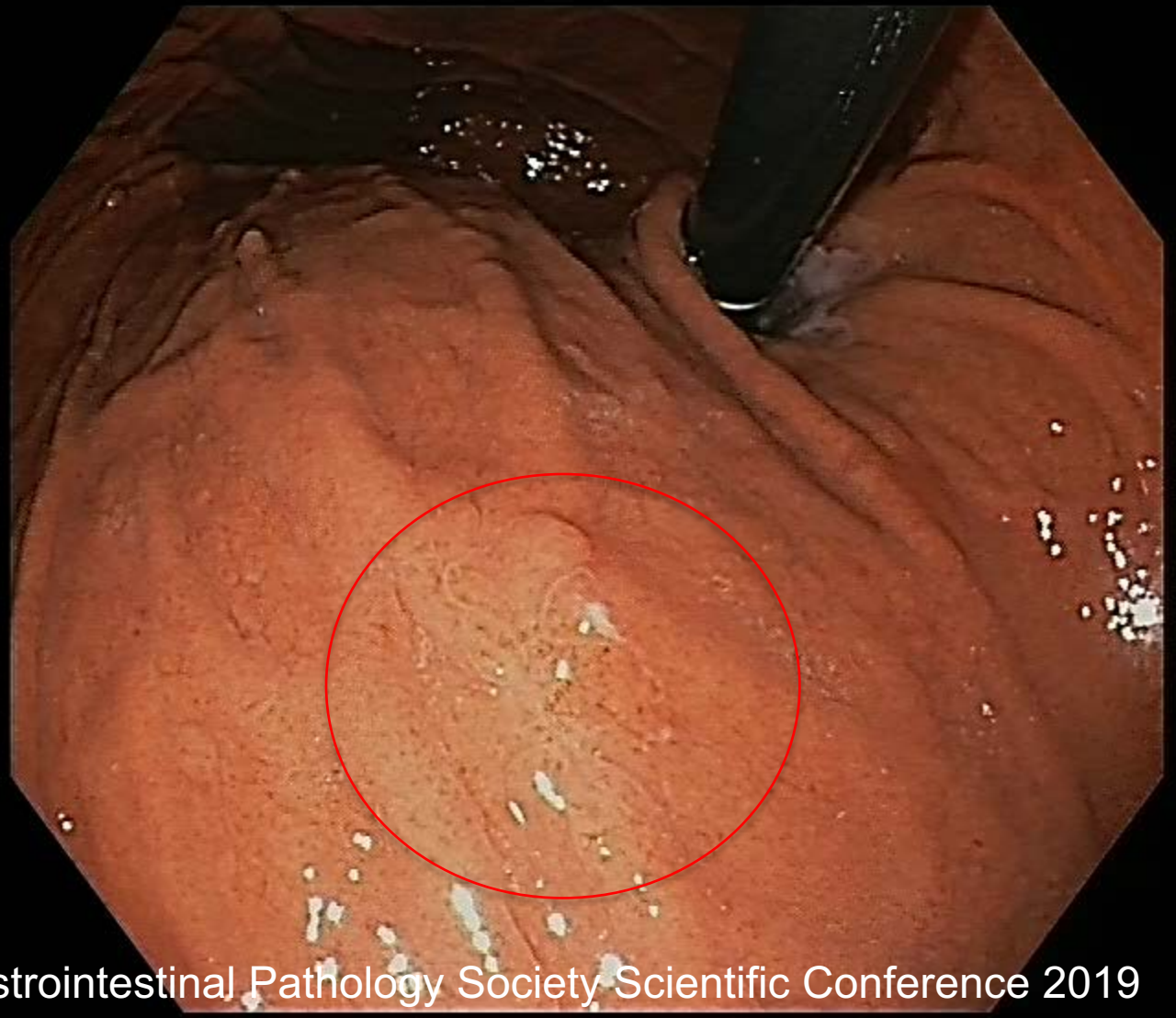


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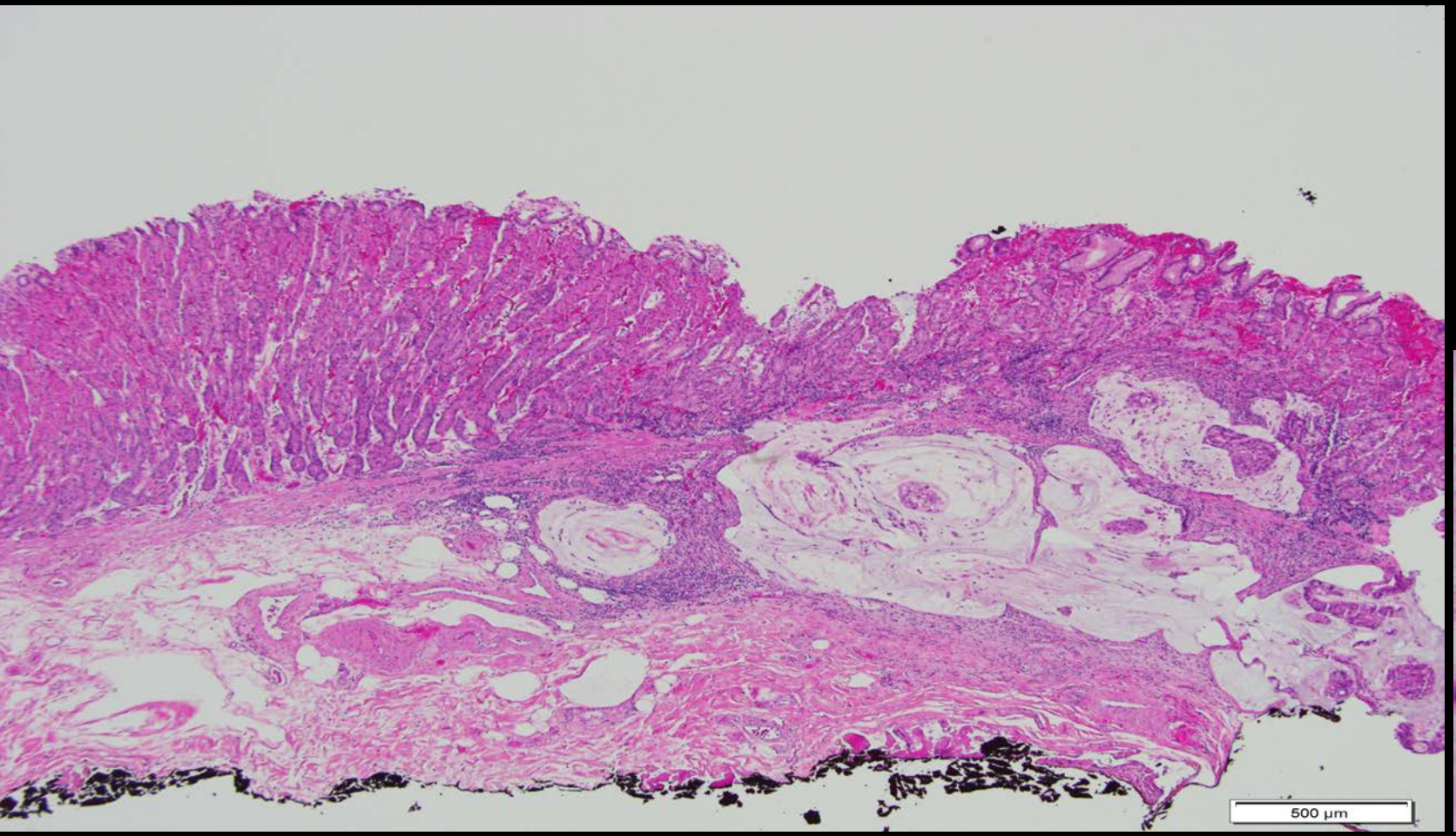
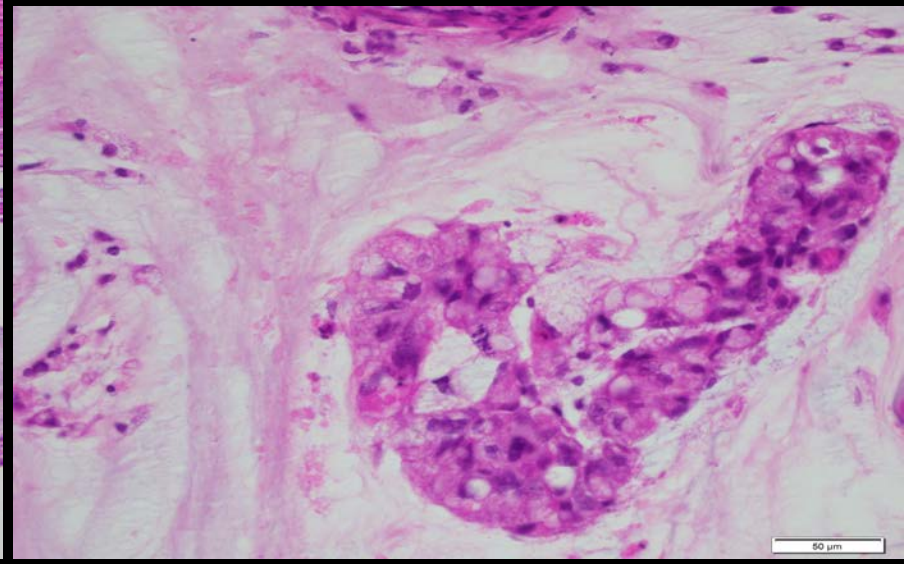
# Histopath



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# Overview

- Oesophagus
- Stomach
- Colon

# Colon

- Endoscopic Mucosal Resection (EMR)
- Full Thickness Resection (FTR)
- Endoscopic Submucosal Dissection (ESD)

# Colon

- EMR
- FTR
- ESD

# EMR- Nuances

1) Imaging: pre resection
2) Hot snare EMR
3) Cold snare EMR
4) Evaluate base : post resection
5) Preventing recurrence
6) Seeing recurrence on follow up

# EMR- Nuances

1) Imaging: pre resection - characterisation
2) Hot snare EMR
3) Cold snare EMR
4) Evaluate base : post resection
5) Preventing recurrence
6) Seeing recurrence on follow up

# Characterization

- Wide field view

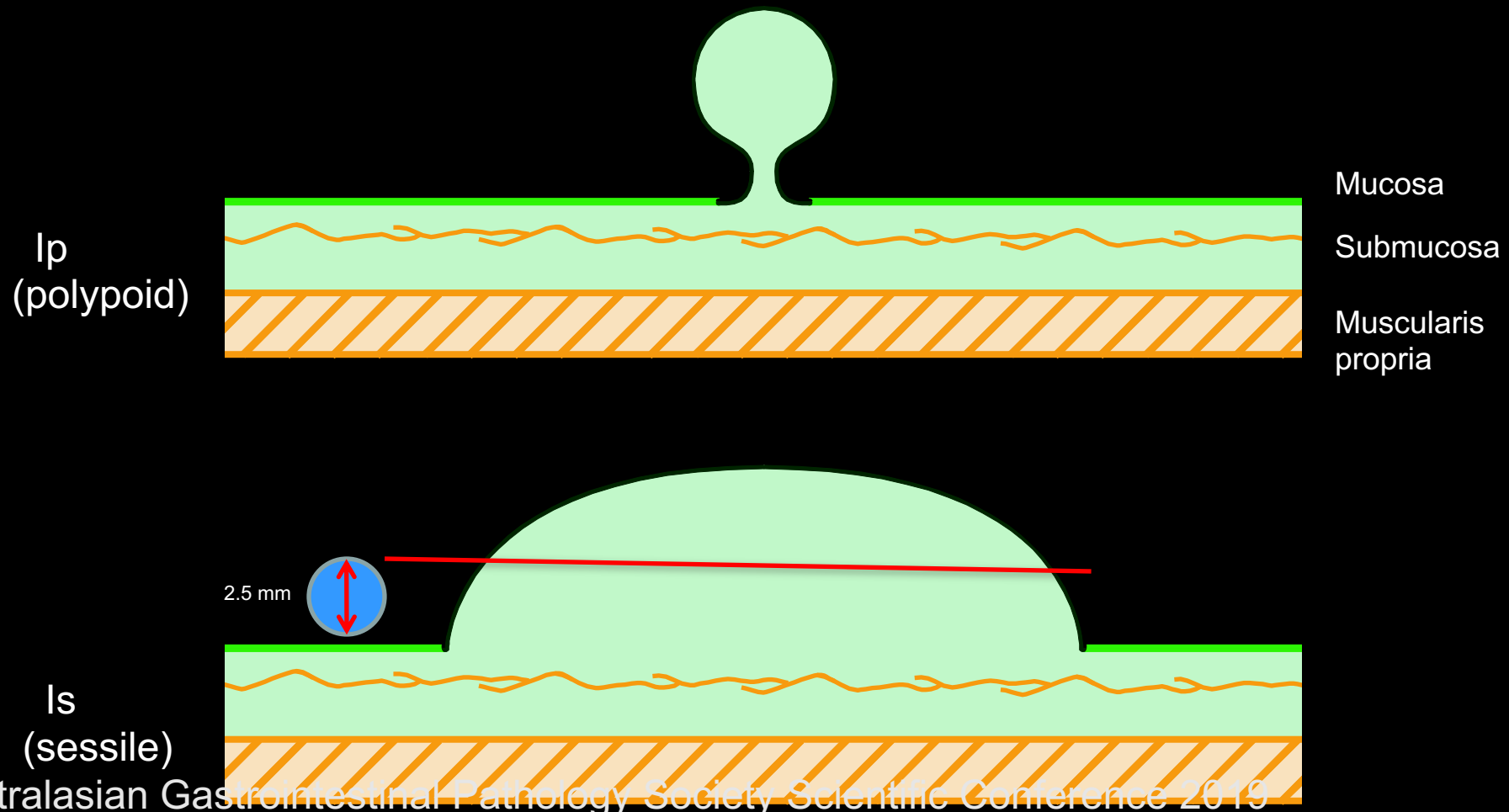
- Focal interrogation

# Characterization

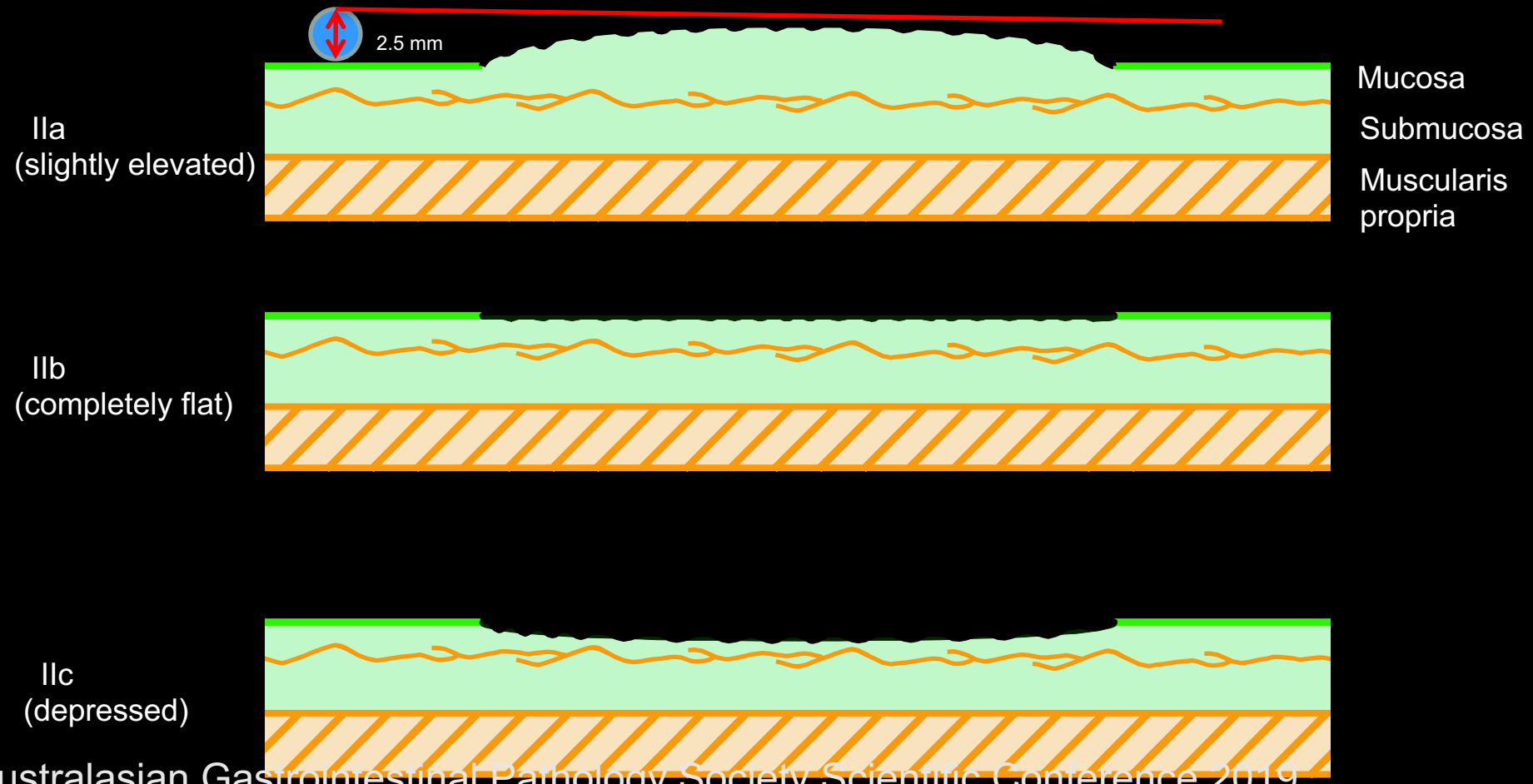
- Wide field view
- Paris classification
- Granularity

- Focal interrogation

# Paris classification
# Protruding lesions

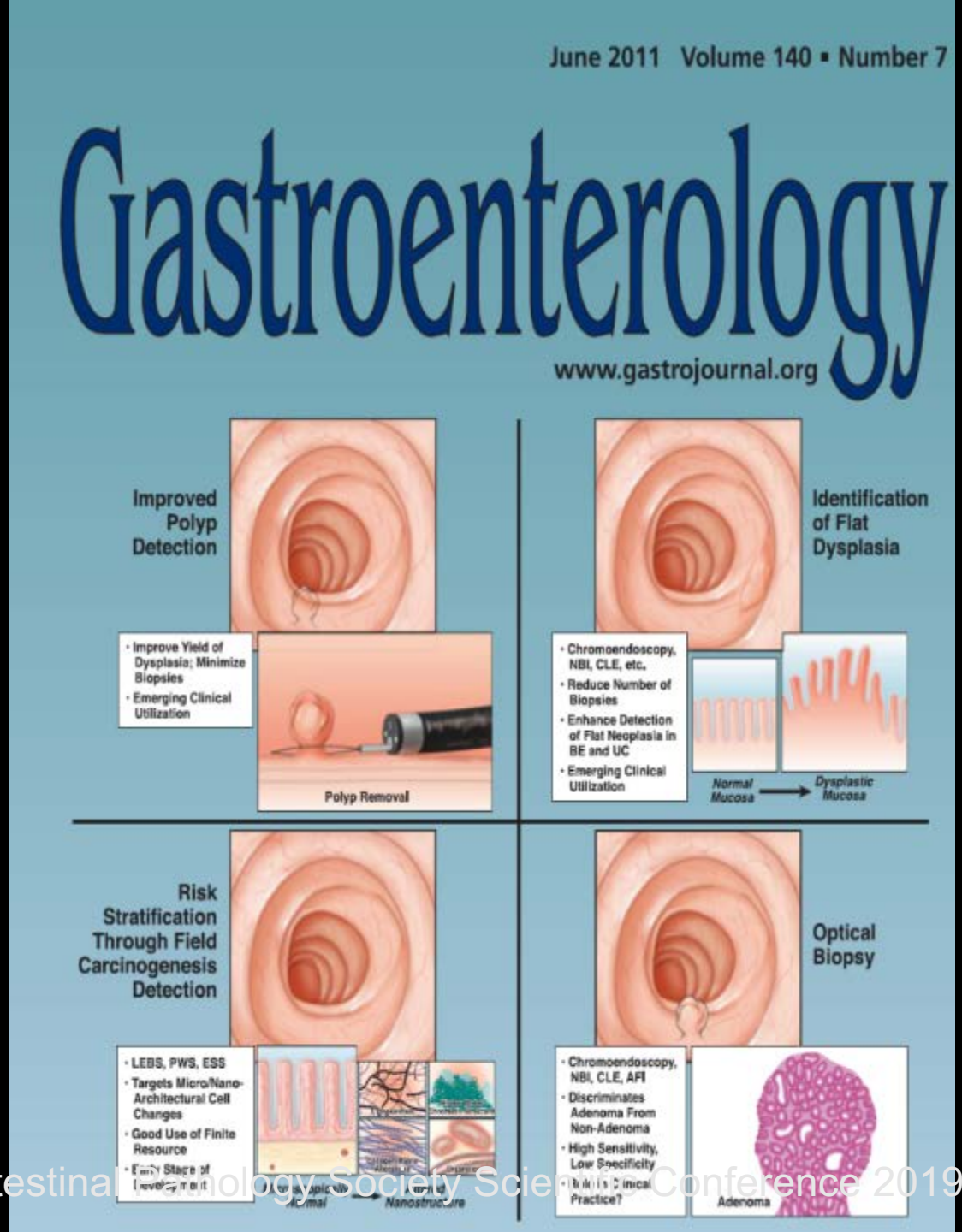


# Paris classification
# “Flat” lesions 0-II



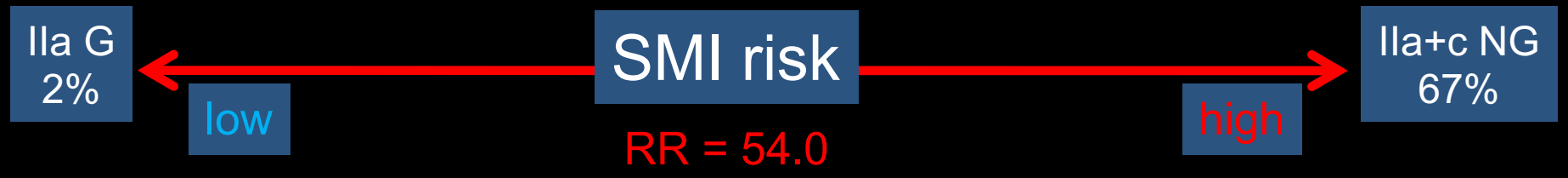
# Characterization

- Wide field view
- Paris classification
- Granularity


June 2011 Volume 140 ▪ Number 7
Gastroenterology
www.gastrojournal.org
Improved Polyp Detection
• Improve Yield of Dysplasia; Minimize Biopsies
• Emerging Clinical Utilization
Polyp Removal
Identification of Flat Dysplasia
• Chromoendoscopy, NBI, CLE, etc.
• Reduce Number of Biopsies
• Enhance Detection of Flat Neoplasia in BE and UC
• Emerging Clinical Utilization
Normal Mucosa
Dysplastic Mucosa
Risk Stratification Through Field Carcinogenesis Detection
• LEBS, PWS, ESS
• Targets Micro/Nano-Architectural Cell Changes
• Good Use of Finite Resource
Normal
Nanostructure
Optical Biopsy
• Chromoendoscopy, NBI, CLE, AFI
• Discriminates Adenoma From Non-Adenoma
• High Sensitivity, Low Specificity
Adenoma

# Morphology & Paris Class predict Sub Mucosal Invasion (SMI)

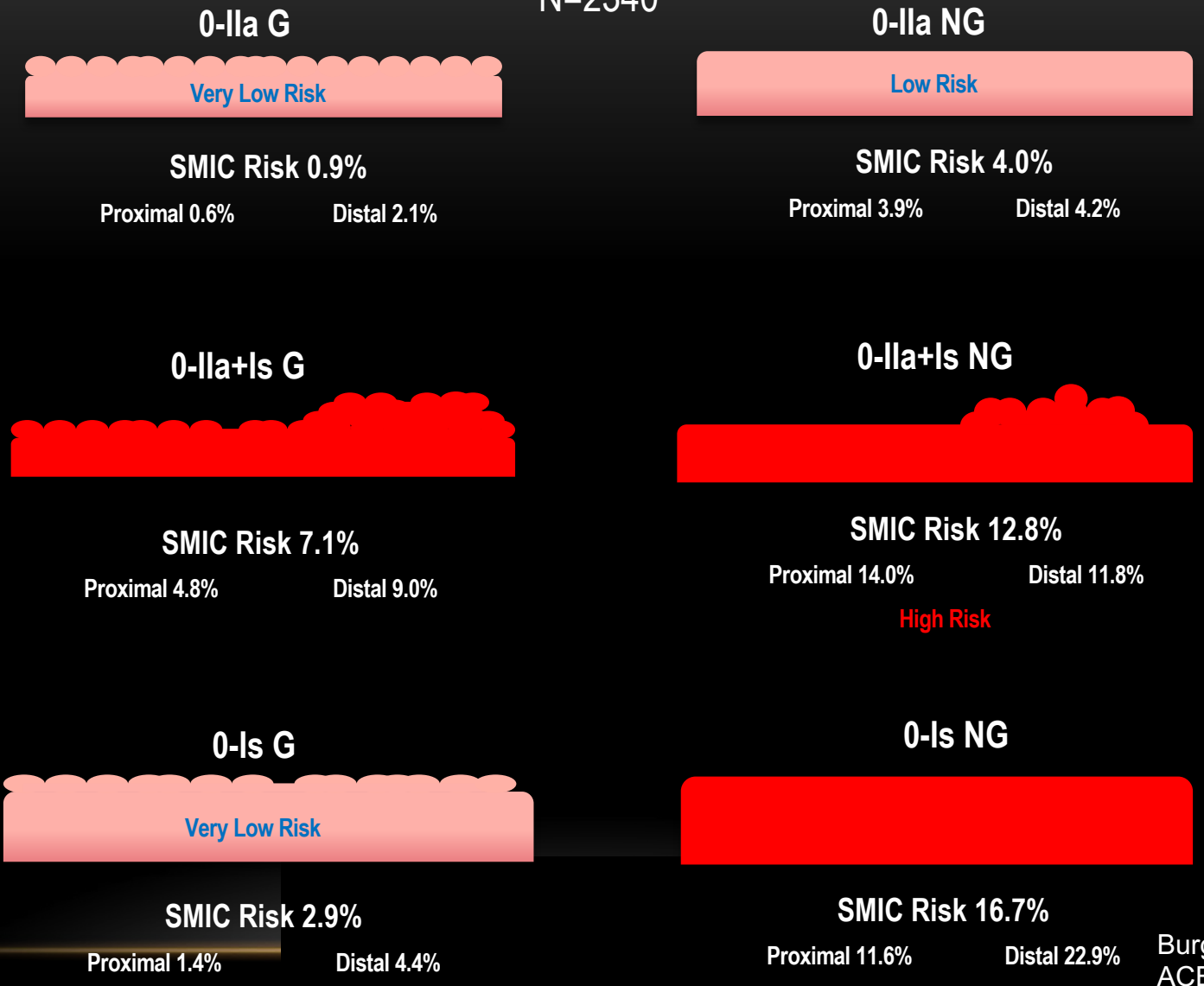
| Paris classification | n (SMI) | % |
|---|---|---|
| IIa | 4/132 | 3% |
| Is | 7/92 | 7% |
| Is + IIa | 5/40 | 13% |
| IIc or IIa +c | 6/13 | 46% |




Slide courtesy of Michael Bourke

# Risk of SMI according to Gross Morphology and Location

N=2340



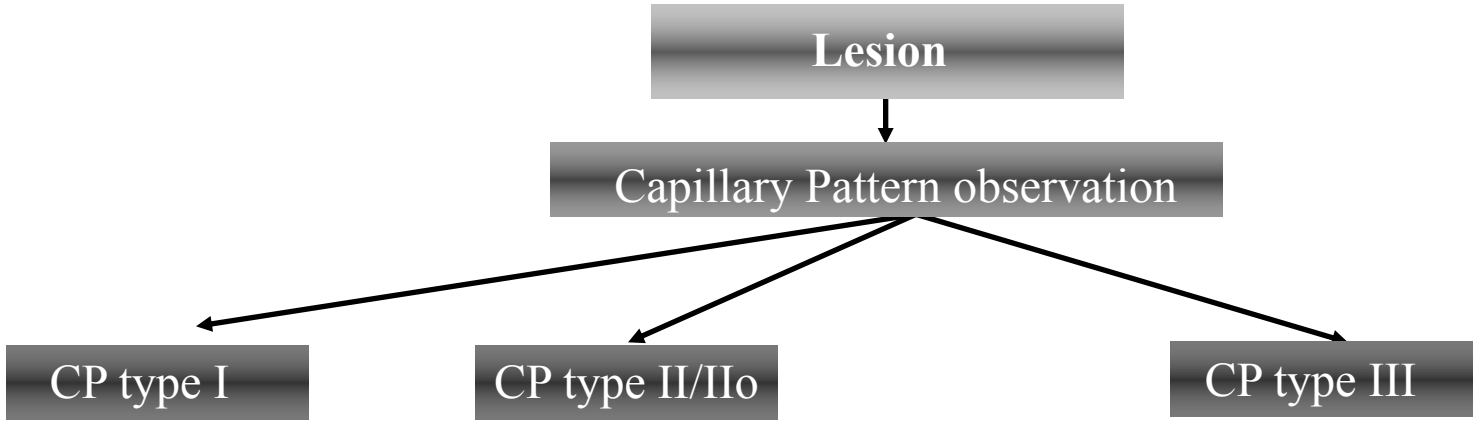

Burgess,..Singh, Bourke et al.
ACE group. Gastroenterology May 2017

# Characterisation

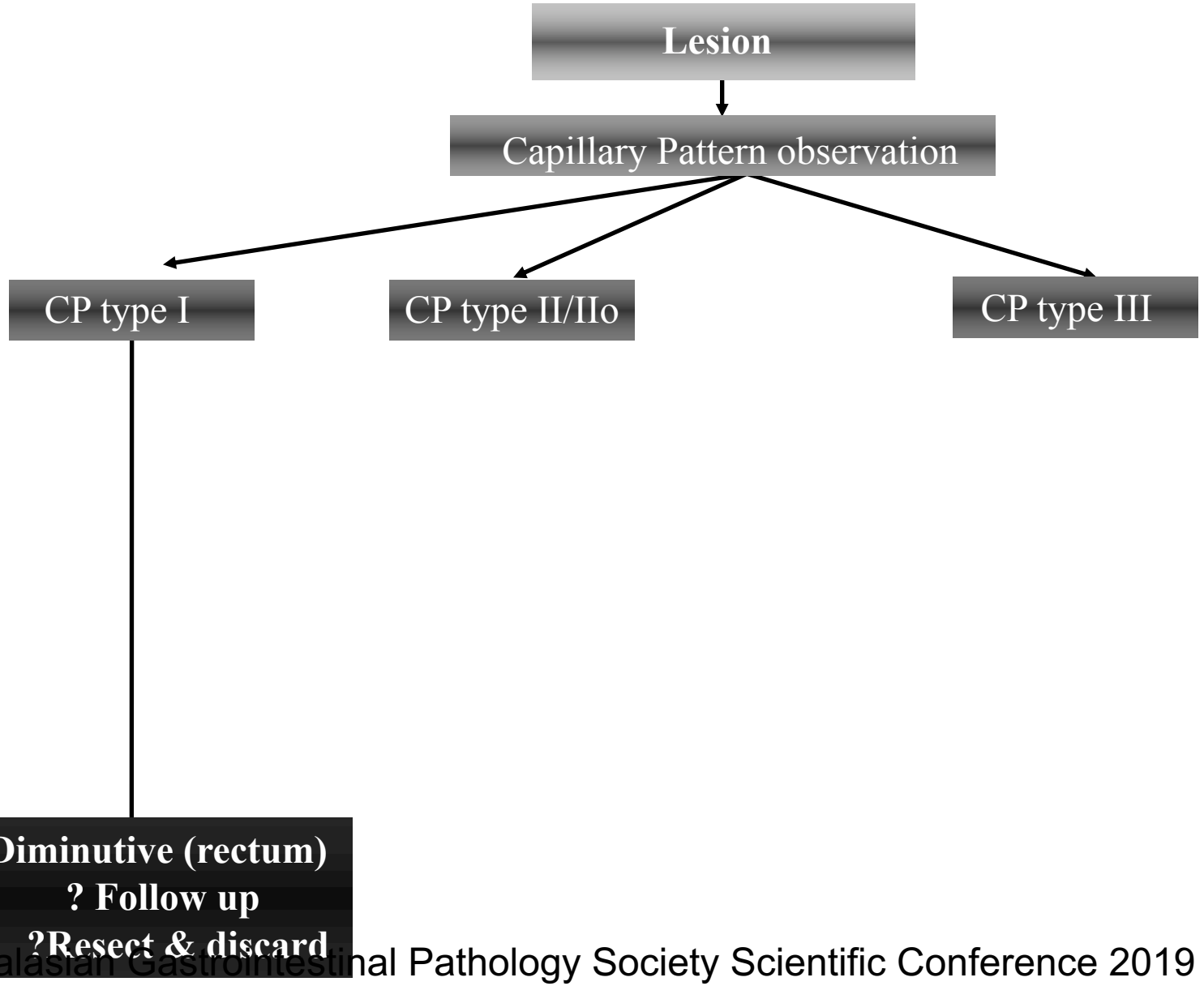
- Wide field view
  - Paris classification
  - Granularity

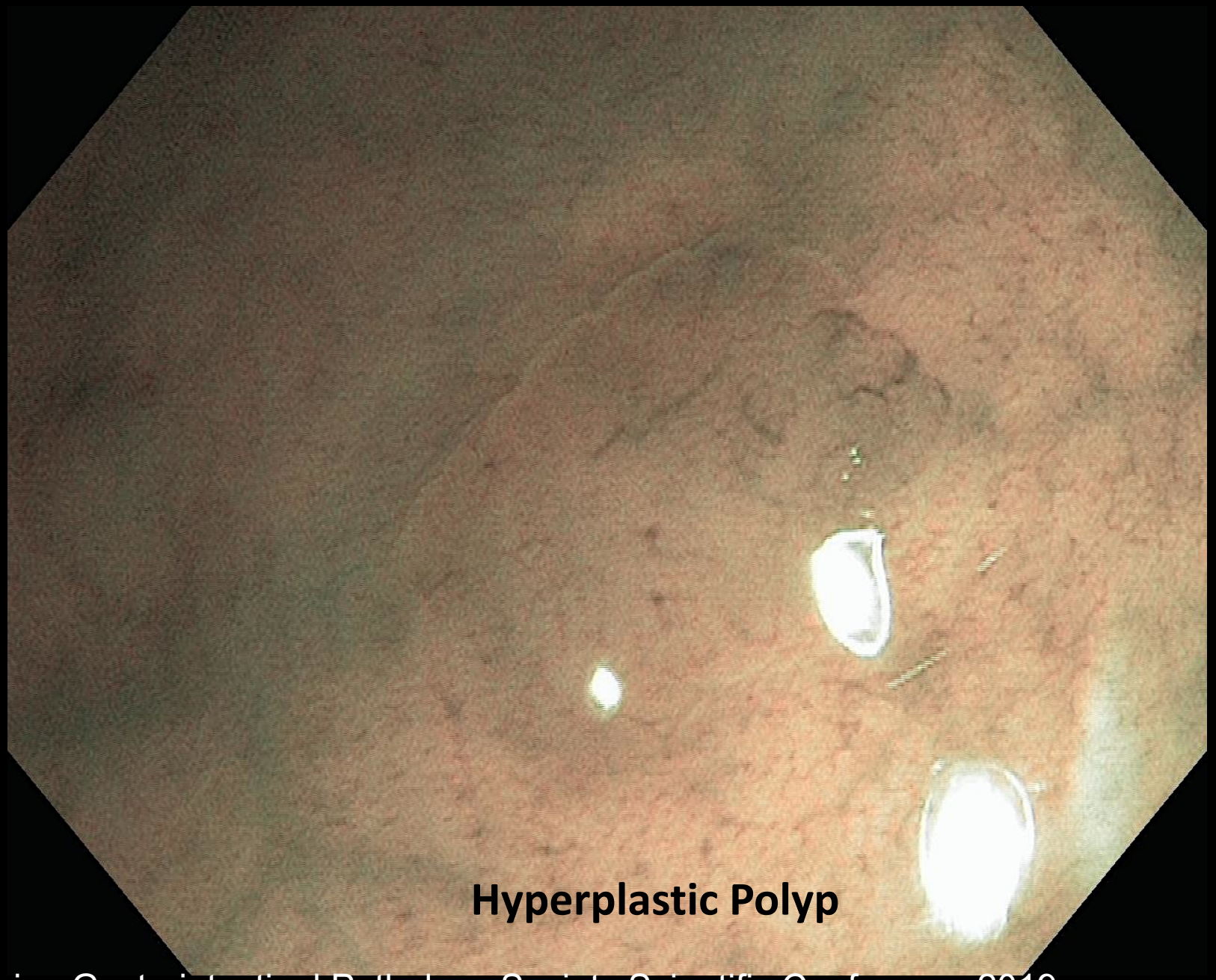
- Focal interrogation
  - Mesh brown capillary pattern (NBI/BLI/I scan)

# Strategy
# based on capillary patterns

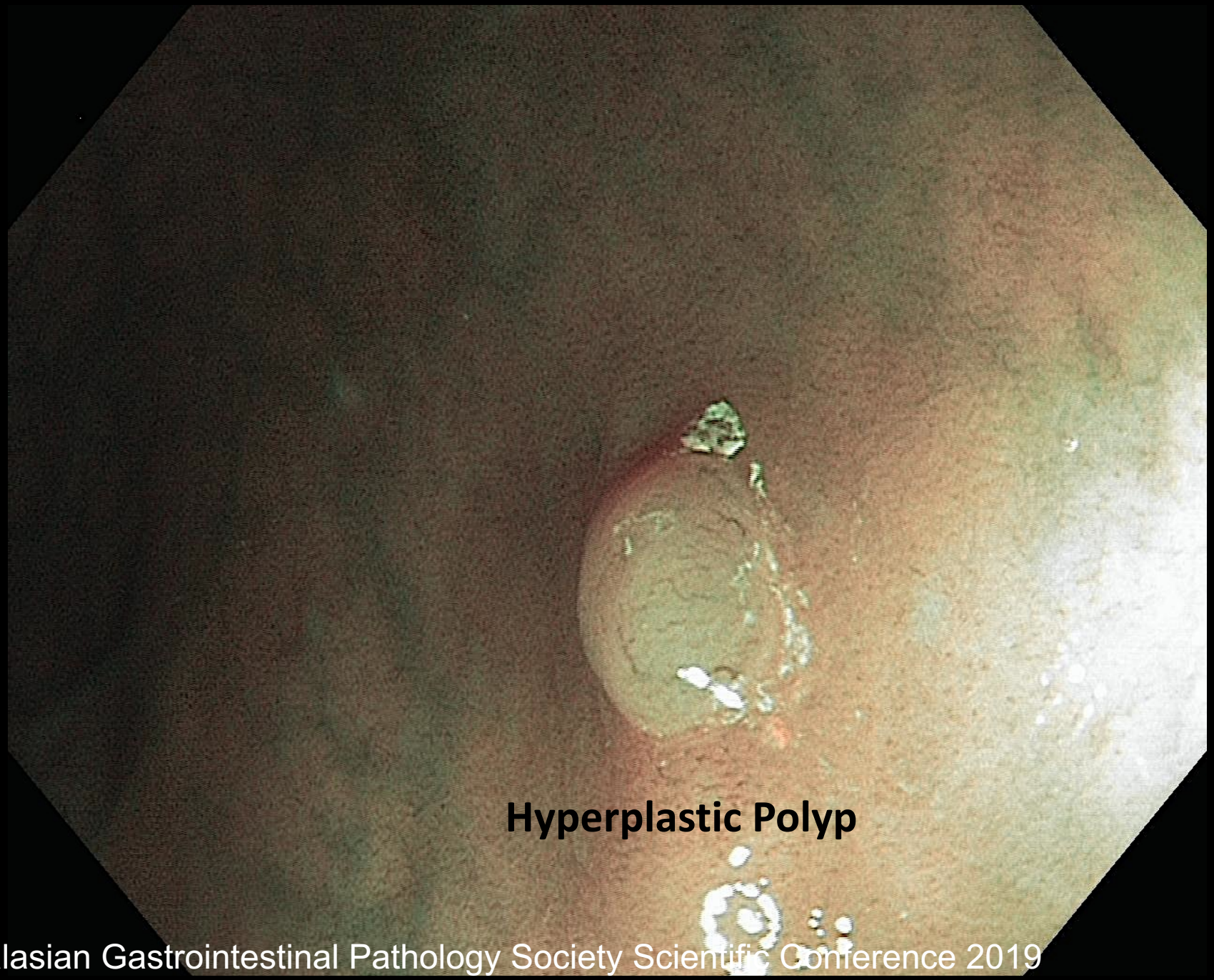


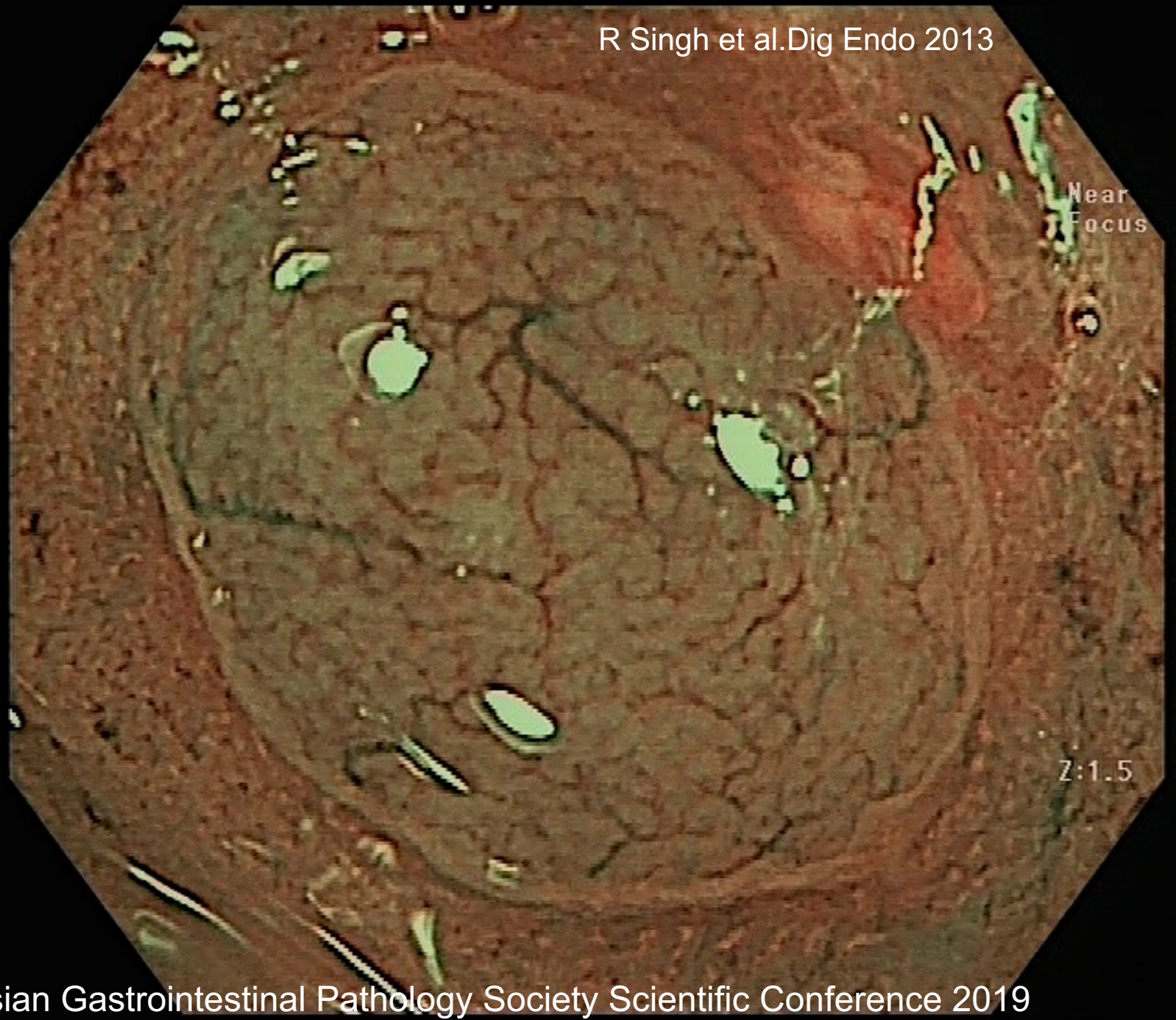
# Strategy
# based on capillary patterns





**Hyperplastic Polyp**


Hyperplastic Polyp

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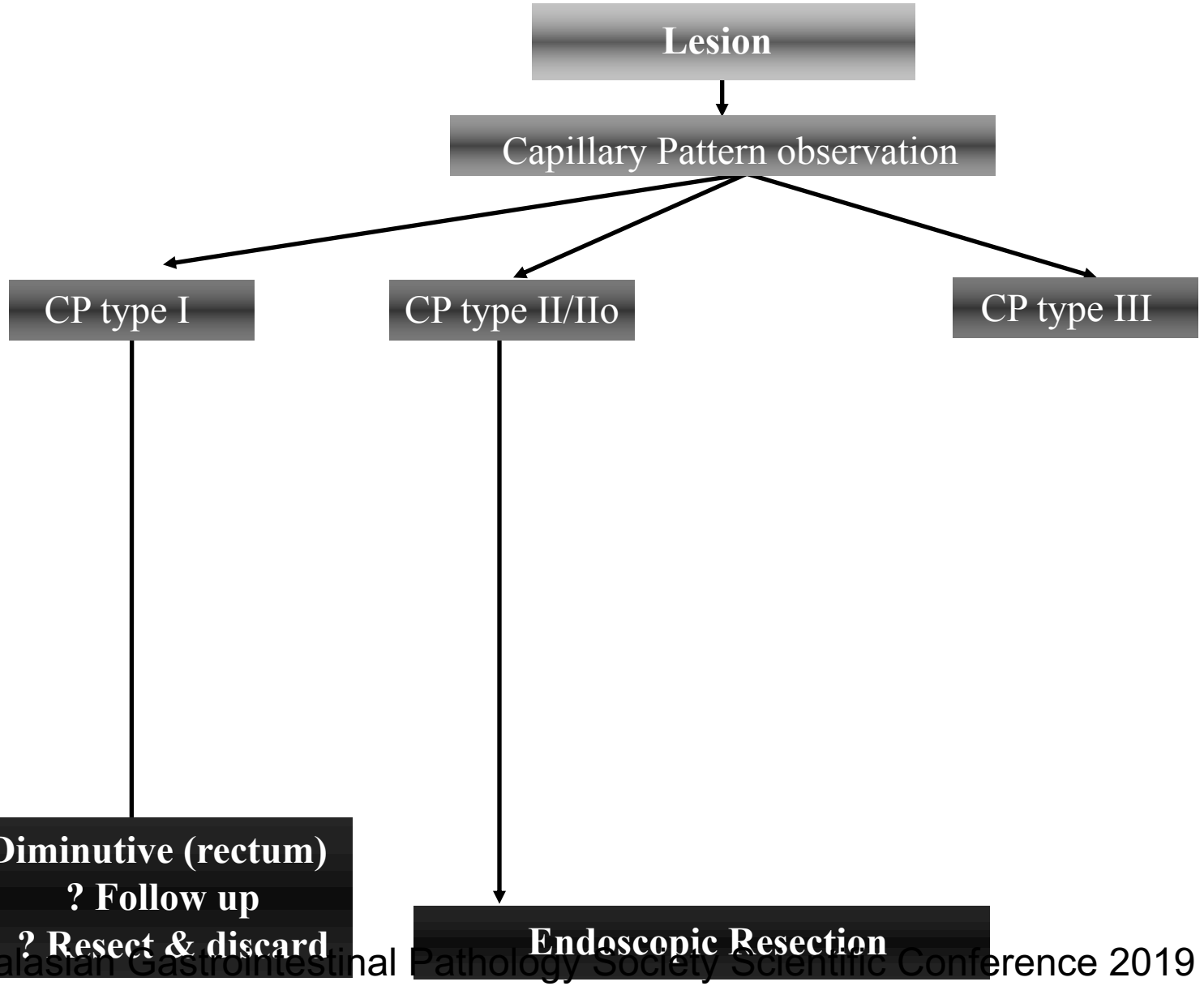
# Strategy
# based on capillary patterns




Adenoma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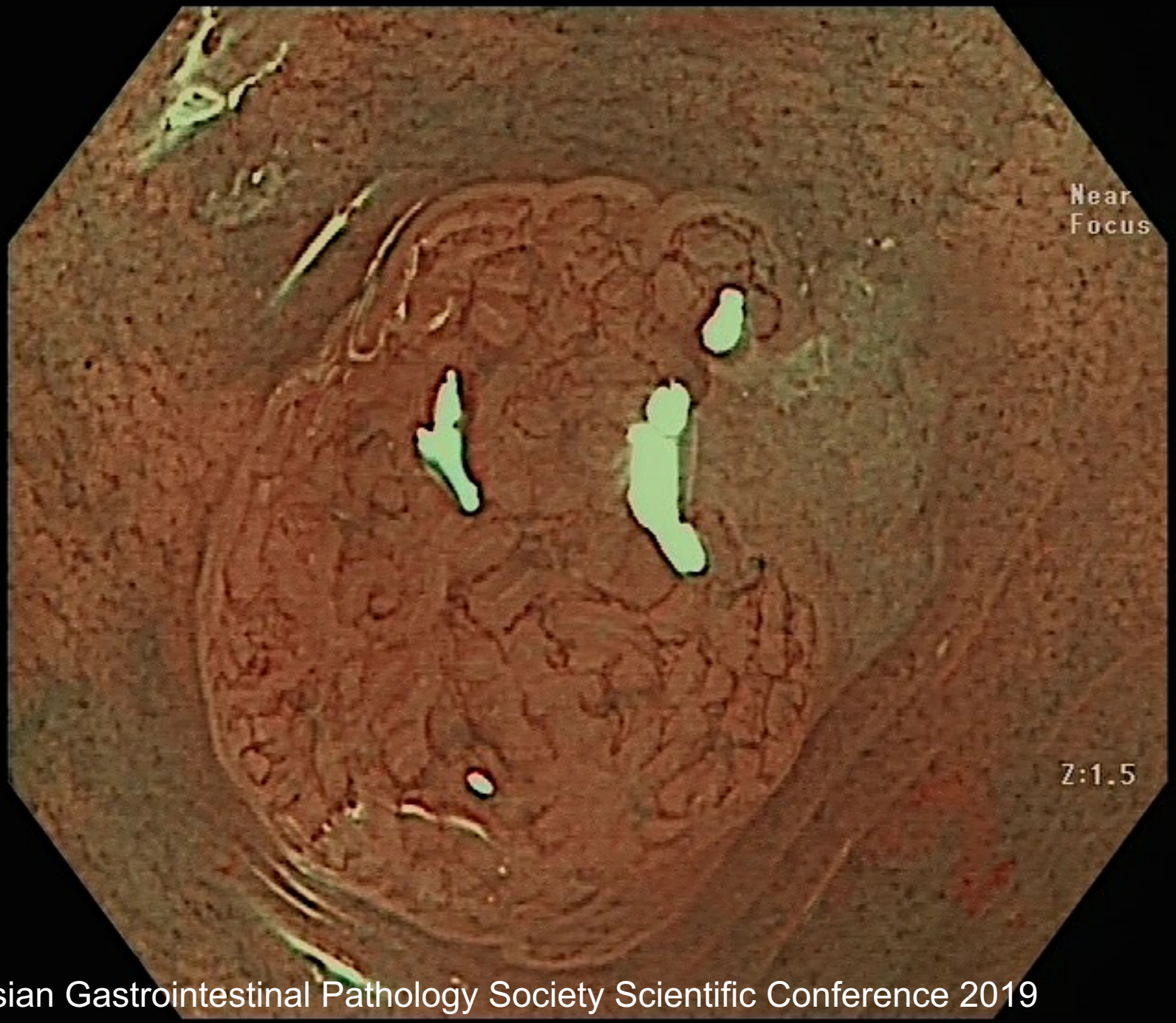
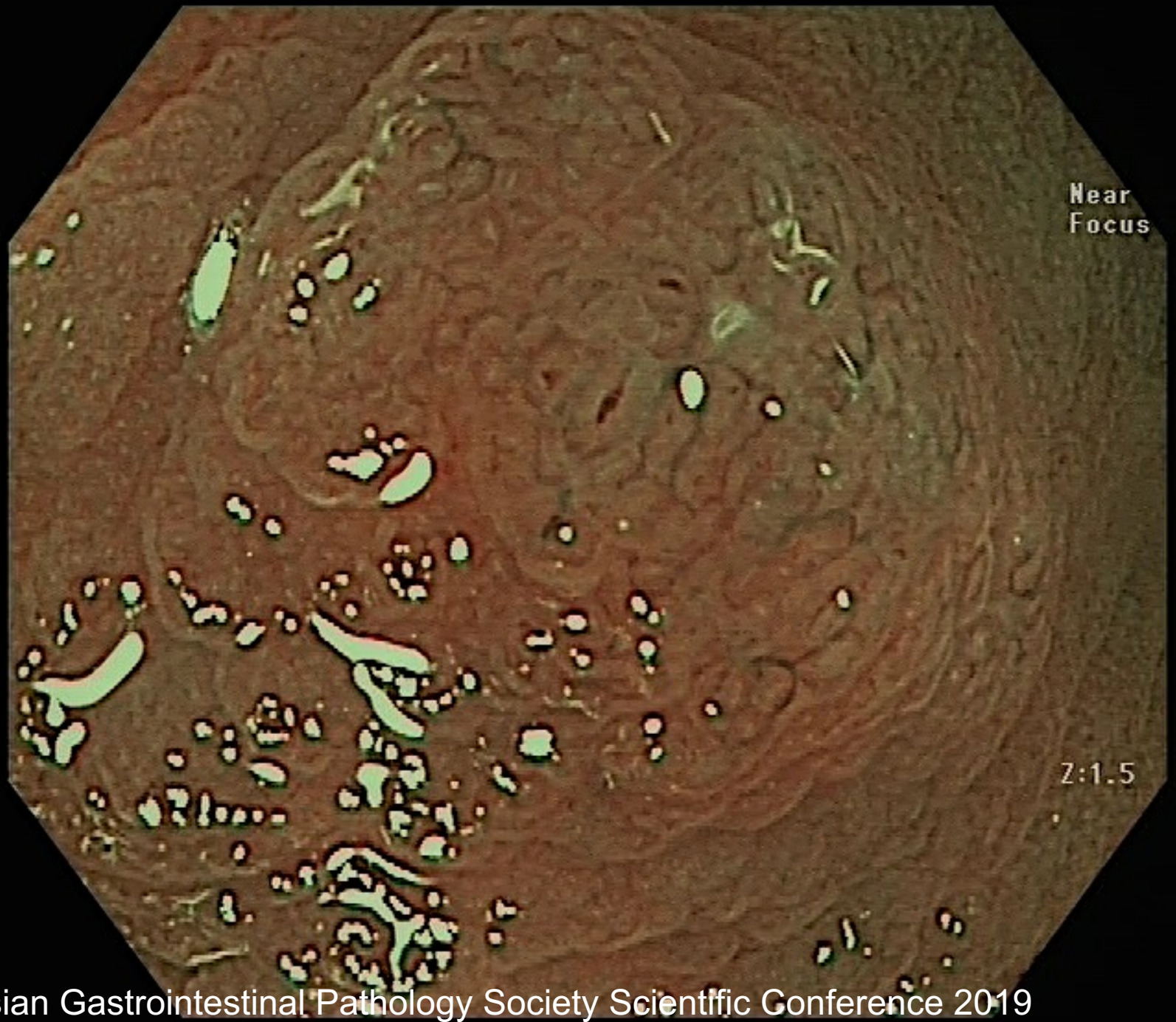

Near
Focus
Z:1.5

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# Type $II_o$

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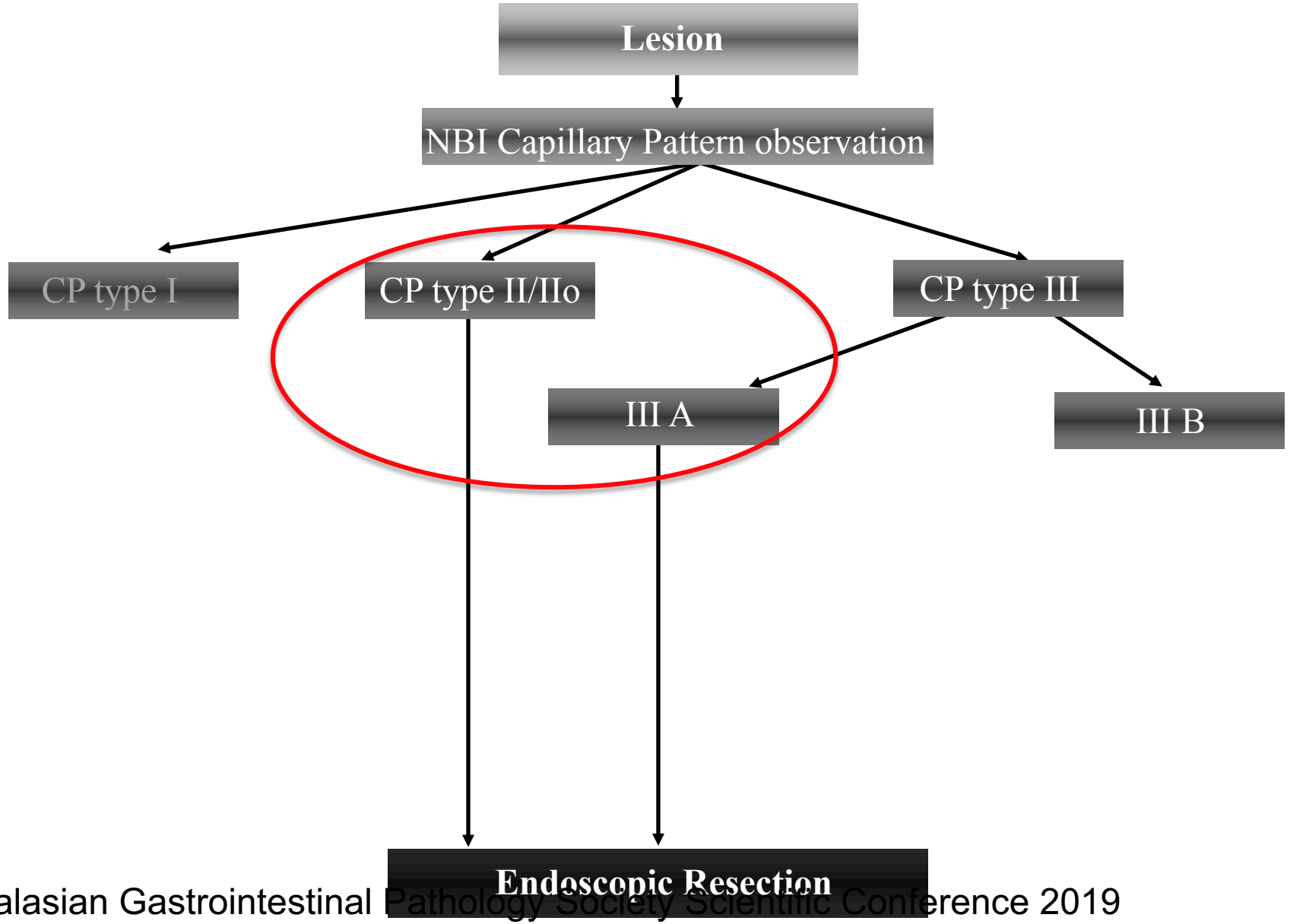
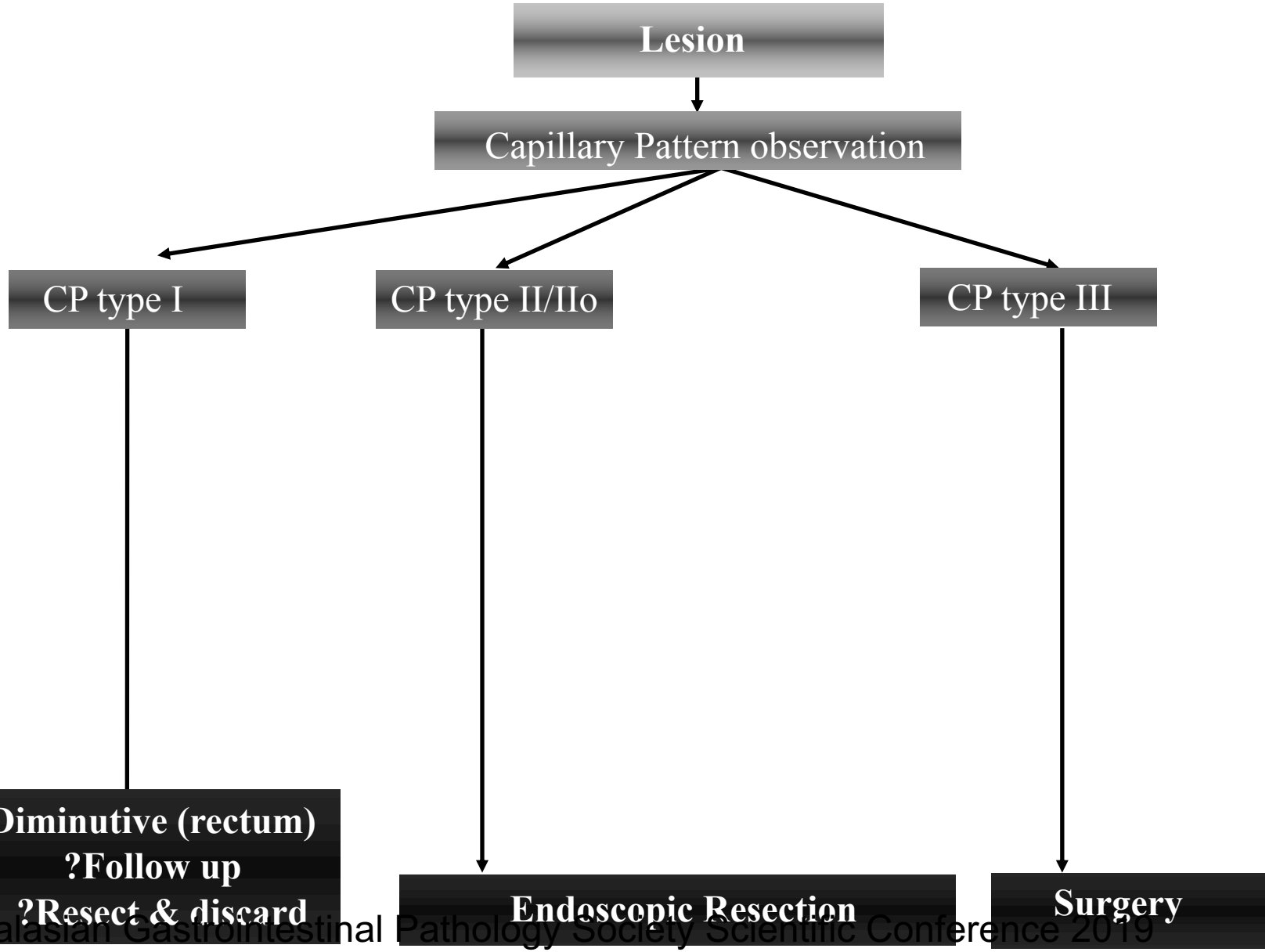
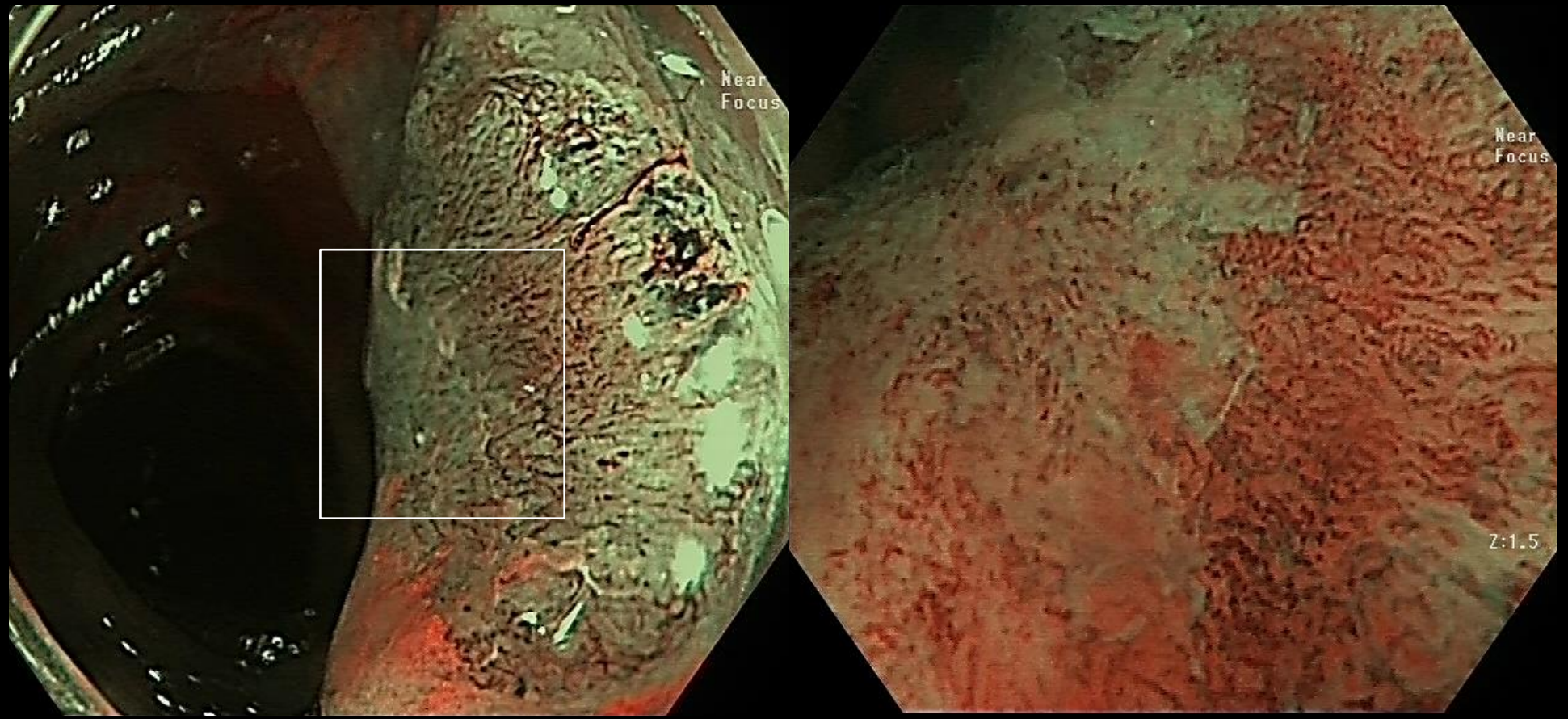
# Strategy
# based on capillary patterns



# Strategy
# based on capillary patterns






KL Cheong, L Zorrón Pu, R Singh (Malaysia, Brazil, Australia)

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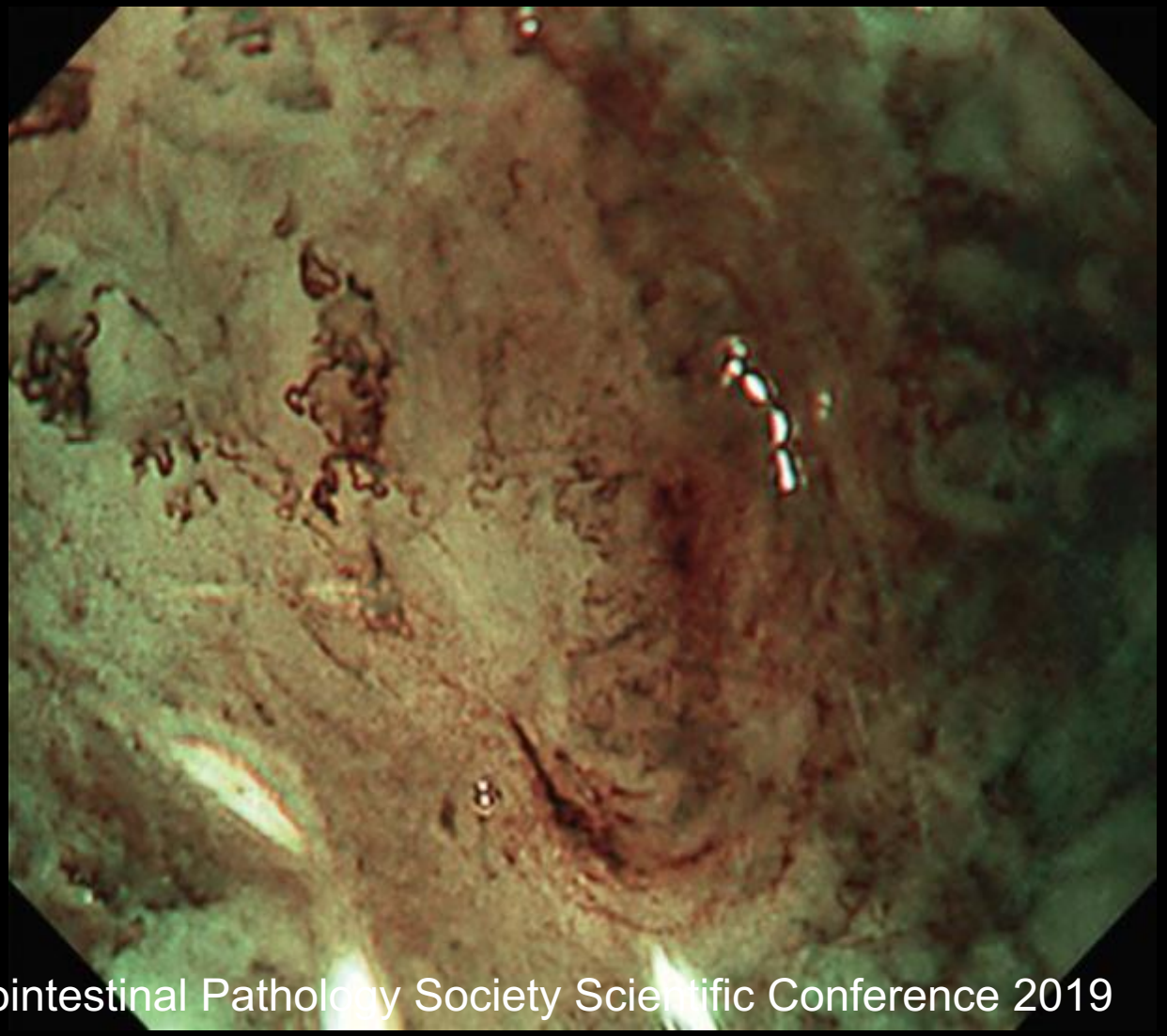
WEO
World Endoscopy
Organization

# Type $III_b$



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# Nuances

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2) Hot snare EMR
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# Classification of Deep Mural Injury (DMI)

- **Type 1 :** MP visible, but no mechanical injury. May have minimal thermal injury
- **Type 2 :** Focal or generalized loss of the submucosal plane raising concern for MP injury or rendering the MP defect un-interpretable
- **Type 3 :** MP injured, target or mirror target identified
- **Type 4 :** Actual hole within a white cautery ring, no observed contamination
- **Type 5 :** Actual hole within a white cautery ring, observed contamination

Bourke et al

# Nuances

1) Imaging: pre resection
2) Hot snare EMR
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# A MULTI-CENTRE RANDOMIZED CONTROL TRIAL OF SNARE TIP SOFT COAGULATION FOR THE PREVENTION OF ADENOMA RECURRENCE FOLLOWING COLONIC EMR

## RESULTS FROM THE "SCAR" STUDY

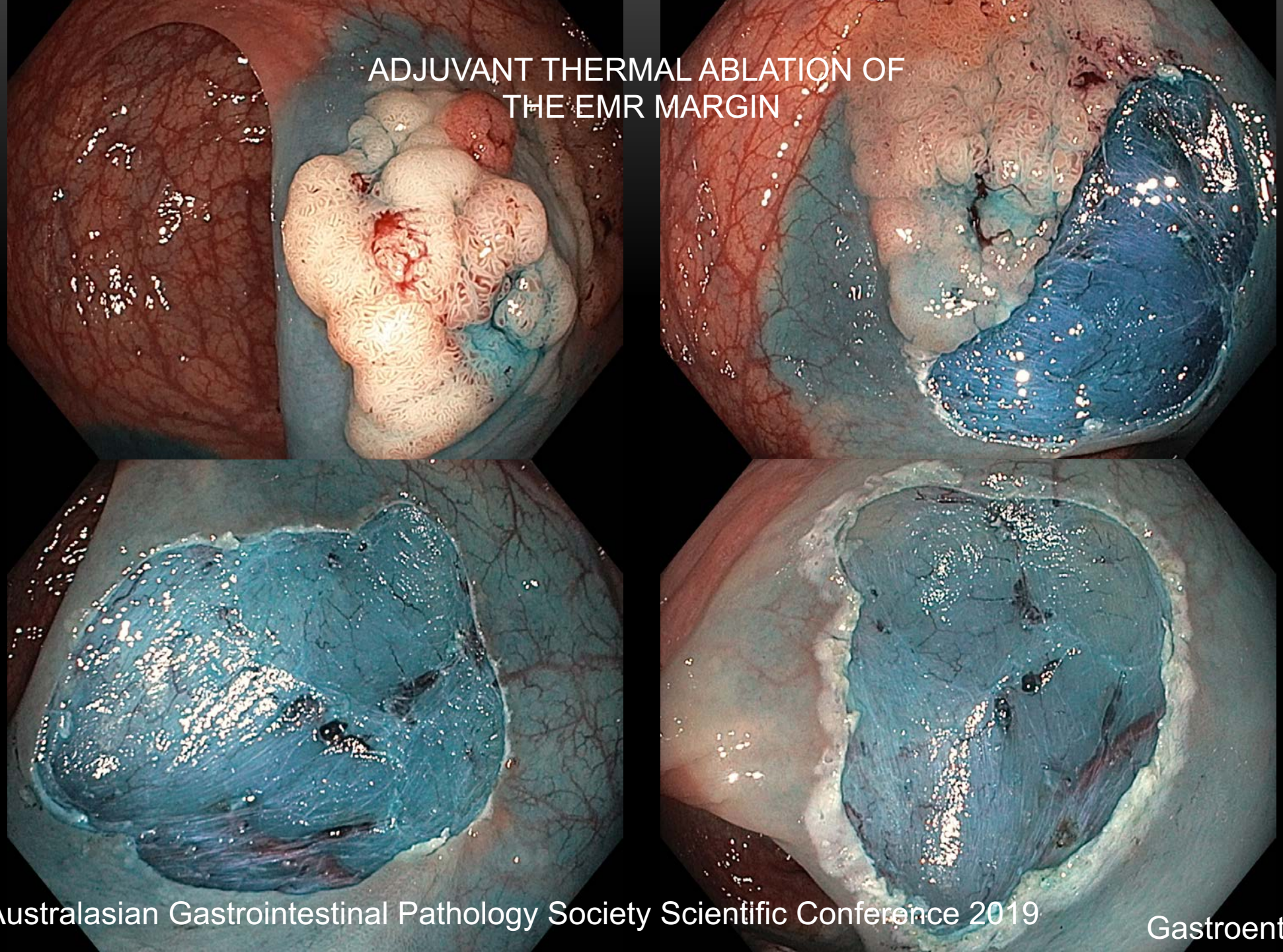
Amir Klein[1], Vanoo Jayasekeran[1], Luke Hourigan[3], Rajvinder Singh[5], Gregor Brown[4], David J Tate[1]
Farzan F Bahin[1,2], Nicholas Burgess[1,2], Stephen J Williams[1], Eric Lee[1], Michael J Bourke[1,2]

[1]Department of gastroenterology and hepatology, Westmead hospital Sydney; [2]University of Sydney; [3]Department of gastroenterology and hepatology Princess Alexsandra Hospital Brisbane; [4]Department of gastroenterology and hepatology Alfred Hospital Melbourne; [5]Department of gastroenterology and hepatology Lyell McEwin Hospital Adelaide

Gastroenterology 2018

Singh Australasian Gastrointestinal Pathology Society Scientific Conference 2019

# ADJUVANT THERMAL ABLATION OF THE EMR MARGIN



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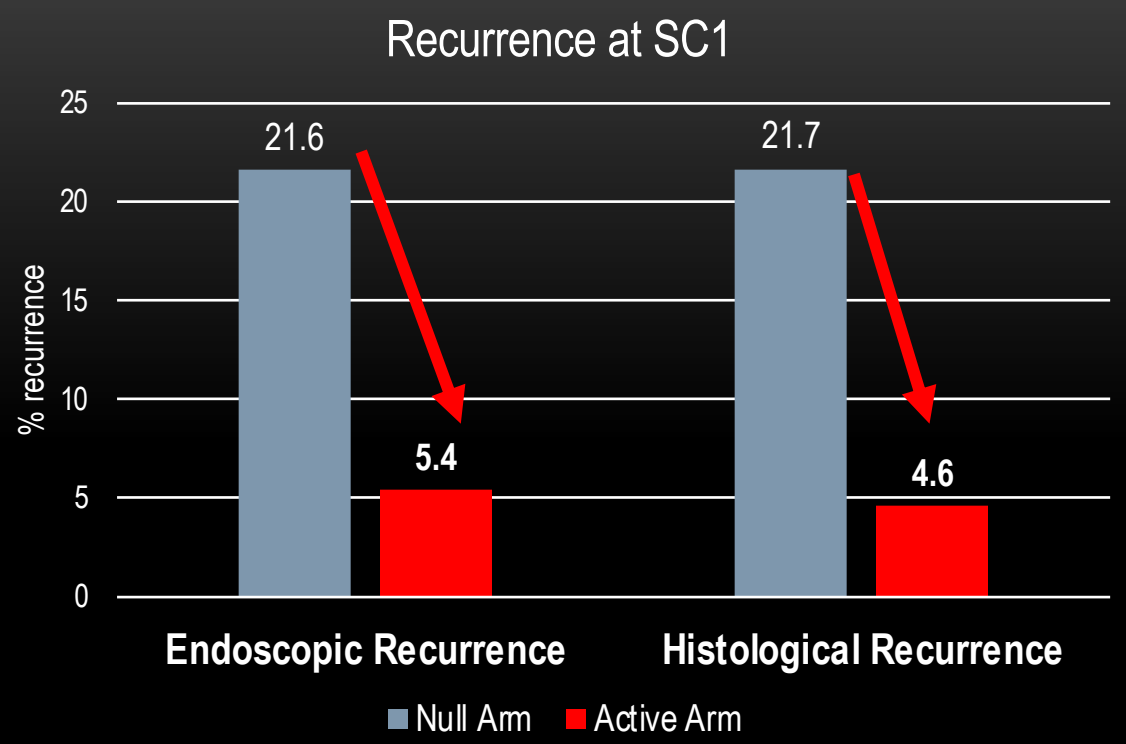
Gastroenterology 2018




| SC1 | Null arm | Active arm | RR | NNT | p |
|---|---|---|---|---|---|
| Endoscopic recurrence | 21.6% (33/153) | 5.4% (9/167) | 0.25 | 6.17 | < 0.001 |
| Histological recurrence | 21.7% (26/120) | 4.6% (6/131) | 0.21 | 5.89 | < 0.001 |

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Gastroenterology 2018

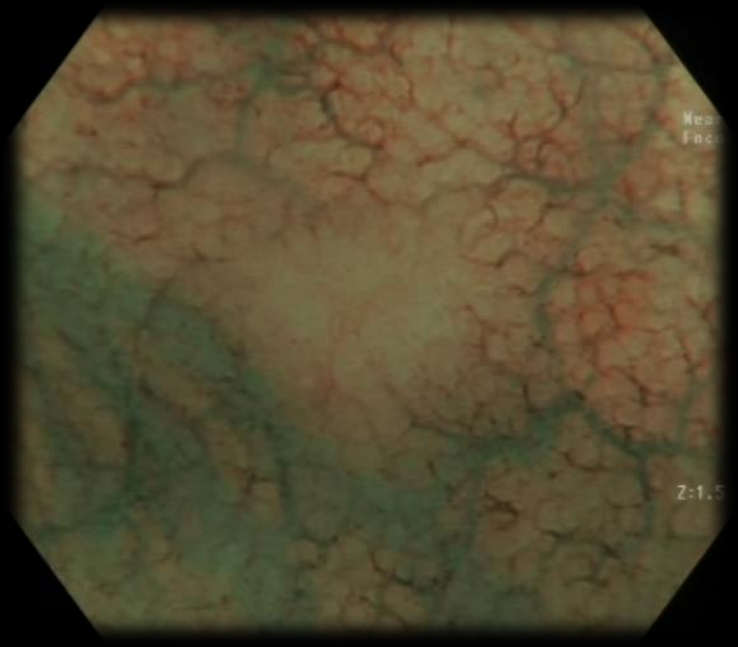
# Nuances

1) Imaging: pre resection
2) Hot snare EMR
3) Cold snare EMR
4) Evaluate base : post resection
5) Preventing recurrence
6) Seeing recurrence on follow up

# NBI-SCAR classification

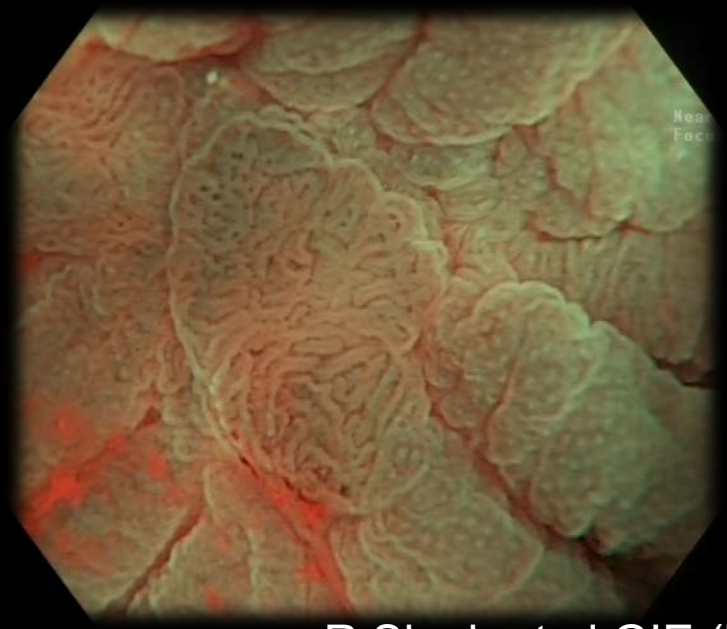
**NO RECURRENCE**

1. Whitish/pale appearance
2. Round with/without slightly larger pits
3. Irregular sparse vessels with no change in calibre

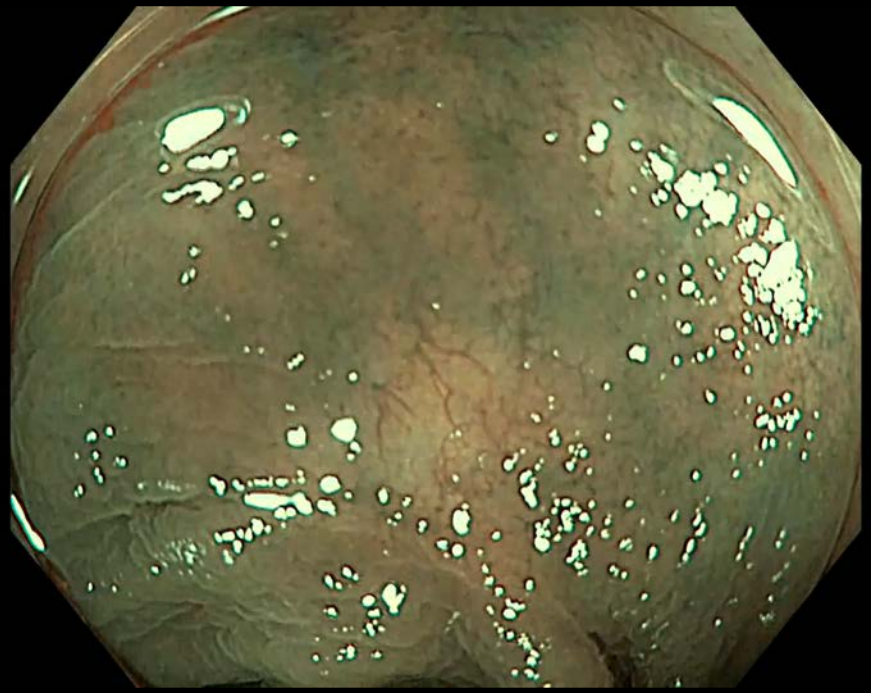


**RECURRENCE**

1. Dark/Brown colour
2. Elongated or branched pit pattern
3. Dense capillary pattern surrounding pits



R Singh et al GIE (in press)



R Singh et al GIE (in press)

# Results: Exploratory phase

| | Arm | Accuracy (95% CI) | Sensitivity* (95% CI) | NPV (95% CI) |
|---|---|---|---|---|
| **Overall** | NBI-SCAR | 95.0% (88.8;97.9) | 100% (96.3;100) | 100% (96.3;100) |
| | HDWLE | 93.0% (86.3;96.6) | 73.7% (64.3;81.3) | 94.1% (87.7;97.3) |
| **High confidence diagnoses** | NBI-SCAR | 100% (96.1;100) | 100% (96.1;100) | 100% (96.1;100) |
| | HDWLE | 94.7% (88.3;97.7) | 73.7% (64.0;81.5) | 93.8% (87.1;97.2) |

R Singh Australasian Gastrointestinal Pathology Society Scientific Conference 2019

R Singh et al GIE (in press)

# Results: Validation

| Country (n) | Accuracy - % (95% CI) | Sensitivity - % (95% CI) | NPV - % (95% CI) |
|---|---|---|---|
| USA (4) | **88.5%** (79.7;93.8) | **100%** (95.4;100) | **100%** (95.4;100) |
| JAPAN (12) | **95.6%** (92.2;97.6) | **91.7%** (87.5;94.6) | **99.0%** (96.8;99.7) |
| BRAZIL (5) | **80.4%** (71.6;87.0) | **100%** (96.3;100) | **100%** (96.3;100) |
| SINGAPORE (5) | **92.7%** (85.9;96.4) | **100%** (96.3;100) | **100%** (96.3;100) |
| AUSTRALIA (2) | **95.0%** (83.5;98.6) | **100%** (91.2;100) | **100%** (91.2;100) |

R Singh et al GIE (in press)

**Inter-rater reliability : substantial** (0.61)

# Potential implications

1. Don’t biopsy scar with with no features of adenoma (high confidence)

2. Treat scar with features suggestive of adenoma (high confidence)

3. Low confidence: Treat? Biopsy?

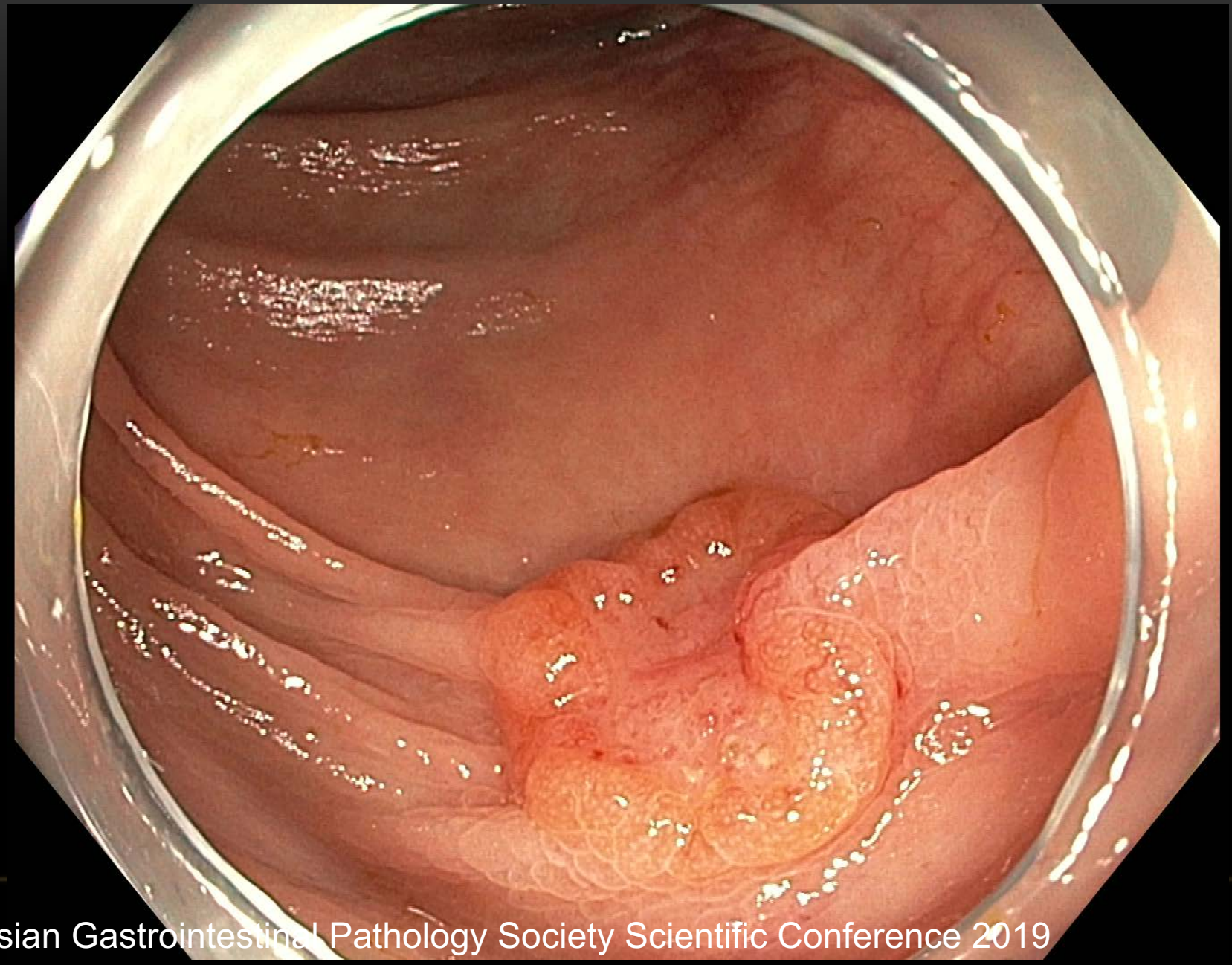
# Colon

- EMR- Nuances
- FTR
- ESD

# FTR: Indication

Lesions <2cm

- Recalcitrant- scarred, previous attempts
- Suspected of harboring superficial submucosal cancer
- Consider lesions with deeper submucosal invasion? Poor surgical candidates



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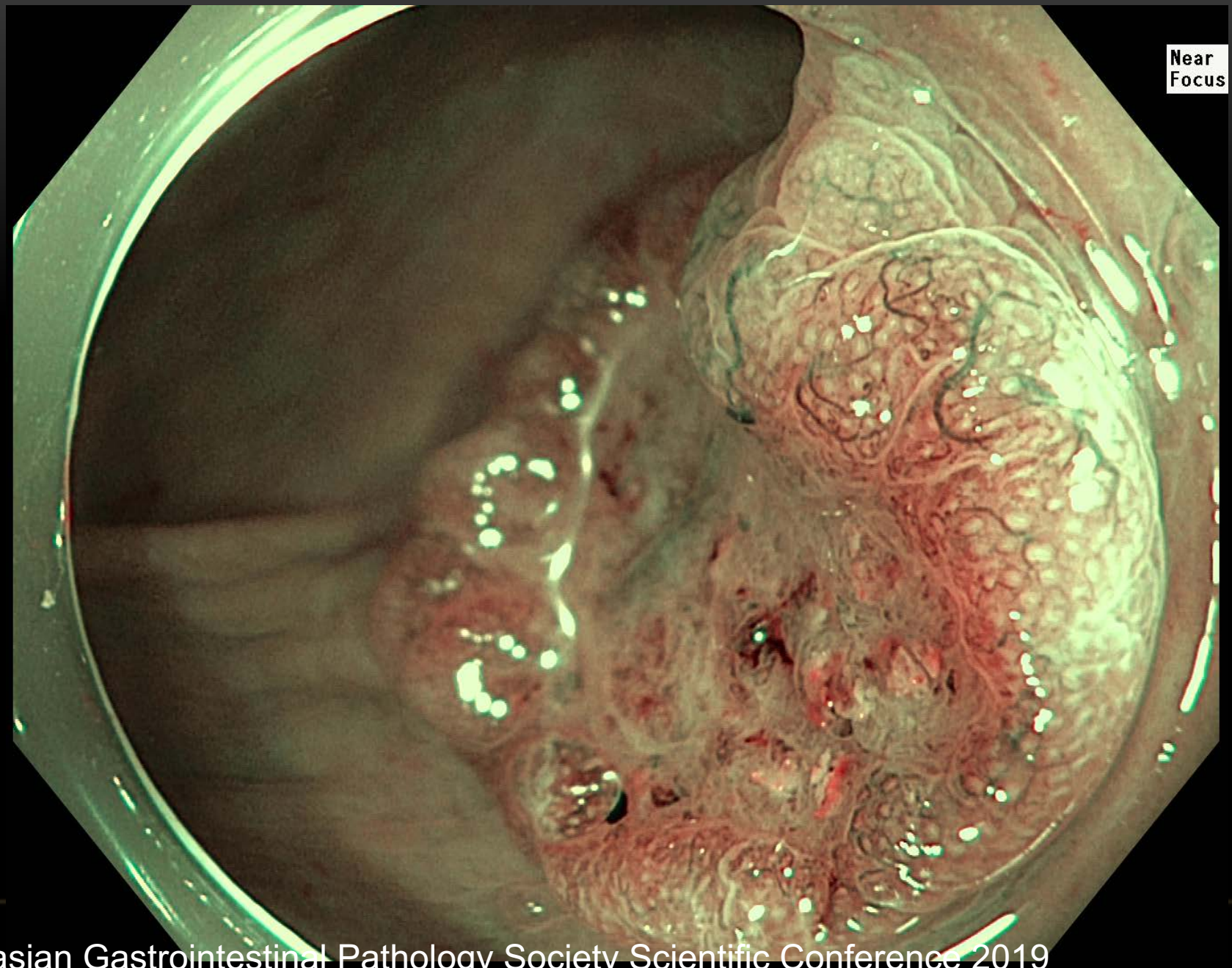


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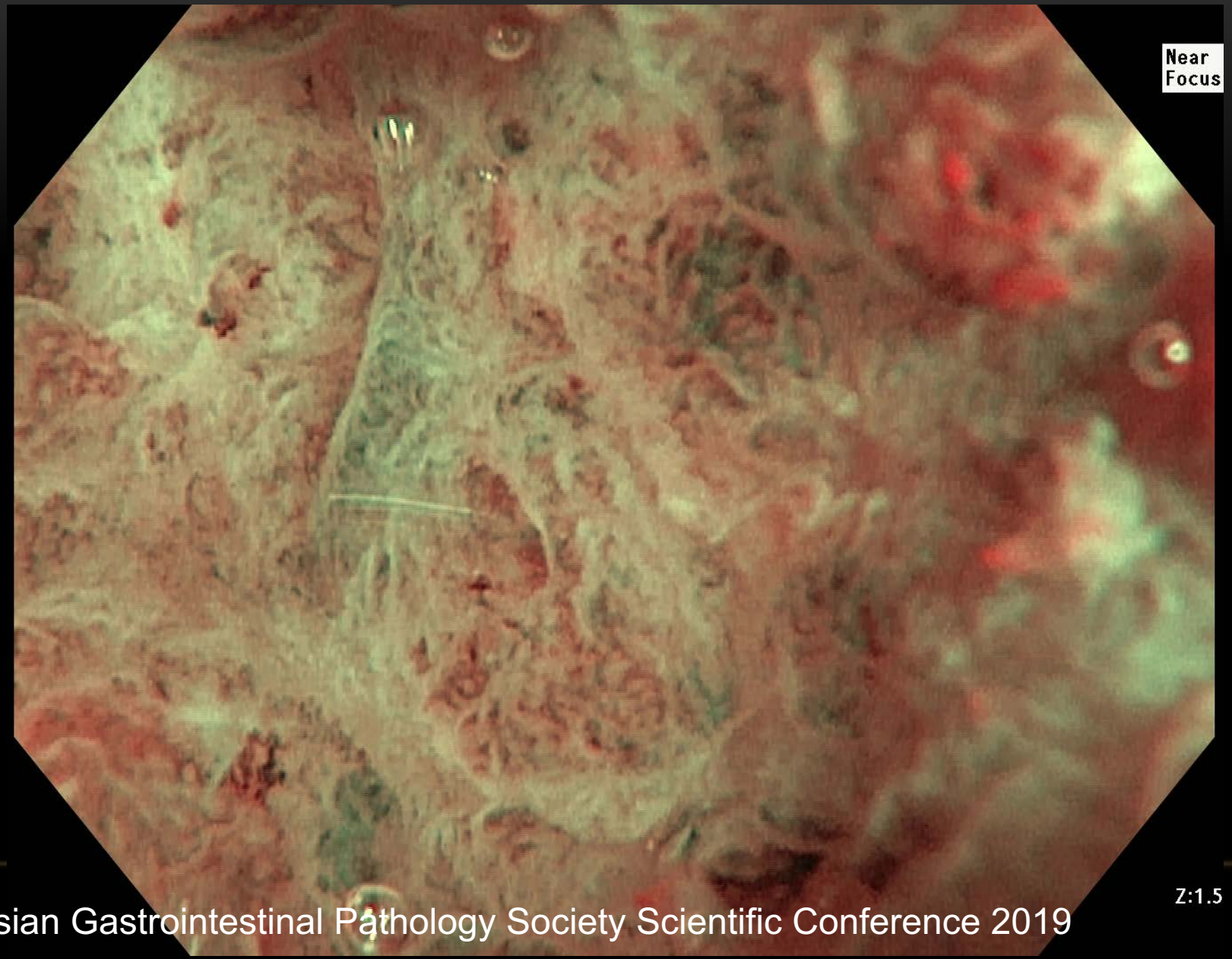


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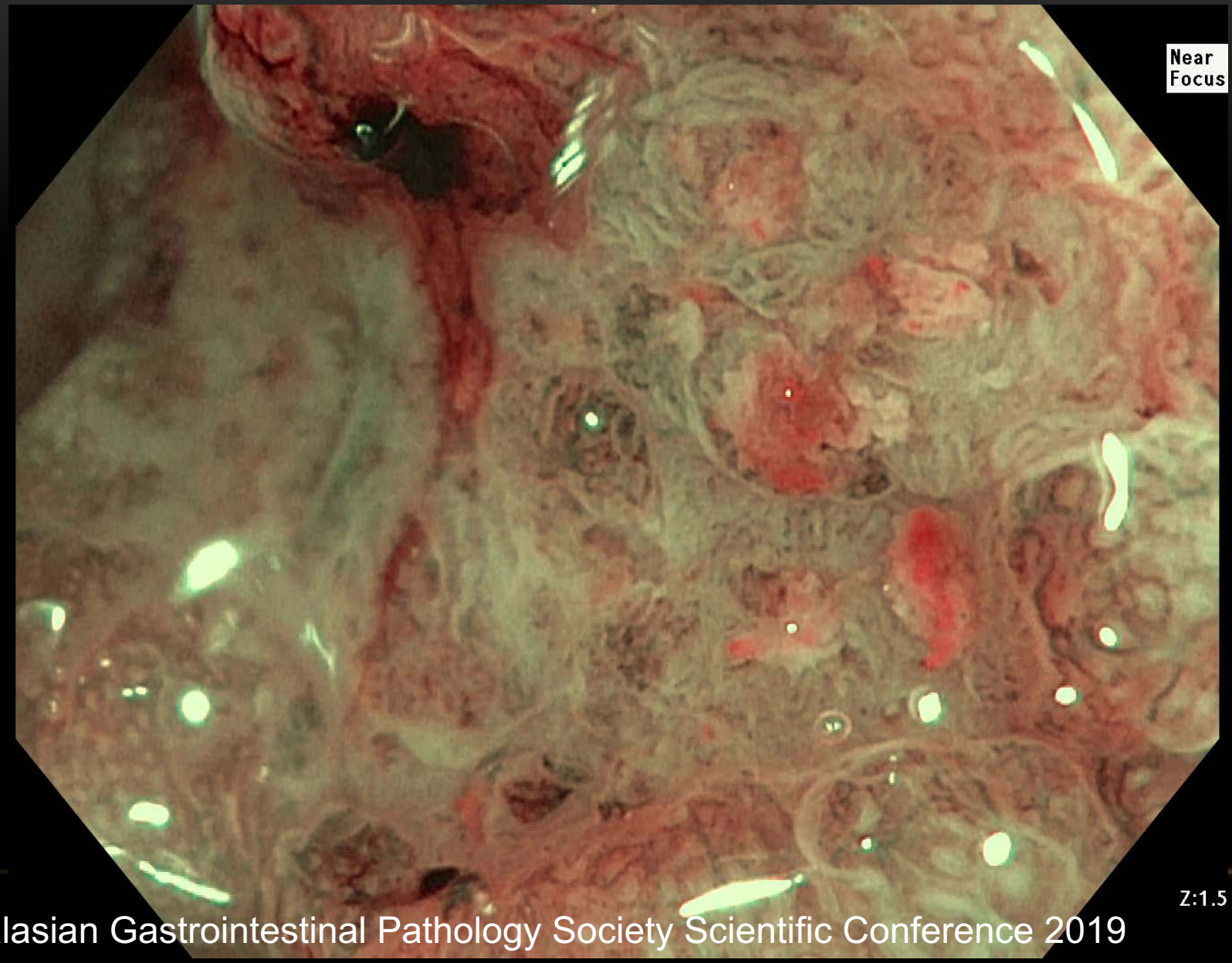


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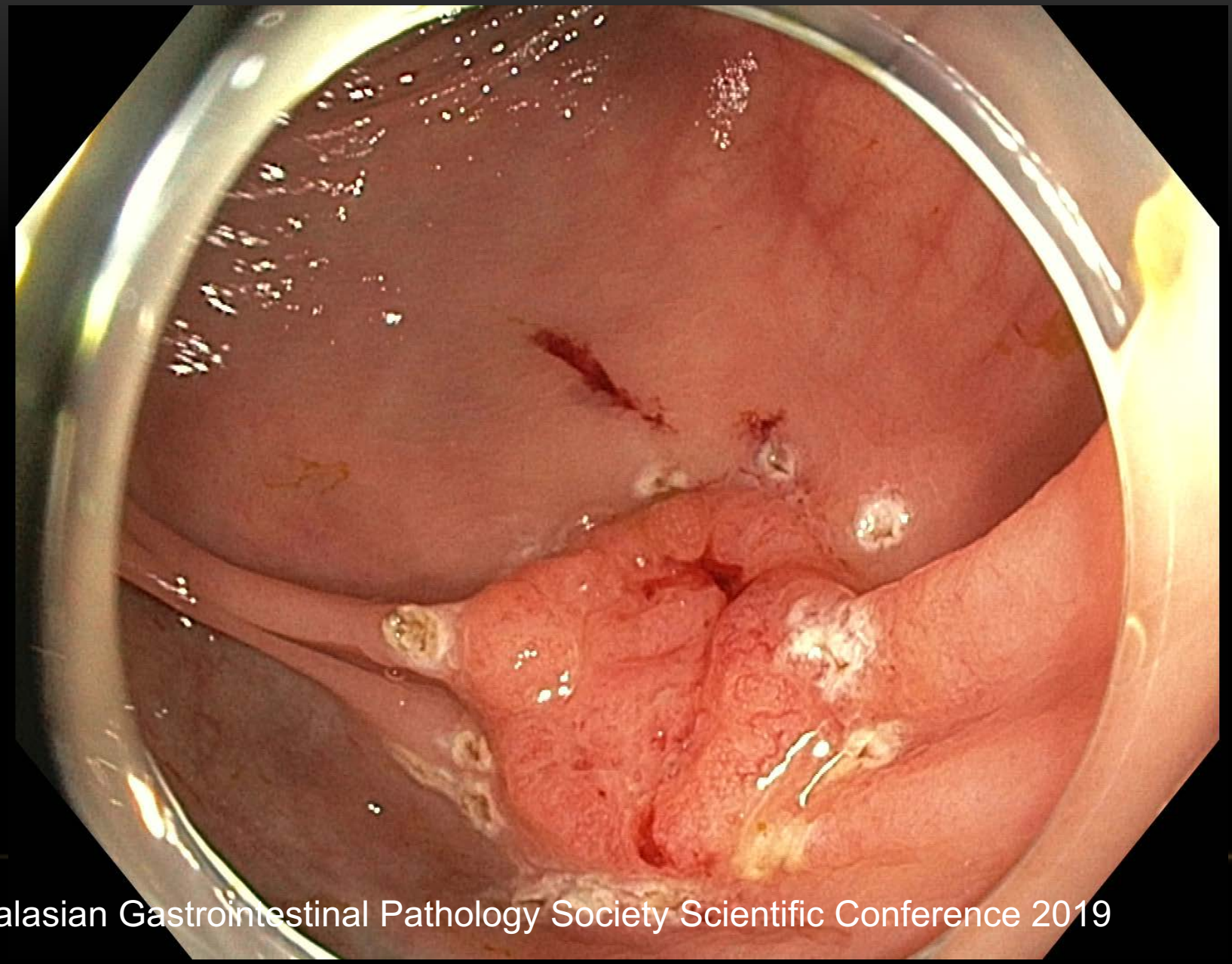

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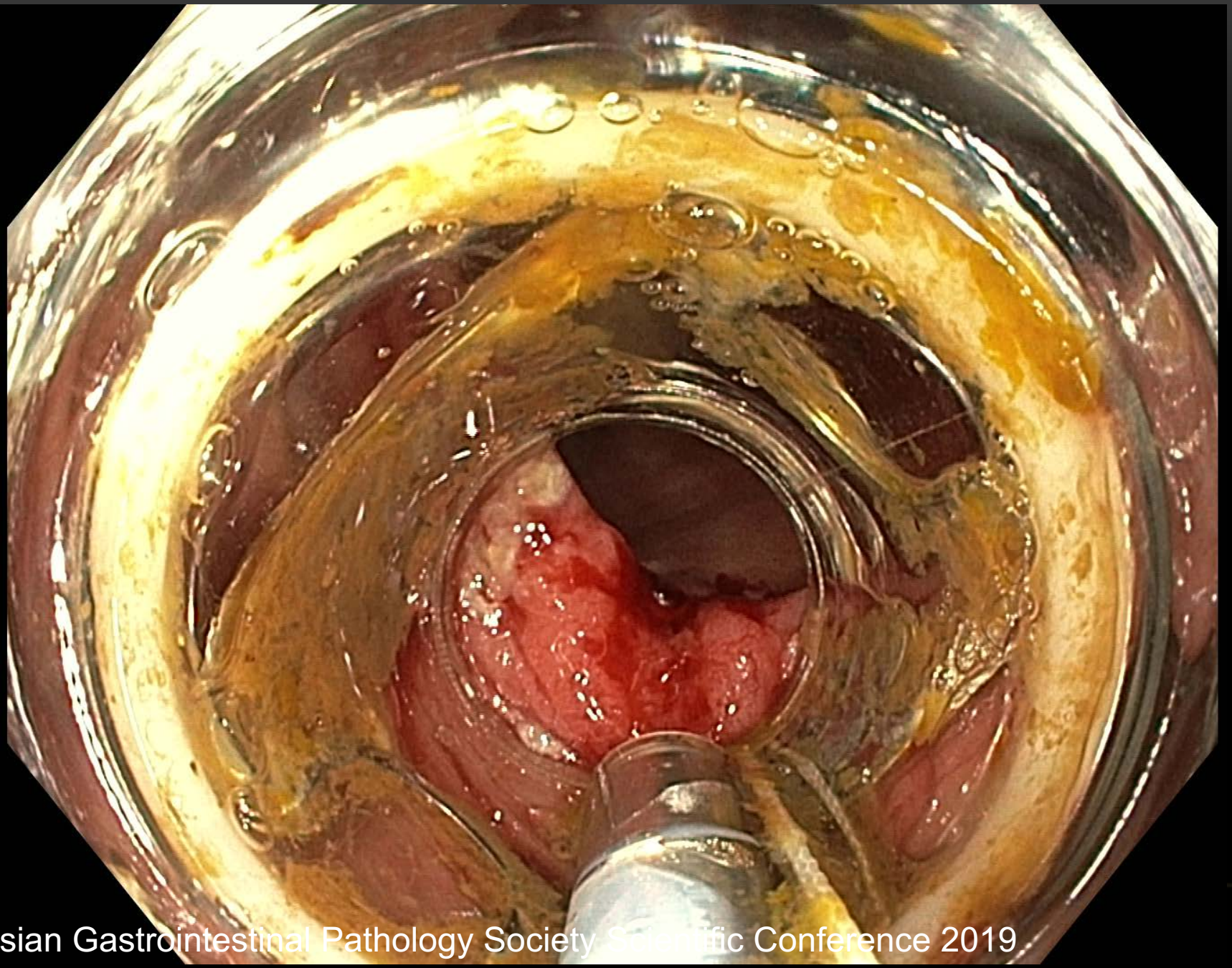

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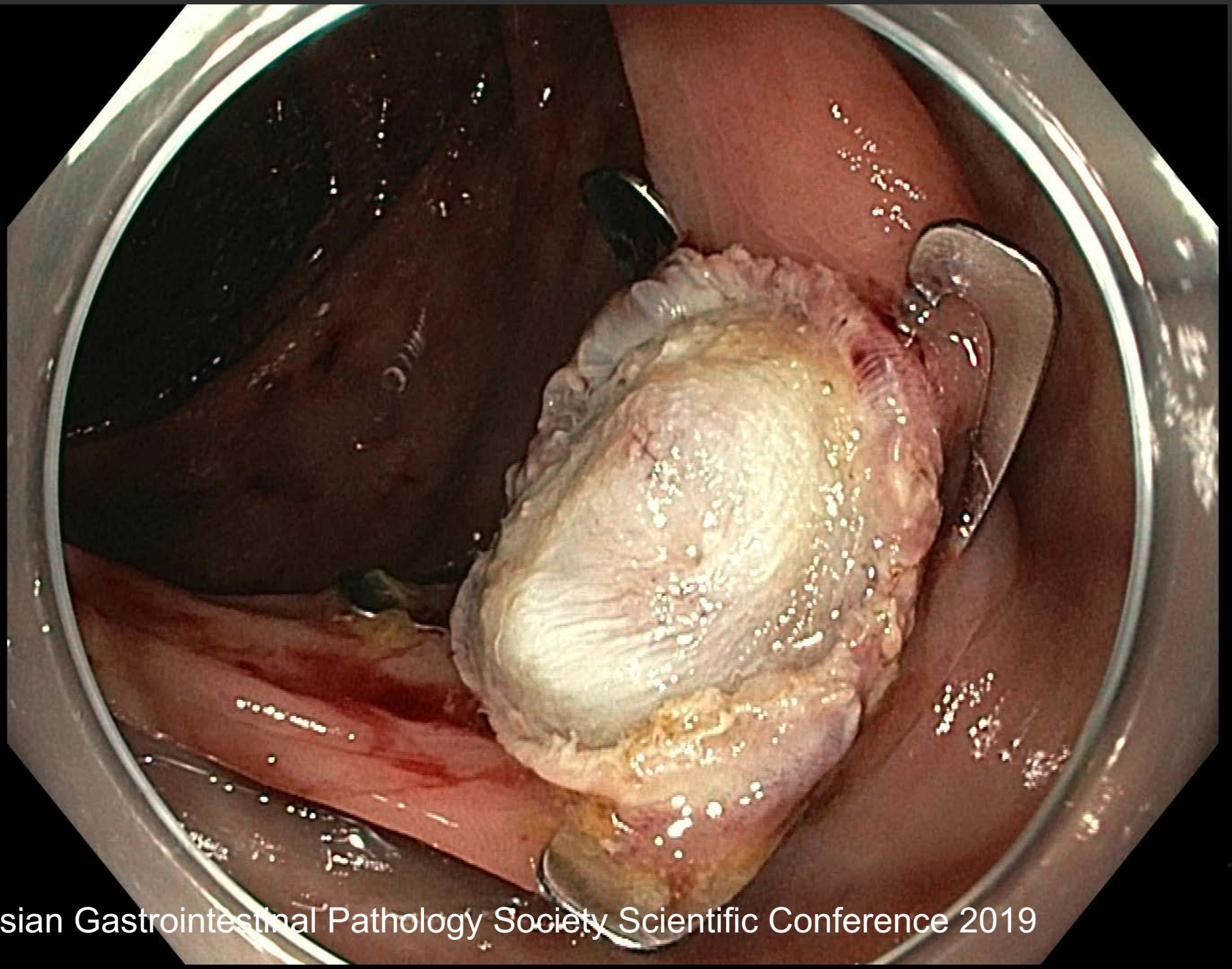

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# Colon

- EMR- Nuances
- FTR
- ESD

# META-ANALYSIS
# COLORECTAL ESD VS. EMR

- En bloc resection in ESD was 92% compared to EMR (47%)
- The rate of recurrence was much lower in ESD than in EMR

  (1% vs 12%)
- The rate of perforation with ESD (5.7%) was significantly higher than that associated with EMR (1.4%)
- Additional surgery: ESD 9%  EMR 6%

Fujiya et al. GIE 2015

# ESD IN THE COLON

- When

- How

# How

- Pre ESD: Lesion assessment and indication
- ESD: equipment & technique
- Complications
- Training

# How

- Pre ESD: Lesion assessment and indication
- ESD: equipment & technique
- Complications
- Training

Guideline

# Endoscopic submucosal dissection: European Society of Gastrointestinal Endoscopy (ESGE) Guideline

**Authors**

Pedro Pimentel-Nunes[1], Mário Dinis-Ribeiro[1], Thierry Ponchon[2], Alessandro Repici[3], Michael Vieth[4], Antonella De Ceglie[5], Arnaldo Amato[6], Frieder Berr[7], Pradeep Bhandari[8], Andrzej Bialek[9], Massimo Conio[10], Jelle Haringsma[11], Cord Langner[12], Søren Meisner[13], Helmut Messmann[14], Mario Morino[15], Horst Neuhaus[16], Hubert Piessevaux[17], Massimo Rugge[18], Brian P. Saunders[19], Michel Robaszkiewicz[20], Stefan Seewald[21], Sergey Kashin[22], Jean-Marc Dumonceau[23], Cesare Hassan[24], Pierre H. Deprez[17]

ESD can be considered for lesions with high suspicion of limited SMI based on:

- Depressed morphology
- Irregularity
- Non Granular surface pattern, particularly if the lesions are larger than 20 mm

(strong recommendation, moderate quality evidence)

Endoscopy 2015; 829-54

Guideline

# Endoscopic submucosal dissection: European Society of Gastrointestinal Endoscopy (ESGE) Guideline

**Authors**

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An en bloc R0 resection is considered curative if:

- well-differentiated adenocarcinoma (G1/G2)
- sm1 (≤ 1 mm submucosal invasion)
- no lymphovascular invasion

(strong recommendation, moderate quality evidence)

Endoscopy 2015; 829-54

# How

- Pre ESD: Lesion assessment and indication
- ESD: (newer) equipment & technique
- Complications
- Training

IT knife

IT knife2

Hook Knife

Flex Knife

TT Knife

# What has helped

- Water jet with knifes
- Conical Caps
- Line and hook method (fishing line)
- Pocket Creation Method

# How

- Pre ESD: Lesion assessment and indication
- ESD: equipment & technique
- Complications
- Training

# Complications

- Bleeding 5-6%
- Perforation  1- 3%

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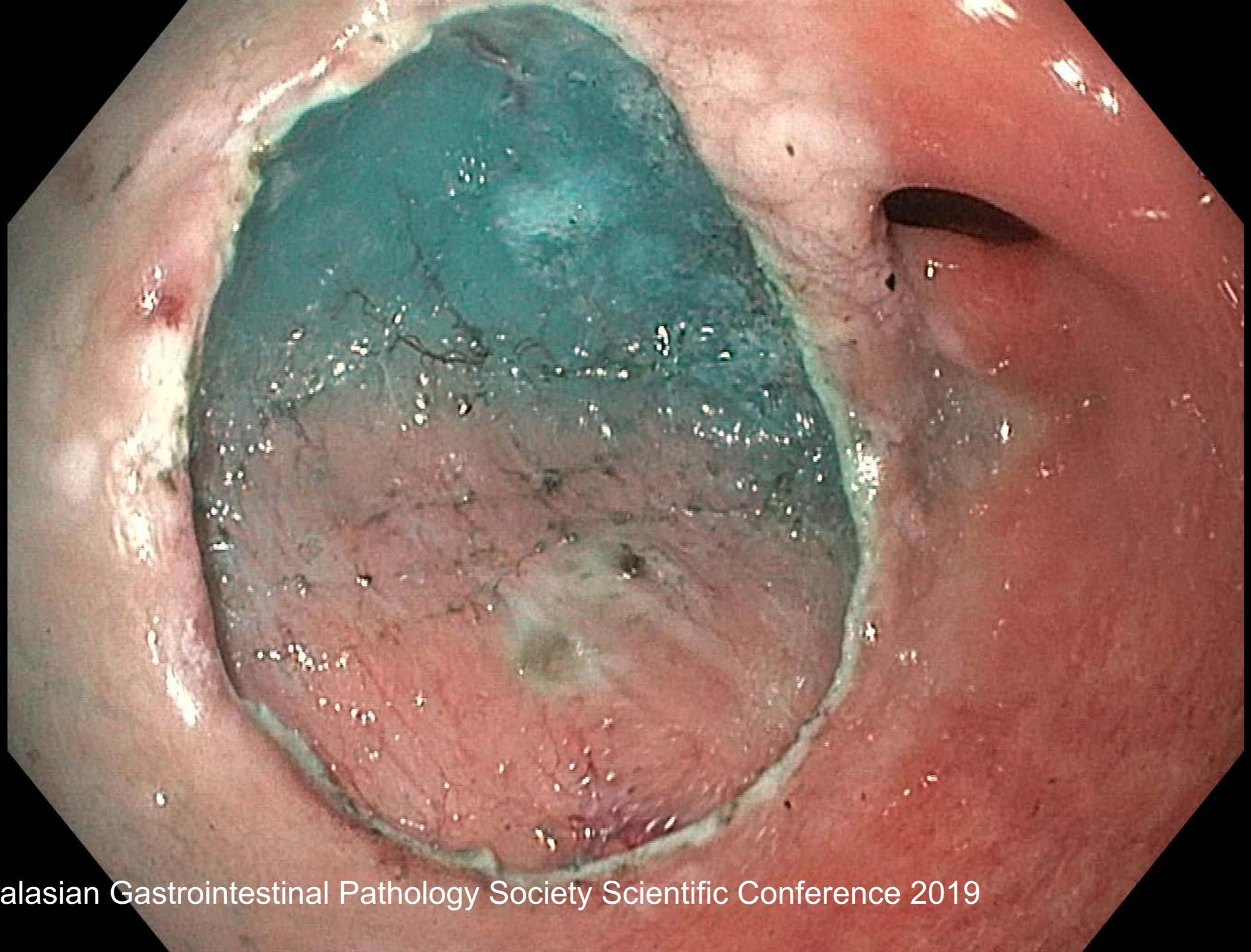

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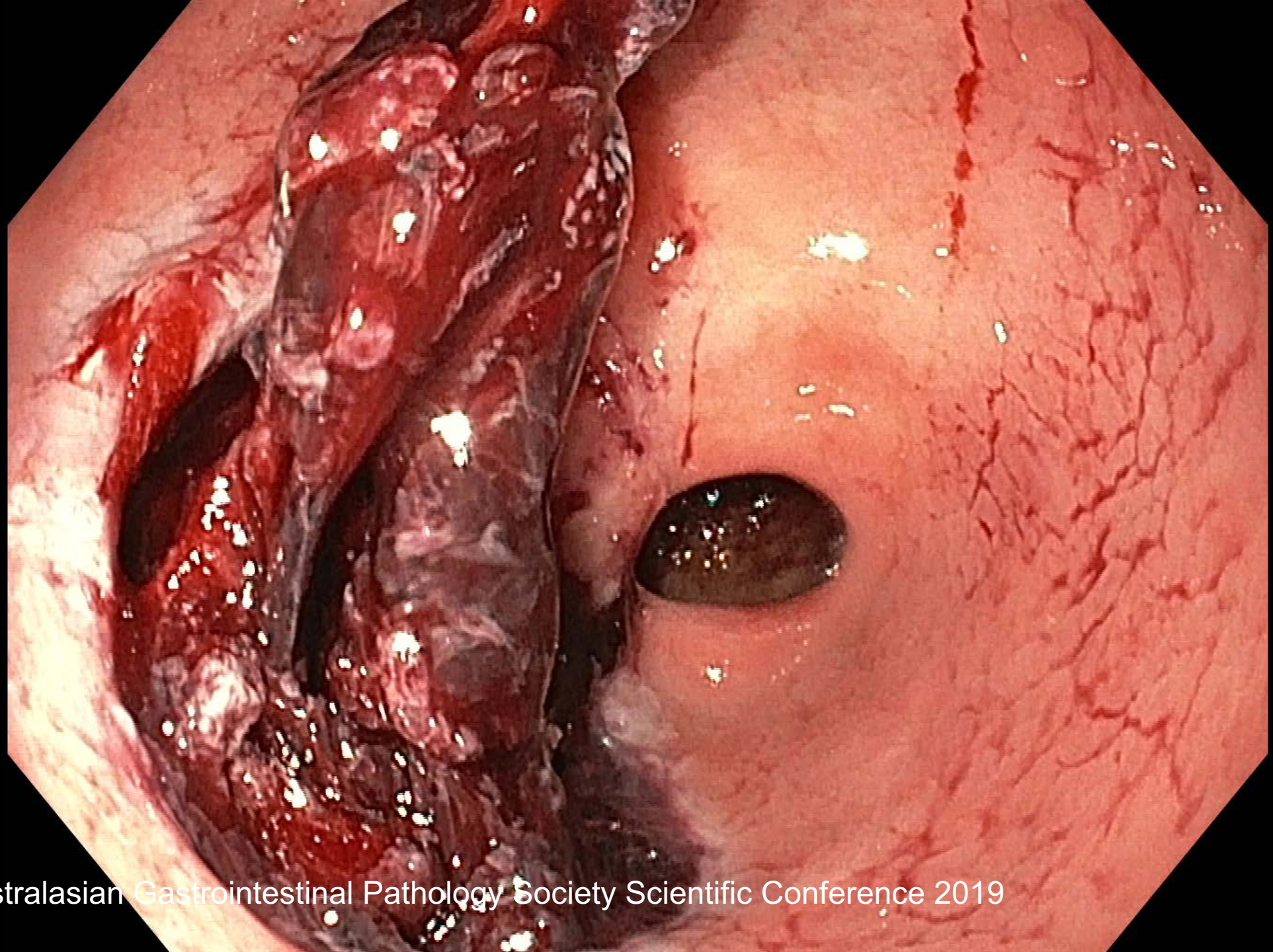

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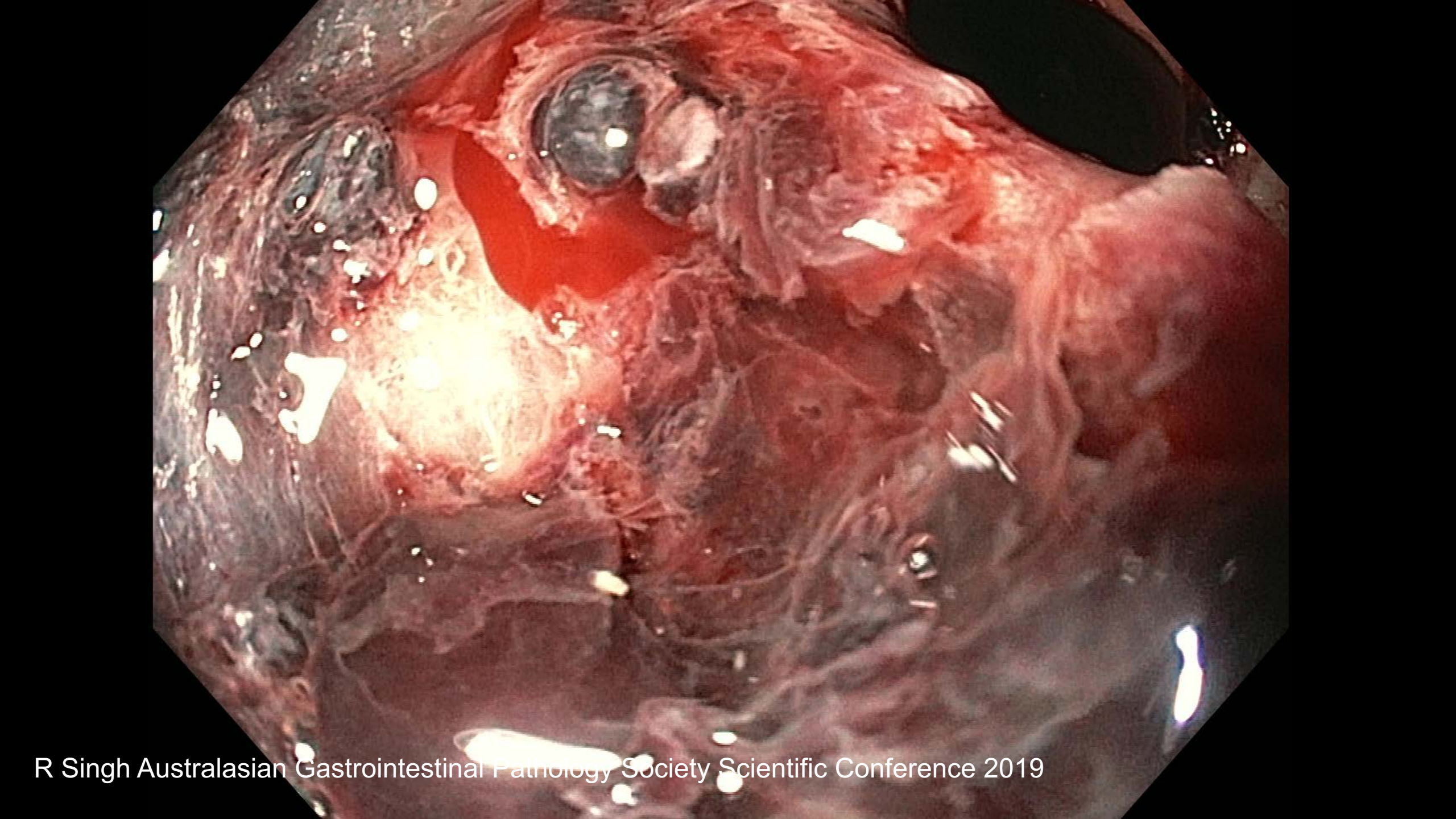

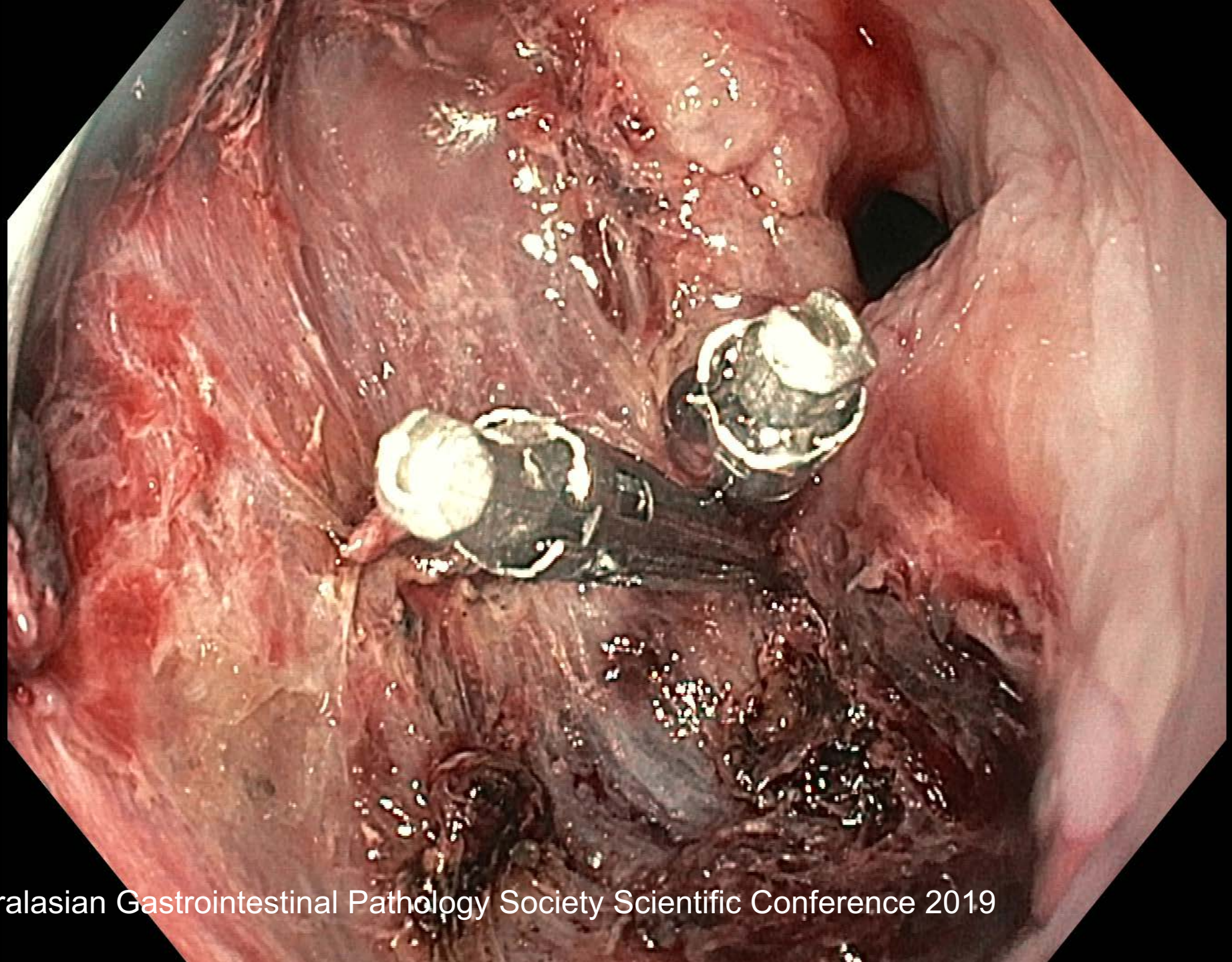

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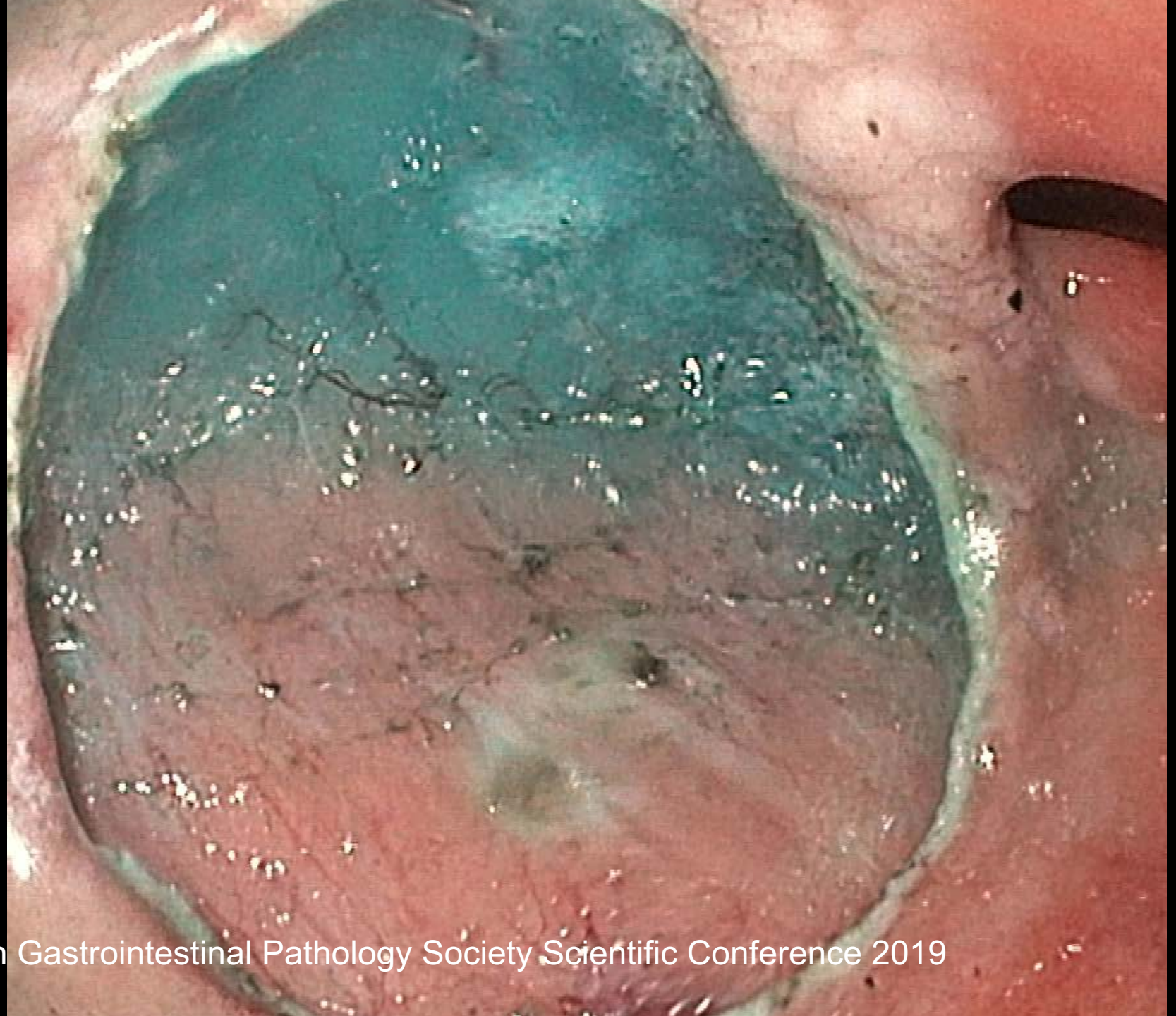

# Complications

- Bleeding 5-6%
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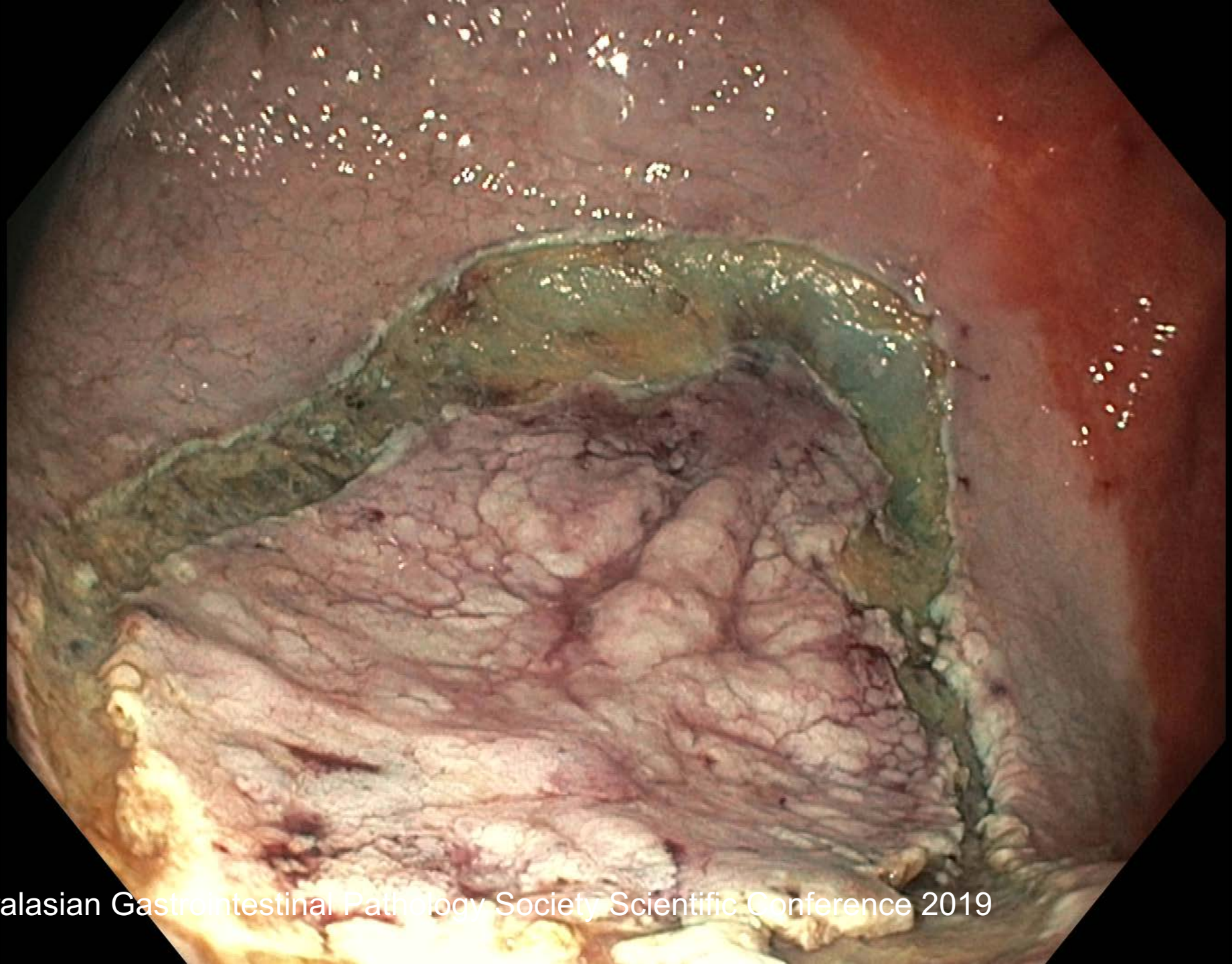

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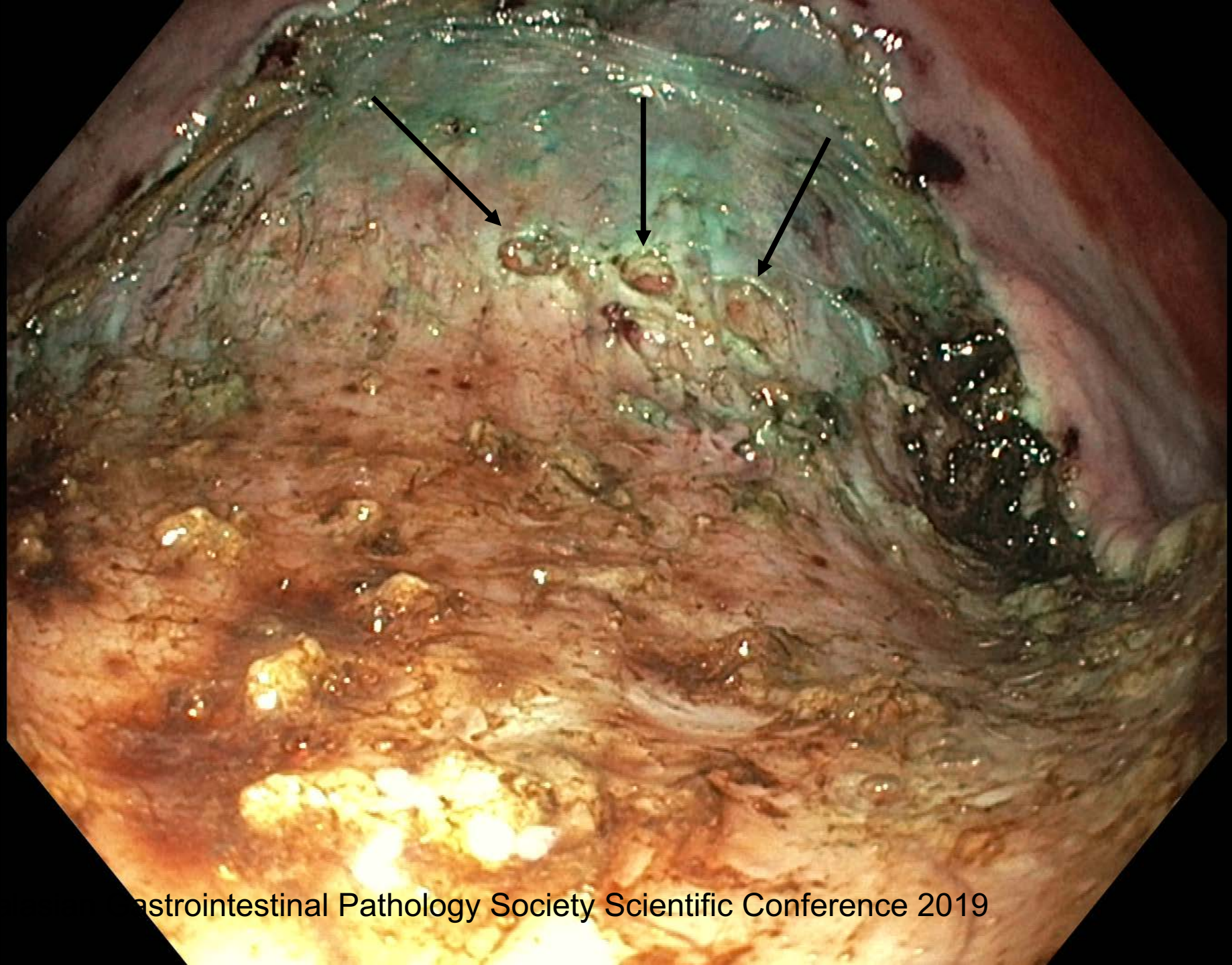

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# How

- Pre ESD: Lesion assessment
- ESD: equipment & technique
- Complications
- Training

# Proposed training for Endoscopists

1) Competent in therapeutic endoscopy
2) Observation: videos, live cases
3) Train on ex vivo models
4) Train on animal models
5) Supervised ESD with experts (10-30 cases)
6) ESD in the antrum (greater curvature)
7) ESD in the rest of the stomach and rectum
8) ESD in the oesophagus
9) ESD in colon ascending and transverse colon
10) ESD in the rest of the colon

# Colon: What Gastroenterologists need

- SSA vs. hyperplastic polyps
- Depth of invasion (um) in submucosal cancers
- ‘Area/volume’ of invasion and risk of LN mets

# Conclusions

Novel mucosal imaging and Endoscopic resection methods in:

- Oesophagus
- Stomach
- Colon

# 5th ADVANCED ENDOSCOPY IMAGING AND RESECTION MASTERCLASS

**7th - 8th February 2020**

## 5th Advanced Endoscopy Imaging and Resection Masterclass

*Friday, 7th February 2020*
*Live cases at Lyell McEwin Hospital, Adelaide*

*Saturday, 8th February 2020*
*Lectures with live stream to Auckland, Perth and Melbourne*
*University of Adelaide, Adelaide*

**COURSE DESCRIPTION**

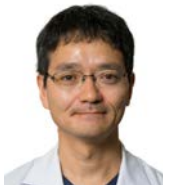
This course aims to teach Endoscopists the latest techniques on Endoscopic imaging with an emphasis on improving the diagnostic ability to detect, characterise and treat oesophageal, gastric, duodenal and colorectal lesions. A combination of cases, didactic lectures and video forums will provide a holistic overview of current diagnosis and treatment paradigms. International and national experts will grace the event and guide you in focused 'Ask the Experts' sessions.

## 5th ADVANCED IMAGING MASTERCLASS

### FACULTY

**Professor Rajvinder Singh**
*MBBS MRCP MPhil FRACP AM FRCP*
*Professor of Medicine, University of Adelaide*
*Director, Gastroenterology Department and Head of Endoscopy*
*Interventional Endoscopist*

### INTERNATIONAL FACULTY



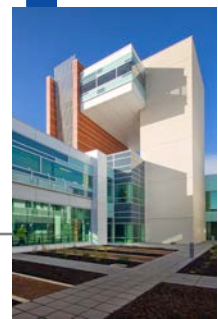
**Professor Noriya Uedo**
*Vice-Director, Department of Gastrointestinal Oncology, Osaka International Cancer Institute, Japan*

Dr. Uedo is a Vice-director of Department of Gastrointestinal Oncology, Osaka International Cancer Institute. His current research interests are application of new endoscopic imaging and therapeutic technique to management of gastrointestinal cancers and establishment of efficient training of advanced endoscopic procedures. He has published 220 articles (PubMed) and now serves as an associated editor of Endoscopy International Open, Digestive Endoscopy and Annals of Gastroenterology.

**Professor Philip Wai Yan, CHIU**
*MD (CUHK), MBChB (CUHK), FRCSEd, FCSHK, FHKAM (Surgery)*
*Department of Surgery, Institute of Digestive Disease, The Chinese University of Hong Kong*

Philip Chiu is Professor of Division of Upper GI and Metabolic Surgery, Department of Surgery; Director of Shaw Endoscopy Center, Institute of Digestive Disease; Director of CUHK Jockey Club Minimal Invasive Surgical Skills Center; Director of CUHK Chow Yuk Ho Technology Center for Innovative Medicine and Assistant Dean (Institutional Affairs), Faculty of Medicine, Chinese University of Hong Kong. Prof. Chiu was the first to perform endoscopic submucosal dissection (ESD) for treatment of early GI cancers and in 2010, he performed the first Per-oral Endoscopic Myotomy (P.O.E.M.). His research interests include upper gastrointestinal bleeding, oesophageal cancer and minimally invasive and robotic oesophagectomy, novel endoscopic technologies for diagnosis of early GI cancers, ESD and novel endoscopic procedures as well as Natural Orifices Transluminal Endoscopic Surgery (NOTES). He has published more than 200 peer reviewed manuscripts and four book chapters.

LYELL McEWIN HEALTH SERVICE



More info, please email me: rajvinder.singh@sa.gov.au

THANK YOU

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rajvinder.singh@sa.gov.au


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