International GI Training Grants

GRANT AWARDS: $10,000 | DEADLINE MARCH 31, 2022

Whether you live in the U.S. or another country, you may be eligible!

Acquire or develop new cognitive knowledge or technical skill to improve patient care in your geographic area. The grant is to be used for travel to and from the training center and to the ACG Annual Meeting as well as for incidental expenses related to the training.

Visit gi.org/trainees/gi-training-grants for more information.
ACG AWARDS

Nominate a Colleague by April 15th!

2022 Award Categories:

• New! NP/PA Award for Clinical Excellence
• Berk/Fise Clinical Achievement Award
• Community Service Award
• Distinguished Mentorship & Teaching Award
• Diversity, Equity & Inclusion Award
• International Leadership Award
• Master of the American College of Gastroenterology
• Samuel S. Weiss Award

Nominations for these awards will be presented at the College’s Annual Scientific Meeting in Charlotte, NC on October 22, 2022.

gi.org/about/awards

TUNE IT UP: A CONCERT TO RAISE COLON CANCER AWARENESS

ACG Virtual Community Event in honor of March Colorectal Cancer Awareness Month

Thursday, March 31, 2022 at 8 pm EDT

Hosted by Dr. Benjamin Levy and ACG Public Relations Committee

American College of Gastroenterology | gi.org/Concert
Participating in the Webinar

All attendees will be muted and will remain in Listen Only Mode.

Type your questions here so that the moderator can see them. Not all questions will be answered but we will get to as many as possible.
How to Receive CME and MOC Points

LIVE VIRTUAL GRAND ROUNDS WEBINAR

ACG will send a link to a CME & MOC evaluation to all attendees on the live webinar.

ABIM Board Certified physicians need to complete their MOC activities by December 31, 2022 in order for the MOC points to count toward any MOC requirements that are due by the end of the year. No MOC credit may be awarded after March 1, 2023 for this activity.

MOC QUESTION

If you plan to claim MOC Points for this activity, you will be asked to: Please list specific changes you will make in your practice as a result of the information you received from this activity.

Include specific strategies or changes that you plan to implement.

THESE ANSWERS WILL BE REVIEWED.
ACG Virtual Grand Rounds
Join us for upcoming Virtual Grand Rounds!

Week 13
Chromoendoscopy in IBD Surveillance: Always, Sometimes or Never?
Gursimran Singh Kochar, MD, FACP, CNSC
March 31, 2022 at Noon Eastern - New! 8pm Broadcast
Join ACG at 8pm on Thursday March 31st for the Tune it Up Concert to Raise Colon Cancer Awareness!

Week 14
CAM and Psychological Therapies for Functional and Inflammatory Bowel Disease
Jill K. Deutsch, MD and Laurie A. Keefer, PhD
April 7, 2022 at Noon Eastern and New! 8pm Eastern!

Visit g1.org/ACGVGR to Register

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American College of Gastroenterology | g1.org/Concert
ACG SPECIAL Grand Rounds
Join us for upcoming Virtual Grand Rounds!

March 29, 2022 at 8:00pm Eastern!
Private Equity in Gastroenterology - "I Went the Private Equity Model: Reflections and Guidance"
Featured Speaker: Scott Frasier, MBA

Disclosures:

Speaker:
Moamen Gabr, MD, MSc
ConMed: Consultant
Medtronic: Consultant

Moderator:
Mohammad Bilal, MD
Dr. Bilal, moderator for this activity, has no relevant financial relationship(s) with ineligible companies to disclose.

*All of the relevant financial relationships listed for these individuals have been mitigated
Endoscopic Submucosal Dissection: What Gastroenterologists Need to Know

Moamen Gabr, MD, MSc
Director of Endoluminal Surgery
Center For Advanced Endoscopy
Beth Israel Deaconess Medical Center
Harvard Medical School
Learning Objectives

- Define advanced endoscopic resection techniques.
- Interpret current guidelines for resection of gastrointestinal neoplasia.
- Explain techniques used in Endoscopic Submucosal Dissection.
- Discuss current status and future advances in endoscopic resection.

Outline

- What’s ESD? Definitions
- Indications for ESD? Guidelines
- How? Devices, techniques
- Complications
- Current status and Future perspectives
Definitions

• EMR
• Cap EMR
• Band EMR
• P-EMR


EMR (Injection Assisted or Conventional)

• Solution is injected via a needle into the submucosal space beneath the lesion to create a safety cushion.
• The lesion is then lifted for a snare to cut.
• The fluid cushion under the lesion facilitates the capture by the snare and minimizes mechanical and cautery damage to deeper layers.
Cap-assisted EMR (Cap-EMR)

- A transparent cap is attached to the tip of the scope. A specially designed snare is opened and positioned on the internal ridge at the tip of the cap.
- Lesion suctioned into the cap.
- Once retracted completely into the cap, electrocautery snare is closed to resect the lesion. Submucosal injection may be used to facilitate suction and provide a cushion.


Ligation-assisted EMR (Band EMR)

- A band ligation device is attached to the tip of the endoscope.
- Suction is applied to retract the lesion into the cap.
- The band is then released to ligate the lesion, creating a pseudopolyp.
- Once ligated, the lesion can be removed by electrocautery snare.
- Submucosal injection can be used before suctioning to facilitate creating the pseudopolyp.
• The lumen is completely deflated of gas.
• Followed by total immersion of the lesion in sterile water using a mechanical water pump
• The lesion and the surrounding mucosa is then snared using electrocautery.

Underwater versus conventional EMR for colorectal polyps: systematic review and meta-analysis

Alyssa Y. Choi, MD,1,4 Zain Moosvi, MD,1,4 Sagar Shah, BS,5 Mary Kathryn Roccato, MD,1 Andrew Y. Wang, MD,3 Christopher M. Hamerski, MD,1 Jason B. Samarasena, MD1

<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Conventional Events Total</th>
<th>Underwater Events Total</th>
<th>Odds Ratio (Non-event) M-H, Fixed, 95% CI Year</th>
<th>Odds Ratio (Non-event) M-H, Fixed, 95% CI</th>
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<tr>
<td>Liverant 2016</td>
<td>12</td>
<td>31</td>
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<tr>
<td>Schenck 2017</td>
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<td>1.48 [0.72-3.04] 2019</td>
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<td>Rodriguez 2019</td>
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<td>1.69 [0.86-3.34] 2019</td>
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<td>Yamazaki 2019</td>
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<td>2.74 [1.20-5.78] 2019</td>
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<tr>
<td>Yen 2020</td>
<td>32</td>
<td>50</td>
<td>1.35 [0.62-2.94] 2020</td>
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<tr>
<td>Hamerski 2020</td>
<td>35</td>
<td>145</td>
<td>2.91 [1.78-4.76] 2020</td>
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<td>Total (95% CI)</td>
<td>623</td>
<td>614</td>
<td>1.84 [1.42-2.39]</td>
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<tr>
<td>Total events</td>
<td>324</td>
<td>388</td>
<td></td>
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</tr>
</tbody>
</table>

Heterogeneity: $\chi^2 = 9.75, df = 6 (P = .14)$, $I^2 = 38\%$

Test for overall effect: $Z = 4.58 (P < .00001)$

Underwater versus conventional EMR for colorectal polyps: systematic review and meta-analysis


<table>
<thead>
<tr>
<th>Study or Subgroup</th>
<th>Conventional</th>
<th>Underwater</th>
<th>Odds Ratio (Non‐event)</th>
<th>Year</th>
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<tr>
<td></td>
<td>Events</td>
<td>Total</td>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>Liverani 2016</td>
<td>6</td>
<td>31</td>
<td>0</td>
<td>2016</td>
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<tr>
<td>Schneck 2017</td>
<td>13</td>
<td>46</td>
<td>4</td>
<td>2017</td>
</tr>
<tr>
<td>Rodriguez 2019</td>
<td>14</td>
<td>78</td>
<td>1</td>
<td>2019</td>
</tr>
<tr>
<td>Hamerski 2020</td>
<td>16</td>
<td>103</td>
<td>10</td>
<td>2020</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>220</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

Higher Recurrence UEMR

Higher Recurrence CEMR

UEMR vs CEMR

• 108 colorectal lesions in the UEMR group and 102 lesions in the CEMR group

Definitions

Procedural:
- En-bloc
- Piecemeal

Histologic:
- R0
- R1


T-staging of Esophago-gastric cancers

Benefits and Limitations of EMR

- Less technically demanding
- Equipment more available
- Less time consuming
- Lower complications
- En-bloc resection limited by lesion size (up to 2 cm)
- Lower R0 resection rates
- Higher recurrence rates
Transition to ESD

- Endoscopic Submucosal Dissection is performed using an endoscope with a distal attachment, and CO2 insufflation.
- Markings are made around the lesion using either an endoscopic knife or APC.
- The submucosa is expanded with the injection of a liquid solution.
- Mucosal incision and submucosal dissection are performed with ESD knives until the lesion is completely separated from the underlying layers and the specimen is then retrieved.
Indications for ESD

Esophagus

• Barrett’s esophagus and Barret’s neoplasia: HGD, intramucosal carcinoma, adenocarcinoma (T1a and select T1b).

• Squamous cell dysplasia and cancer confined to the superficial esophageal mucosa


Compared to EMR, ESD results in higher en bloc and R0 resection rates for BE-related neoplasia, lower recurrent/residual disease rates and less need for repeat endoscopic resection procedures.

Because of its lower risk of recurrent disease, ESD may avoid the time and costs associated with re-interventions and might reduce the frequency of follow-up endoscopies compared with EMR.
Stomach

- Gastric adenomas with dysplasia
- Early-stage gastric cancer
ER in Gastric Adenocarcinoma

- Endoscopic resection is considered for tumors that have a very low possibility of lymph node metastasis and are suitable for en-bloc resection.

- **Absolute indication**
  - A differentiated-type adenocarcinoma without ulcerative findings (UL0), in which the depth of invasion is clinically diagnosed as T1a. If the diameter is ≤ 2 cm = EMR or ESD and if > 2 cm = ESD.
  - A differentiated-type adenocarcinoma with ulcerative findings (UL1), in which the depth of invasion is clinically diagnosed as T1a and the diameter is ≤ 3 cm.

- **Expanded indication**
  - An undifferentiated-type adenocarcinoma without ulcerative findings (UL0) in which the depth of invasion is clinically diagnosed as T1a and the diameter is ≤ 2 cm.

- **Relative indication**
  - Tumors that do not fulfill the absolute or expanded indications in elderly and high-operative-risk patients with severe comorbidities in whom surgical resection is not possible.

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Colo-rectal

• LST > 2cm with high-risk features on advanced imaging or biopsy confirmed dysplasia.
AGA Institute Clinical Practice Update: Endoscopic Submucosal Dissection in the United States

• All colorectal lesions should be evaluated for suitability for endoscopic resection.
• Most of colorectal neoplasms without signs of deep submucosal invasion or advanced cancer can be treated by advanced endoscopic resection techniques.
• Colorectal neoplasms containing dysplasia confined to the mucosa have no risk for lymph node metastasis and endoscopic resection should be considered as the criterion standard.


AGA Institute Clinical Practice Update: Endoscopic Submucosal Dissection in the United States

• Large (>2 cm) colorectal lesions removed by piecemeal EMR are associated with increased (up to 20%) rates of recurrent neoplasia. ESD enables higher rates of en bloc resection and lower recurrence rates for these lesions.

• Endoscopic resection for colorectal lesions offers significant cost benefit compared with surgery, and case-based ESD selection for high-risk lesions could offer cost savings.

Colorectal Surgeries For Benign Colon Polyps

1,230,458 Colorectal surgeries in the US from 2000 to 2014

Non-malignant polyps 25%
Malignant cancers 75%


Non-neoplastic indications

• Treatment of weight regain after gastric bypass with transoral outlet reduction (ESD-TÖRe)¹

• Management of PPI refractory GERD (ESD-G)²


Devices and Technique

Devices

- Endoscope
- CO2 insufflation
- Distal attachment (clear cap)
- Injection solution
- Endoscopic knife
- Hemostasis devices
- Closure devices
Tunneling, clip traction and pocket creation methods

• Tunneling method: higher en bloc resection rate, shorter operation time.
• Clip traction.
• Pocket creation method:
  • First reported by Hayashi et al for lesions with fibrosis in 2014
  • Ninety-six colorectal tumors: 47 with PCM vs 49 conventional ESD.
  • Higher rates of en bloc resection and curative resection with PCM.
  • Although there was no significant difference in perforation between the two groups, 6% of the control group vs none of the PCM group.
  • PCM enables the endoscopist to safely perform ESD without encountering the difficulties associated with conventional ESD.

Lu JX, Liu DL, Tan YY. Clinical outcomes of endoscopic submucosal tunnel dissection compared with conventional endoscopic submucosal dissection for superficial esophageal cancer: a systematic review and meta-analysis.

ESD Technique
Case # 1

- 45 yo F p/w heartburn and mild dysphagia. EGD showed a 3 cm nodular lesion in the mid esophagus. Bx positive for Sq HGD.
- Case discussed in the tumor board and the consensus was to perform ESD.
Pathology

• ESOPHAGUS, PROXIMAL, ENDOSCOPIC SUBMUCOSAL DISSECTION:
  - EXTENSIVE SQUAMOUS DYSPLASIA/CARCINOMA IN SITU CHANGES.
  - NO EVIDENCE OF INVASIVE CARCINOMA.
  - NEGATIVE RESECTED MARGINS FOR HIGH-GRADE DYSPLASIA.
Case # 2

- 73 F w pmhx of DM and HTN. Pt p/w epigastric abdominal pain an EGD at OSH revealed a nodular area in the gastric antrum (Bx showed adenoma w HGD). Pt was referred for endoscopic resection.
Pathology

- ADENOMA WITH HIGH-GRADE DYSPLASIA.
  - NEGATIVE RESECTED MARGINS.

Follow-up EGD in 3mos showed a clean scar in the gastric antrum. Biopsies unremarkable.

Adverse Events
Bleeding

- Ranges from 0.2% to 11.9%.
- Classified into immediate (intra-procedural) or delayed (post-procedural) bleeding.
- According to a meta-analysis, the immediate and delayed bleeding rates are 0.75% and 2.1%, respectively.
- Immediate bleeding:
  - Active bleeding that develops during the procedure.
  - Bleeding during ESD is common and is not considered a complication so long as it does not interfere with the safe completion of the procedure.
  - Prevention: by pre-coagulation with a knife or coagulation forceps.


Bleeding

- Delayed bleeding:
  - Melena or bloody stools occurring after the completion of the procedure associated with hemoglobin drop > 2g/dl.
  - Mainly occurs between 2 and 7 days after the procedure. However, it can occur as late as 2 weeks.
  - Prevention: large visible exposed vessels or any remaining visible vessels after a complete resection must be coagulated using hemostatic forceps. Closure of the resection site if applicable. Use of hemostatic polymers.

Perforation

- Classified as:
  - **Immediate**: endoscopic evidence of a definite mural defect with the visualization of an intraperitoneal organ or peritoneal/fat tissue.
  - **Delayed**: after the completion of endoscopic resection by the presence of free air on abdominal plain radiograph or during computed tomography (CT) scan in a symptomatic patient.

- Management:
  - Small perforations that occur during the procedure can be successfully treated with the application of endoscopic clips along with antibiotics and fasting.
  - For large perforations, endo-loop with clipping, endoscopic suturing or over-scope clips can be used for the closure of perforation.
  - If perforation is not completely closed, emergent surgery should be performed as soon as possible to reduce the risk of pan-peritonitis.

Post ESD Strictures

- Narrowing through which a standard scope fails to advance.
- Incidence rates:
  - Esophageal ESD: 11.6% - 17.2%
  - Gastric ESD: 0.7% - 3.8%.
- Prevention: Steroid injection, oral steroids, early endoscopic dilation.
- Most strictures respond to endoscopic therapy and requiring between 1-2 sessions.
Complications of ESD in the US

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Non-Asian countries</th>
<th>Asian countries</th>
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</thead>
<tbody>
<tr>
<td>En bloc resection</td>
<td>81.2%</td>
<td>93%</td>
</tr>
<tr>
<td>R0 resection</td>
<td>71.3%</td>
<td>85.6%</td>
</tr>
<tr>
<td>Need for surgery (due to AEs)</td>
<td>3.1%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Delayed bleeding</td>
<td>4.2%</td>
<td>2.4%</td>
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<tr>
<td>Perforation</td>
<td>8.6%</td>
<td>4.5%</td>
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<tr>
<td>Oncologically curative resection</td>
<td>67.2%</td>
<td>84.1%</td>
</tr>
<tr>
<td>Recurrence post-R0 resection</td>
<td>5.2%</td>
<td>1.1%</td>
</tr>
</tbody>
</table>


ESD Subtypes

• In the Guidelines, specific terminology is used to distinguish several forms of ESD:
  • Dissection of the SM layer is completed without using a snare = “actual (narrowly defined) ESD”.
  • Snaring is carried out without dissecting the SM layer after incising the circumference of the lesion by using a knife for ESD = “precutting EMR”.
  • SM layer is dissected and snaring is carried out after the ESD procedure (mucosal incision + SM dissection) = “hybrid ESD”

Future of ESD

• Newer ESD knives that offer injection during resection are becoming very popular.

• New devices for traction and counter traction:
  • Over-tube based.
  • Second articulating arm based.
  • Clip based.

• Robotic assisted ESD (Flexible Robotic System)
Over-tube based Traction Devices

Video credits go to Mohamed Othman, MD
Articulating Arm-based Traction Devices

Robotic assisted ESD

- Components
  - Stable platform
  - Console with a user interface to control movement of the robot
  - Drive to execute robotic positioning
  - Instrument support assembly
Take home message

• ESD enables complete removal of lesions that are too large for en-bloc endoscopic mucosal resection or are at increased risk of containing cancer.
• Early neoplastic GI lesions should be evaluated for suitability for endoscopic resection in a multidisciplinary approach based on current guidelines.
• Endoscopic resection for superficial GI tumors offers a great value in preservation of the native organ as well as significant cost benefit compared to surgery.
• Further development of endoscopic resection platforms will help increase procedure safety and reduce time.
Questions?

Speaker: Moamen Gabr, MD, MSc

Moderator: Mohammad Bilal, MD

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