Supplementary Table 1. Likert Scales.

Accuracy rating by a 6-point Likert scale	
1	Completely incorrect
2	More incorrect than correct
3	Approximately equally correct and incorrect
4	More correct than incorrect
5	Nearly all correct
6	Correct

Completeness rating by a 3-point Likert scale	
1	Incomplete, addresses some aspects of the question, but significant parts are missing or incomplete
2	Adequate, addresses all aspects of the question and provides the minimum amount of information required to be considered complete
3	Comprehensive, addresses all aspects of the question and provides additional information or context beyond what was expected

Comprehensibility rating by a 3-point Likert scale	
1	Difficult to understand
2	Partly difficult to understand
3	Easy to understand

Supplementary Table 2. Complete list of all questions and ChatGPT's answers to them.

Q1. What is the anatomy of the gastrointestinal tract?

A1:

The gastrointestinal tract is an important component of the human digestive system, responsible for the digestion of food and the absorption of nutrients. The following is an introduction to the main anatomical structures of the gastrointestinal tract:

1. Oral cavity: The starting point of the digestion process, where the oral cavity grinds food and begins the digestion of carbohydrates through teeth, salivary glands, and tongue.

2. Pharynx: The muscular channel connecting the oral cavity and esophagus, responsible for pushing food from the oral cavity to the esophagus.

3. Esophagus: A narrow and long tube that connects the pharynx and stomach, helping food move towards the stomach through peristalsis (a wave like muscle contraction).

4. Stomach: A large muscular bag used to further crush food and break it down through stomach acid and enzymes.

5. Small intestine: Divided into three parts, namely the duodenum, jejunum, and ileum. The small intestine is the main site for nutrient absorption, and its inner wall has a large number of microvilli to increase the absorption surface area.

6. Large intestine: Composed of the cecum, colon (ascending colon, transverse colon,

descending colon, and sigmoid colon), and rectum. The large intestine is mainly responsible for absorbing water and forming feces.

7. Anus: The final part of the digestive tract, responsible for excreting undigested residues in the body.

The design of this system ensures that food can be effectively decomposed, nutrients can be absorbed, and ultimately waste is discharged from the body.

RA1：

The gastrointestinal tract is an important component of the human digestive system, mainly responsible for the digestion of food and the absorption of nutrients. It starts from the oral cavity and extends to the anus, including the following main structures:

1. Oral cavity: It is the starting point for food to enter the body, where teeth, tongue, and saliva help grind and preliminarily break down food.

2. Pharynx: Located between the oral cavity and the esophagus, it is a passage through which food passes, connecting the respiratory and digestive systems.

3. Esophagus: It is a narrow tube that transports food from the pharynx to the stomach, pushing it down through peristaltic movement.

4. Stomach: An organ similar to a bag, whose inner wall secretes stomach acid and digestive enzymes, helping to further break down food and also serving as a temporary storage place for food.

5. Small intestine: Divided into three parts, namely the duodenum, jejunum, and ileum. The small intestine is the main site for nutrient absorption, and its inner wall

is covered with a large amount of villi, increasing the absorption area.

6. Large intestine: Including the cecum (and its associated appendix), colon (ascending colon, transverse colon, descending colon, and sigmoid colon), and rectum. The large intestine is mainly responsible for absorbing water and electrolytes, ultimately forming and storing feces.

7. Anus: It is the last part of the digestive system, which is excreted from the body through anal feces.

This system ensures that food is properly digested and broken down so that nutrients can be absorbed, while undigested residues are effectively eliminated.

Q2. What are the surgical indications/indications for ESD/EMR? (Based on the patient's symptoms, signs, relevant testing indicators, imaging, etc.)

A2：

Endoscopic mucosal dissection (ESD), Endoscopic Submucosal Dissection and Endoscopic Mucosectomy (EMR), Endoscopic Mucosal Restoration is two commonly used endoscopic techniques for the treatment of early gastrointestinal tumors. Here are some main surgical indications and indications for these two techniques, including patient symptoms, physical signs, relevant detection indicators, and imaging data:

Indications for ESD/EMR

1. Early tumors:

Early gastrointestinal cancer: superficial cancer (limited to the mucosal layer or submucosal layer).

Especially suitable for lesions with a diameter greater than 2 centimeters, as these lesions are difficult to completely remove in one go through EMR.

2. Submucosal tumors:

Such as polyps or other benign lesions, including gastrointestinal stromal tumors (GIST), lipomas, etc.

3. High grade intraepithelial neoplasia (HGD):

High grade intraepithelial lesions involving the stomach, esophagus, colon, and rectum.

Surgical indications

1. Symptoms:

Usually suitable for asymptomatic or mildly symptomatic patients, symptoms may include mild bleeding or discomfort.

2. Physical signs:

Lesions may be detected during endoscopic examination, manifested as polyps, protrusions, or local mucosal changes.

3. Related testing indicators:

Biomarkers: such as abnormalities in tumor markers (under specific circumstances).

Endoscopic biopsy: showing high-grade intraepithelial neoplasia or early cancer.

4. Imaging:

Endoscopic ultrasound (EUS): used to evaluate the depth of tumor invasion and whether there is submucosal expansion.

Magnetic resonance imaging (MRI) or computed tomography (CT): used in some cases to assist in evaluating the involvement of deep structures and the condition of surrounding tissues.

Colored endoscopic techniques, such as NBI (Narrow band Imaging), help identify the microscopic structure of the mucosa for diagnosis and determination of the extent of resection.

In practical operation, each patient's situation is different, so the decision on whether to use ESD or EMR should be based on comprehensive evaluation, including pathological, imaging, and physiological function information. The selection of these surgeries also needs to consider the patient's overall health status, surgical risks, and postoperative recovery.

RA2：

Endoscopic mucosal resection (EMR) and endoscopic mucosal dissection (ESD) are two techniques used to treat early gastrointestinal tumors. These methods allow doctors to remove tumors or other lesions from the digestive tract through endoscopic instruments without undergoing open surgery. The following are the main indications and indications for these surgeries:

Indications for ESD and EMR:

1. Localized early tumors:

Early gastric cancer, esophageal cancer, and colorectal cancer are limited to the mucosal layer or submucosal layer, with no signs of lymph node metastasis.

2. High grade intraepithelial neoplasia (HGD):

High grade intraepithelial neoplasia or precancerous lesions found in the stomach, esophagus, colon, and rectum.

3. Submucosal tumors (such as gastrointestinal stromal tumors GIST):

Small, localized submucosal tumors are expected to be completely removed through endoscopic techniques.

The main surgical indications include:

1. Symptoms:

Many times, early tumors may be asymptomatic, but some patients may experience bleeding, difficulty swallowing, or non-specific abdominal discomfort.

2. Physical signs:

Tumors or lesions may be unexpectedly detected during routine or screening endoscopic examinations.

3. Related testing indicators:

Endoscopic biopsy: Confirms the lesion as a high-grade lesion or early-stage cancer.

Blood tests: may include tumor markers, although these are usually not used for screening.

4. Imaging evaluation:

Endoscopic ultrasound (EUS): Evaluate the precise depth of the lesion and determine if it is limited to the mucosa or submucosa.

Computed tomography (CT) or magnetic resonance imaging (MRI): helps to evaluate local lesions and surrounding tissue structures, and check for lymph nodes or distant metastases.

Advanced imaging technologies such as endoscopic narrowband imaging (NBI) can improve the sensitivity of detecting and diagnosing early tumors, helping to plan the scope of surgical resection.

The choice between EMR or ESD mainly depends on the size, type, location of the lesion, and the expected difficulty of resection. ESD provides greater flexibility and complete resection compared to EMR, especially suitable for large or complex shaped lesions. Before performing these surgeries, it is usually necessary to conduct a comprehensive evaluation of the patient, including but not limited to the above examinations and indicators, to determine the most suitable treatment plan.

Q3. What is the specific surgical process for ESD/EMR?

A3：

Endoscopic mucosal resection (EMR) and endoscopic mucosal dissection (ESD) are two commonly used endoscopic techniques for removing early cancer and other lesions in the digestive tract. These two techniques are mainly performed through endoscopy, avoiding the need for open surgery. Below is a brief introduction to the methods and processes of these two surgeries:

Endoscopic mucosal resection (EMR)

Steps:

1. Endoscopic insertion: Inserting the endoscope directly into the target area through the mouth or anus.

2. Localization of lesions: Using the video function of endoscopy to view the location of lesions and evaluate them.

3. Lesion marking: Using special dyes or marking tools to mark around the lesion.

4. Liquid injection: Injecting physiological saline or other suitable liquid into the mucosa and submucosa below the lesion to make the lesion protrude for easy removal.

5. Removal: Using a trap (such as a thermal trap) or other cutting tools to surround and remove the protruding lesion.

6. Lesion removal: Removing the excised tissue through endoscopy.

7. Hemostasis and repair: If necessary, hemostasis should be performed and appropriate repair should be performed on the excised area.

Endoscopic mucosal dissection (ESD)

Steps:

1. Endoscopic insertion: Similar to EMR, reaching the lesion site through endoscopy.

2. Localization and labeling of lesions: Conducting a detailed visual assessment of the lesion and accurately labeling its surroundings.

3. Injecting liquid: Injecting the mucosa and submucosa below the lesion to make the lesion protrude, which helps with subsequent precise cutting.

4. Preliminary incision: Using a specially designed electric knife to make a preliminary incision around the lesion.

5. Peeling: Carefully peeling off the lesion and its roots to ensure that the lesion is removed while preserving as little normal tissue as possible.

6. Integrity check: Confirming whether the excised lesion is intact to evaluate whether further treatment is needed.

7. Lesion removal: Removing the diseased tissue through endoscopy.

8. Hemostasis and repair: Thoroughly stop bleeding and make necessary repairs to the surgical area.

Differences and Choices:

ESD can achieve complete resection of larger and more complex lesions compared to EMR, making it suitable for larger or poorly defined lesions.

EMR is more suitable for smaller and clearly defined lesions, and the surgical process is relatively simple and fast.

Both surgeries should be performed under the guidance of experienced endoscopists to ensure safety and success rate. These processes are usually performed in an endoscopic room, and in most cases, local anesthesia and/or sedation are used. After surgery, patients need to be briefly observed in the hospital to monitor possible complications such as bleeding or perforation.

RA3：

Endoscopic mucosal resection (EMR) and endoscopic mucosal dissection (ESD) are

two advanced endoscopic surgical techniques mainly used to treat early cancer and benign lesions of the digestive tract. These technologies allow doctors to accurately remove diseased tissue from the digestive tract through endoscopy. The following are the basic steps for these two surgeries:

EMR (endoscopic mucosal resection)

Step Overview:

1. Endoscopic insertion: Inserting the endoscope through the mouth or anus to reach the target area.

2. Localization of lesions: Endoscopic cameras help identify and locate lesions.

3. Local injection: Injecting saline or other solutions under the mucosa around the lesion to raise the lesion area and facilitate resection.

4. Removal: Using traps, electrocoagulation knives, or other specialized tools to surround the lesion for removal.

5. Tissue extraction: The excised tissue is removed from the body through endoscopy and sent for pathological examination.

6. Hemostasis: If necessary, using electrocoagulation or hemostatic clips to treat bleeding points in the excised area.

ESD (endoscopic mucosal dissection)

Step Overview:

1. Endoscopic insertion: The endoscope is also inserted into the lesion site through the mouth or anus.

2. Lesion marking: Marking around the edge of the lesion to ensure accurate resection

range.

3. Local injection: Inject solution below the lesion to make the lesion area protrude, which is beneficial for dissection.

4. Incision: Making a fine incision around the lesion to isolate it.

5. Peeling: Using special endoscopic tools, such as IT knives or electric knives, to carefully peel off submucosal lesions along the pre cut edges.

6. Tissue extraction: The diseased tissue after dissection is removed through endoscopy.

7. Hemostasis and repair: Performing necessary hemostasis treatment and evaluate whether further repair measures are needed.

Choices and advantages

EMR is usually suitable for small and clearly defined lesions, and the operation is relatively simple and fast.

ESD can achieve complete resection of larger lesions, especially suitable for lesions with unclear boundaries or larger sizes, but it requires higher technical requirements and longer operation time.

Both of these technologies can greatly reduce the need for traditional open surgery, reduce patient risk and recovery time. Before performing these surgeries, patients usually need to undergo a detailed preoperative assessment, including endoscopic examination, imaging examination, and other necessary physical examinations, to ensure the safety and effectiveness of the surgery.

Q4. What are the contraindications for ESD/EMR?

A4：

Although ESD (endoscopic mucosal dissection) and EMR (endoscopic mucosal resection) are effective methods for treating early gastrointestinal lesions, they are not applicable to all patients. Before performing these surgeries, doctors will evaluate the patient's overall condition and specific contraindications to ensure the safety of the surgery. Here are some common contraindications:

Common contraindications for ESD and EMR

1. Patients with poor overall condition:

For patients with extremely weak physical conditions or serious systemic diseases (such as active heart disease, decompensated liver cirrhosis, severe renal failure, etc.), performing these surgeries may pose a high risk.

2. Coagulation dysfunction:

Patients who are prone to bleeding or are using anticoagulant drugs and cannot be stopped have an increased risk of bleeding during surgery.

3. Inappropriate lesion characteristics:

Suspected or confirmed cases of deep muscle involvement or lymph node metastasis may not be completely eradicated by endoscopic surgery.

4. Severe organ dysfunction:

If there is severe cardiopulmonary dysfunction, it may not be tolerated during surgery

or anesthesia.

5. Adverse local conditions:

The location of the lesion is difficult to reach or the operating space is insufficient, such as in certain curved areas of the digestive tract, which may make endoscopic surgery very difficult or unsafe.

Contraindications specific to ESD

Due to the complexity of ESD technology compared to EMR, which involves deeper dissection and larger resection, there are additional contraindications:

1. Excessive lesion range:

If the lesion area is extremely large, making it extremely difficult or risky to complete a one-time resection, other treatment methods may need to be considered.

2. Unclear depth of lesion invasion:

If the preoperative evaluation cannot accurately determine the depth of invasion of the lesion, there is a risk of deep invasion, ESD may not be the best choice.

In actual clinical practice, for patients with contraindications, doctors will choose the most suitable treatment plan based on the specific situation, which may include switching to traditional surgical or other non-surgical treatment methods. Patients should have detailed discussions with their doctors before undergoing such endoscopic surgery to ensure safety and effectiveness.

RA4：

Endoscopic mucosal dissection (ESD) and endoscopic mucosal resection (EMR) are

minimally invasive surgical methods used to remove gastrointestinal tumors. In some cases, these surgeries may not be suitable for certain patients, indicating contraindications. The main contraindications include:

1. Serious comorbidities:

There are serious cardiovascular diseases, liver and kidney failure, or other major systemic diseases that may increase the risk of surgery.

2. Inability to tolerate anesthesia:

Due to basic health conditions, patients may not be able to tolerate general or local anesthesia.

3. Coagulation disorders:

The patient has coagulation dysfunction or is currently using anticoagulants and cannot stop the medication before surgery.

4. Deep tumor invasion:

The tumor has invaded the deep tissue or muscle layer of the digestive tract and is not suitable for endoscopic resection, requiring surgical intervention.

5. Tumors that cannot be fully exposed:

The location of the tumor is not suitable for endoscopic resection, and endoscopic equipment may not be able to effectively expose the lesion area due to its shape, size, or location.

6. Active infection:

There is active infection of digestive tract or other infectious diseases that may affect the surgical effect and the patient's recovery.

7. Other health conditions:

Other health conditions that increase the risk of surgery, such as severe malnutrition or multiple organ dysfunction.

Before considering receiving ESD or EMR, patients should fully discuss their condition and surgical risks with their doctors to ensure the safety and effectiveness of the surgery.

Q5. What should patients do before ESD/EMR?

A5：

Before undergoing endoscopic mucosal resection (EMR) or endoscopic mucosal dissection (ESD), patients should typically follow the following guidelines to ensure smooth surgery and minimize risks:

1. Dietary preparation:

Doctors usually require patients to fast a few hours before surgery. Usually, patients are not allowed to eat or drink after midnight, but the specific time depends on the surgery time and the doctor's advice.

Dietary adjustments may be necessary one or a few days before surgery, such as switching to a light or liquid diet.

2. Drug adjustment:

Notifying the doctor of all medications you are taking, including prescription drugs,

over-the-counter drugs, herbs, and supplements.

It may be necessary to adjust the dosage of anticoagulants or antiplatelet drugs, or even suspend their use, to reduce the risk of bleeding.

If you have chronic diseases, such as hypertension or diabetes, your doctor will provide special drug management advice.

3. Physical examination and evaluation:

Basic examinations such as blood tests, electrocardiograms, etc. may be required before surgery to evaluate surgical adaptability.

Discussing the risks, potential side effects, and expected outcomes of the surgery with the doctor, and ensuring that the surgical plan is fully understood and agreed upon.

4. Other preparations:

Finding a family member or friend to accompany you as you may need assistance and care after the surgery.

Wearing comfortable clothing to the hospital or clinic and bring necessary documents and insurance information.

These are general guidelines, and specific requirements should be provided and followed by your medical team.

RA5：

Before undergoing endoscopic mucosal resection (EMR) or endoscopic submucosal dissection (ESD), patients should usually make the following preparations:

1. Dietary guidance:

Fasting should be done a few hours before surgery, and usually no solid food or water should be consumed after midnight, depending on the scheduled time of the surgery and the doctor's instructions.

Before surgery, it may be required to follow a special diet, such as a liquid or light diet, to clear the gastrointestinal tract.

2. Drug management:

Notifying the doctor of all medications being taken, including prescription drugs, over-the-counter drugs, and supplements.

According to the doctor's advice, it may be necessary to discontinue the use of anticoagulants or other medications to reduce surgical risks, especially the risk of bleeding.

3. Preoperative evaluation:

Relevant physical examinations, including blood tests, electrocardiograms, etc., may be required before surgery to ensure that the physical condition is suitable for the surgery.

If you have other chronic diseases, such as hypertension or diabetes, you need to communicate with your doctor about how to manage these diseases.

4. Other preparatory matters:

Arranging for someone to accompany you, as it takes some time to fully recover consciousness after the surgery, and someone is needed to help drive or take care of you after the surgery.

Wear comfortable clothing and bring necessary documents and insurance

information.

These are only general recommendations and should follow the specific guidance of doctors and medical teams

Q6. What preoperative measures for ESD/EMR can help reduce surgical risks?

A6:

Preoperative measures for Endoscopic Submucosal Dissection (ESD) and Endoscopic Mucosal Resection (EMR) are essential to reduce surgical risks and optimize patient outcomes. Below are the key strategies:

1. Patient Selection and Lesion Assessment

Indication confirmation: Ensure the lesion is appropriate for ESD/EMR based on size, morphology, and suspicion of submucosal invasion.

Imaging & staging: Use high-definition endoscopy with chromoendoscopy or NBI, EUS (endoscopic ultrasound), or cross-sectional imaging (CT/MRI) if malignancy is suspected.

Location & accessibility: Evaluate lesion location (e.g., rectum vs esophagus) to anticipate technical difficulty.

2. Risk Stratification

Antithrombotic therapy: Assess bleeding risk in patients on antiplatelet or anticoagulant medications; follow ESGE/ASGE guidelines for perioperative

management.

Comorbidity assessment: Evaluate cardiopulmonary function, diabetes control, and nutritional status.

Anesthesia suitability: Determine if conscious sedation or general anesthesia is more appropriate.

3. Informed Consent and Psychological Preparation

Discuss potential risks, including bleeding, perforation, stricture, and recurrence.

Provide emotional support and education to reduce anxiety and improve compliance.

4. Bowel and Gastric Preparation

Colonic EMR/ESD: Ensure high-quality bowel prep (split-dose PEG-based regimen preferred).

Upper GI ESD: Fasting $\geqslant 6$ hours before procedure; use mucolytic/defoaming agents (e.g., simethicone) pre-procedure to improve visualization.

5. Preoperative Laboratory and Imaging Tests

CBC, coagulation profile (INR, aPTT), liver/renal function tests.

ECG, chest imaging if comorbidities are present or procedure is prolonged.

6. Prophylactic Interventions

Prophylactic antibiotics: Generally not routine unless high-risk factors exist (e.g., perforation risk, prosthetic heart valve).

Proton pump inhibitors (PPI): Initiated pre-procedure for upper GI ESD to reduce post-ESD bleeding risk.

7. Endoscopic Strategy Planning

Plan for possible en bloc vs piecemeal resection.

Anticipate use of devices: injectors, knives, hemostatic forceps, clips, over-the-scope devices if needed.

RA6:

Preoperative measures for Endoscopic Submucosal Dissection (ESD) and Endoscopic Mucosal Resection (EMR) are essential for minimizing complications and ensuring procedural success. These measures involve patient selection, lesion assessment, preparation, and optimization of comorbid conditions. Here's a detailed list of key preoperative strategies:

1. Patient Assessment & Risk Stratification

Medical history review: Especially cardiovascular, pulmonary, renal, and bleeding risks.

Medication review: Discontinue or adjust anticoagulants/antiplatelets based on risk-benefit analysis (often guided by ASGE or ESGE guidelines).

Coagulation profile: Check INR, aPTT, platelet count in patients with bleeding risk or on anticoagulants.

2. Lesion Evaluation

High-resolution endoscopy with chromoendoscopy or virtual chromoendoscopy (NBI, FICE, i-SCAN).

Endoscopic ultrasound (EUS): To assess depth of invasion (especially in esophageal or rectal lesions).

Magnifying endoscopy: To evaluate pit pattern and vascular pattern for malignancy suspicion.

Marking the lesion margins: With electrocautery to guide complete resection.

3. Bowel or Gastric Preparation

Colonic EMR/ESD: Full bowel cleansing with PEG or other regimens to ensure visibility and reduce infection risk.

Upper GI ESD: Fasting (typically 8 hours), possibly with simethicone to reduce bubbles and mucolytics to clear the field.

4. Infection Prophylaxis

Antibiotics: Not routinely used, but consider for high-risk procedures (e.g. duodenal ESD, patients with prosthetic valves).

Helicobacter pylori testing: In gastric lesions; eradication therapy if positive may reduce metachronous lesion risk.

5. Informed Consent & Patient Education

Explain risks: Perforation, bleeding, stricture, need for surgery if incomplete resection or complications.

Discuss alternatives: Surveillance, surgical resection.

Obtain consent for possible conversion to surgery if endoscopic resection is not feasible.

6. Multidisciplinary Evaluation (if needed)

In complex or high-risk lesions: Discuss in tumor board or with surgical team.

7. Anesthesia Planning

ESD often requires deep sedation or general anesthesia depending on location and duration.

Anesthesia assessment is important, especially in elderly or comorbid patients.

Implementing these measures helps reduce complications like bleeding, perforation, incomplete resection, and post-procedure strictures, while improving outcomes and patient safety.

Q7. What are the possible problems and solutions that may be encountered during the ESD/EMR process?

A7：

Endoscopic mucosal dissection (ESD) and endoscopic mucosal resection (EMR) are complex minimally invasive surgeries that may encounter some problems or complications during the process. Understanding potential issues and corresponding solutions can help improve the safety and success rate of surgery. The following are common problems and their solutions during the surgical process:

1. Bleeding:

Problem description: During the surgical process, blood vessels may be damaged during the removal of tumors or polyps, which may lead to bleeding.

Solution: Using electrocoagulation equipment, hemostatic clips, or spray hemostatic agents to control and stop bleeding. After surgery, hemostatic drugs can be

administered and the patient's vital signs and blood condition can be closely monitored.

2. Perforation:

Problem description: During the surgical process, the operation or removal of instruments may result in perforation of the digestive tract wall.

Solution: Small perforations can be closed by placing clips under endoscopy, while larger perforations may require surgical repair. Antibiotics should be administered postoperatively to prevent infection, and abdominal drainage should be performed if necessary.

3. Local tumor residue or recurrence:

Problem description: During the resection process, due to limitations in technology or lesion location, it may not be possible to completely remove the diseased tissue, leading to tumor recurrence.

Solution: Regularly follow up with endoscopic examinations to monitor the risk of recurrence. If necessary, perform another surgical resection or supplement with other treatments, such as radiation therapy.

4. Narrow:

Problem description: During the healing process after extensive resection, scar tissue may cause narrowing of the digestive tract.

Solution: Relief can be achieved through endoscopic dilation or stent placement. Close monitoring of swallowing and digestive function after surgery, and timely handling of stenosis symptoms.

5. Infection:

Problem description: Injury or perforation of the surgical site may increase the risk of infection.

Solution: Trying to maintain aseptic operation during surgery and administering prophylactic antibiotics after surgery. If patients experience symptoms of infection such as fever and abdominal pain, they should seek medical attention immediately.

These issues and solutions may vary depending on individual patient differences and specific circumstances. Prior to surgery, potential risks and preventive measures should be discussed with the doctor to ensure a smooth surgical process.

RA7：

The possible problems and corresponding solutions encountered during endoscopic mucosal dissection (ESD) and endoscopic mucosal resection (EMR) are as follows:

1. Bleeding:

Problem description: During the surgical process, blood vessels or other tissues may be damaged, leading to bleeding, which is the most common complication of ESD/EMR.

Solution: Timely using hemostatic clips, electrocoagulation, or spray hemostatic agents through endoscopy to stop bleeding. If the bleeding volume is large or uncontrollable, it may need to be converted to surgical treatment. The patient's vital signs should be closely monitored after surgery.

2. Perforation:

Problem description: During the surgical process, perforation of the digestive tract wall may occur due to instrument operation or deep lesion location.

Solution: Using endoscopic clipping or other endoscopic repair methods to close the perforation site. If the perforation is large, surgical repair may be required. Antibiotics should be administered postoperatively to prevent infection, and the patient's symptoms should be closely observed.

3. Residual lesions and recurrence:

Problem description: Sometimes it is not possible to completely remove the entire lesion area, resulting in residual or recurrent lesion tissue.

Solution: Regular endoscopic follow-up after surgery to monitor any signs of recurrence. If residual lesions or relapses are found, re surgery or other treatments (such as radiation therapy or chemotherapy) should be performed as soon as possible.

4. Digestive tract stenosis:

Problem description: Scar tissue after extensive resection may lead to esophageal or intestinal stenosis.

Solution: Using endoscopic dilation or stent implantation to alleviate stenosis symptoms. Paying close attention to the patient's swallowing and digestive function after surgery.

5. Infection:

Problem description: Tissue damage caused by surgery may cause local or systemic infections.

Solution: Maintaining sterile procedures before and during surgery, and using

antibiotics if necessary after surgery to prevent or treat infections. If symptoms of infection such as fever and abdominal pain occur, timely medical attention should be sought.

Before performing ESD or EMR, patients should discuss the risks and possible complications with their doctors to develop appropriate surgical plans and ensure sufficient postoperative monitoring and follow-up.

Q8. Will sedation or anesthesia be used during ESD/EMR, and will the procedure cause pain or discomfort? How long does the procedure usually take?

A8:

Sedation or anesthesia is commonly used during Endoscopic Submucosal Dissection (ESD) and Endoscopic Mucosal Resection (EMR) to ensure patient comfort and facilitate a smooth procedure:

1. Sedation or Anesthesia Use

EMR: Typically performed under moderate sedation (e.g., midazolam and fentanyl) or deep sedation using propofol. In some cases, general anesthesia may be used depending on the lesion's location and complexity.

ESD: Often requires deep sedation or general anesthesia, especially when lesions are large, located in the esophagus or stomach, or when prolonged manipulation is expected.

2. Pain or Discomfort

During the procedure, patients generally do not feel pain due to effective sedation or anesthesia.

After the procedure, mild discomfort such as: Abdominal bloating from insufflated air/CO_2, Throat irritation (if upper GI), Mild abdominal pain (if deeper dissection was required), may occur, but is usually temporary and manageable.

3. Procedure Duration

EMR: Typically 15 to 45 minutes, depending on the number, size, and location of the lesions.

ESD: Longer duration, ranging from 1 to 3 hours or more, depending on: Size and location of the lesion, experience of the endoscopist, technical difficulty (e.g., submucosal fibrosis).

RA8:

Endoscopic Submucosal Dissection (ESD) and Endoscopic Mucosal Resection (EMR) are minimally invasive procedures used to remove abnormal tissue (such as precancerous lesions or early-stage cancers) from the digestive tract. Here's how sedation, pain management, and timing typically work for these procedures:

1. Will sedation or anesthesia be used?

Yes, either sedation or general anesthesia is used during both ESD and EMR to ensure you are comfortable and pain-free.

EMR (Endoscopic Mucosal Resection):

Most often performed under conscious sedation (e.g., with midazolam and fentanyl).

You may be drowsy but awake and generally won't remember the procedure.

ESD (Endoscopic Submucosal Dissection):

Often more complex and takes longer, so deep sedation or even general anesthesia may be used.

This ensures you are fully asleep and completely still during the more intricate dissection.

2. Will the procedure cause pain or discomfort?

During the procedure:

You should not feel pain due to sedation or anesthesia.

After the procedure:

Mild discomfort such as sore throat, bloating, or abdominal pain may occur.

More discomfort can happen with ESD compared to EMR because it's more extensive.

Pain is usually well controlled with over-the-counter or prescribed pain relievers.

Serious complications (like bleeding or perforation) are rare but possible; your doctor will monitor you closely.

3. How long does the procedure take?

EMR:

Usually 20 to 60 minutes, depending on the size and location of the lesion.

ESD:

Can take 1 to 3 hours or more, especially for large or complex lesions.

Q9. What cooperation and precautions are required from the patient during an ESD/EMR procedure?

A9:

During an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) procedure, patient cooperation and certain precautions are essential to ensure safety, effectiveness, and a smooth procedure. Here's a breakdown of what is typically required:

1. Pre-Procedure Cooperation and Preparation

Fasting: Patients must fast for 6–8 hours before the procedure (or longer for colon procedures) to ensure an empty gastrointestinal tract.

Bowel Preparation (for colon EMR/ESD): Patients must take prescribed laxatives and follow dietary restrictions for optimal visualization.

Medication Management:

Anticoagulants or antiplatelet drugs may need to be paused based on the doctor's instructions.

Diabetic patients may need to adjust insulin or hypoglycemic agents.

Informing the Physician: Patients should disclose all medications, allergies, and comorbidities (e.g., heart disease, respiratory issues).

2. Cooperation During the Procedure

Remain Still: Patients undergoing the procedure under conscious sedation or anesthesia should lie still and follow any instructions given during positioning.

Minimal Movement: Any sudden body movement, talking, or swallowing (if in the esophagus or stomach) can interfere with endoscope manipulation and increase risks.

Communicate Discomfort (if awake): In cases where only light sedation is used, patients should report unusual pain or discomfort without making abrupt movements.

3. Psychological Preparedness

Stay Calm and Relaxed: Anxiety can lead to increased gastric motility or respiratory instability. Breathing slowly and remaining calm aids procedural success.

Trust the Medical Team: Being mentally prepared and trusting the team helps reduce anxiety and unnecessary movement.

4. Post-Procedure Precautions

Follow Recovery Room Instructions: Patients must remain in the recovery area until vital signs stabilize.

Transportation: If sedation or anesthesia was used, the patient should not drive and must arrange for someone to escort them home.

Observation for Complications: Patients should follow guidance on when to seek help (e.g., signs of bleeding, fever, severe pain).

RA9:

During an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) procedure, patient cooperation and awareness of certain

precautions are essential for procedural safety and effectiveness. These include:

1. Fasting and Bowel Preparation

Upper GI lesions (e.g., esophagus, stomach):

Patients are typically required to fast for at least 6–8 hours before the procedure to reduce aspiration risk.

Lower GI lesions (e.g., colon, rectum):

Bowel cleansing with a prescribed laxative regimen is crucial to ensure clear visualization.

2. Medication Management

Antithrombotic agents (e.g., aspirin, clopidogrel, warfarin):

Patients may need to adjust or temporarily stop these medications before the procedure, based on physician guidance.

Diabetes medications:

Insulin or oral hypoglycemics may need to be modified due to fasting.

3. Sedation Cooperation

Remain still:

Although patients are sedated (moderate to deep sedation or general anesthesia), any unexpected movement can increase risk.

Report discomfort or pain:

If the patient is under conscious sedation, communication is important to ensure safety and comfort.

4. Intra-procedure Awareness

Follow instructions when semi-awake:

Some procedures, especially in the esophagus or rectum, may require brief cooperation like controlled breathing or positional adjustments.

5. Infection Control and Medical History

Disclose full medical history:

Including allergies, implantable devices, recent illnesses, and infectious disease status.

Oral/dental status:

Particularly relevant for upper GI ESD, to avoid aspiration or dental injury during scope insertion.

6. Consent and Psychological Preparedness

Informed consent:

Patients should fully understand the benefits, risks (e.g., bleeding, perforation), and alternatives before proceeding.

Anxiety management:

Cooperation may be compromised if patients are anxious; calm, informed patients usually follow instructions better.

7. Posture and Equipment Tolerance

Correct positioning:

Patients must be able to maintain required positions (e.g., left lateral decubitus) during the procedure.

Tolerate mouthpiece/nasal oxygen/capnography:

These are used for airway protection and sedation monitoring.

By carefully following these instructions and working closely with the medical team, patients can help ensure a smooth and safe ESD/EMR procedure.

Q10. What are the factors influencing the safety and success rate of ESD/EMR procedures?

A10:

The safety and success rate of Endoscopic Submucosal Dissection (ESD) and Endoscopic Mucosal Resection (EMR) are influenced by a combination of lesion-related, patient-related, technical, and operator-related factors. Here is a structured overview:

1. Lesion-Related Factors

Location:

Lesions in the esophagus or colon (especially right-sided colon) are more challenging due to thinner walls and increased perforation risk.

Size and morphology:

Larger or flat/depressed lesions (e.g., LST-NG) increase procedure complexity and adverse event risk.

Submucosal fibrosis:

Common in recurrent lesions or those with previous biopsies or partial resections,

making dissection more difficult.

Histological type:

High-grade dysplasia or invasive carcinoma may increase bleeding risk or indicate deeper invasion, limiting curative resection.

2. Patient-Related Factors

Age and comorbidities:

Elderly patients or those with cardiopulmonary disease have a higher risk of sedation-related complications and poorer healing.

Use of antithrombotic therapy:

Increases bleeding risk; requires careful perioperative management.

Previous abdominal or pelvic surgery:

May lead to anatomical distortion or adhesions complicating endoscopic access.

3. Technical Factors

Procedure type (ESD vs EMR):

ESD enables en bloc resection of large lesions but has a steeper learning curve and higher risk of perforation.

EMR is safer and faster but may lead to piecemeal resection in large lesions, increasing recurrence risk.

Use of adjunctive techniques:

Submucosal injection solutions (e.g., hyaluronic acid), traction devices, or advanced hemostatic tools improve safety and visibility.

Type of electrosurgical unit and settings:

Optimal settings reduce thermal injury and bleeding.

4. Operator-Related Factors

Experience and training:

Higher case volume and dedicated training significantly improve en bloc resection and R0 resection rates while reducing complications.

Institutional support:

Availability of experienced support staff, anesthesia monitoring, and surgical backup improves safety profiles.

5. Postoperative Management

Surveillance protocols:

Early detection of complications or recurrence depends on structured follow-up.

Timely management of adverse events:

Prompt endoscopic hemostasis or perforation closure (e.g., clips, over-the-scope clips) can prevent escalation.

Outcomes Indicators

Success rate indicators:

En bloc resection rate

R0 resection rate (histologically negative margins)

Curative resection rate (no lymphovascular invasion or submucosal invasion)

Safety indicators:

Immediate and delayed bleeding rate

Perforation rate

Need for emergency surgery or prolonged hospitalization

RA10:

The safety and success of Endoscopic Submucosal Dissection (ESD) and Endoscopic Mucosal Resection (EMR) depend on several key clinical, technical, and patient-related factors. These influence both the short-term outcomes (e.g., complication rates) and long-term effectiveness (e.g., complete lesion removal and recurrence rates).

Key Factors Influencing Safety and Success of ESD/EMR

1. Lesion Characteristics

Size: Larger lesions are more difficult to resect en bloc and increase the risk of perforation.

Location: Lesions in certain areas (e.g., esophagus, right colon, or near folds) are technically more challenging.

Depth of Invasion: Lesions confined to mucosa/submucosa are ideal; deeper invasion increases risk of incomplete resection or need for surgery.

Morphology: Flat or depressed lesions are harder to detect and resect completely.

Fibrosis/Scar Tissue: Previous biopsies or inflammation can create fibrosis, complicating dissection.

2. Operator Skill and Experience

Success rates are highly operator-dependent, especially for ESD, which requires advanced training and technical precision.

High-volume centers and experienced endoscopists have lower complication rates and higher en bloc and R0 (complete) resection rates.

3. Equipment and Technology

Advanced tools (e.g., dual knives, insulation-tipped knives, electrosurgical units) improve precision.

High-definition endoscopy, chromoendoscopy, or NBI (narrow-band imaging) helps better delineate lesion margins.

Use of CO_2 insufflation (instead of air) reduces the risk of complications like perforation and post-procedural pain.

4. Patient-Related Factors

Age and general health: Older or comorbid patients have higher anesthesia and complication risks.

Use of anticoagulants/antiplatelets: Increases bleeding risk. Requires careful peri-procedural management.

Anatomical variations or prior surgeries: May make access and resection more difficult.

5. Procedural Techniques

EMR is generally safer for small lesions (<2 cm), while ESD allows for en bloc resection of larger or more complex lesions.

Injection solutions (e.g., saline with epinephrine, hyaluronic acid) help lift the lesion and prevent perforation.

Effective hemostasis management (clips, coagulation forceps) is key during and after

resection.

6. Post-Procedure Care

Proper monitoring and follow-up are crucial to detect and manage complications like:

Delayed bleeding

Perforation

Stricture formation (especially in esophageal or gastric ESD)

Adherence to surveillance protocols ensures detection of recurrence or metachronous lesions.

7.Success Indicators

En bloc resection rate: High (especially important in ESD)

R0 resection rate (clear margins): High

Complication rate: Low (<5–10%, varies by lesion site)

Recurrence rate: Low (<1% for ESD, slightly higher for piecemeal EMR)

Q11. How is the resected tissue handled after an ESD/EMR procedure?

A11:

After an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) procedure, the resected tissue is handled carefully to ensure accurate pathological evaluation. Here's a step-by-step overview of what typically happens:

1. Collection and Retrieval

Tissue retrieval: The resected specimen is retrieved using endoscopic tools such as a retrieval net, forceps, or suction trap.

Orientation preservation: Efforts are made to preserve orientation, especially for en bloc ESD specimens. This helps the pathologist assess margins and depth.

2. Specimen Handling

Specimen pinned or stretched: The specimen (especially from ESD) is pinned flat on a board (e.g., cork) or filter paper with mucosal side up and stretched gently to maintain shape and orientation.

Labeling: The orientation (oral/anal, lateral/medial, etc.) may be marked using ink, sutures, or notches.

3. Fixation

Fixation in formalin: The tissue is immediately immersed in 10% neutral buffered formalin for proper fixation. This preserves cellular detail for pathology.

Fixation duration: Typically fixed for several hours (often overnight) before sectioning.

4. Histopathological Processing

Gross examination: The pathologist examines the specimen for completeness and marks it for sectioning.

Sectioning: The tissue is serially sectioned (e.g., every 2–3 mm) to evaluate the lesion fully.

Microscopic examination: Assesses:

Tumor type and grade

Depth of invasion

Lymphovascular invasion

Margins (lateral and deep)

Completeness of resection (R0 vs R1)

5. Reporting

A detailed pathology report is generated, guiding:

Whether the resection was curative

Need for additional surgery or surveillance

Risk of recurrence or metastasis

RA11:

After an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) procedure, the resected tissue is handled carefully to ensure accurate pathological assessment. Here's a step-by-step overview of how it's typically managed:

1. Retrieval

Method: The resected specimen is retrieved from the GI tract using endoscopic tools such as nets, snares, or grasping forceps.

Precaution: Care is taken to avoid fragmentation or damage, which can affect pathological interpretation.

2. Orientation

ESD Specimens: These are usually larger and en bloc, so orientation is critical. The specimen is stretched and pinned flat (mucosal side up) on a firm surface, often a corkboard or filter paper.

EMR Specimens: These are often piecemeal (in multiple pieces), so orientation may not be possible. Still, all fragments are collected and submitted.

3. Fixation

The tissue is fixed in 10% neutral buffered formalin, typically for 6–24 hours depending on size.

Proper fixation preserves tissue morphology and enables good sectioning for histology.

4. Labeling & Documentation

The specimen container is labeled with:

Patient identifiers

Site and type of procedure (e.g., "EMR, sigmoid colon")

Orientation indicators (e.g., inked margins if orientation is maintained)

A diagram or photo may accompany ESD specimens to aid pathologists.

5. Submission to Pathology

The specimen is sent to the pathology lab along with clinical notes, endoscopic findings, and any relevant diagrams or photographs.

Critical information includes:

Size of the lesion

Location in the GI tract

Indications for the procedure

Whether it was en bloc or piecemeal

6. Pathological Assessment

Pathologists assess:

Histologic type (e.g., adenoma, carcinoma)

Depth of invasion

Margin status

Lymphovascular invasion

Differentiation grade

Q12. What is the expected timeframe and method for accessing pathology results after an ESD/EMR procedure?

A12:

After an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) procedure, pathology results are typically available within 3 to 10 business days, depending on the healthcare facility's lab processing times and the complexity of the specimen analysis.

1.Expected Timeframe:

Standard turnaround: 3–7 business days

More complex cases (e.g., requiring immunohistochemistry or expert review): up to

10–14 business days

2. Method of Accessing Results:

Patient Portal:

Most hospitals and clinics provide results via a secure online portal (e.g., MyChart, Follow My Health). You'll receive a notification when results are posted.

Follow-Up Appointment:

Many physicians prefer to review the pathology results with the patient in person or via telehealth to discuss implications and next steps (e.g., need for additional treatment, surveillance schedule).

Phone Call or Secure Messaging:

In some cases, the gastroenterologist or surgeon may call or send a secure message with a summary of the findings.

3. What to Expect in the Pathology Report:

Diagnosis: e.g., adenoma, carcinoma, hyperplastic polyp

Margins: Whether the lesion was completely removed (R0 resection)

Invasion depth: Particularly important for malignant lesions

Lymphovascular invasion: Relevant for assessing metastasis risk

4. What You Can Do:

If you haven't heard back in 7–10 business days, it's appropriate to call your provider's office or check your patient portal.

Ensure a follow-up appointment is scheduled to discuss the results, especially if malignancy was a concern.

RA12:

After an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) procedure, pathology results are typically available within the following timeframe and method:

1.Expected Timeframe

Standard turnaround: 5 to 10 business days.

Faster results: Sometimes within 3-5 days, depending on the facility's lab processing time and urgency.

Delays can occur if:

The specimen is large and requires detailed sectioning.

Special staining or molecular studies are needed.

The case is complex and requires a second opinion or tumor board review.

2.Method of Access

Patient Portal (e.g., MyChart, Epic): Most hospitals post pathology results in the patient's electronic health record. You may receive an alert when results are ready.

Phone call or appointment with physician:

Your gastroenterologist or surgeon will typically call you or discuss results during a follow-up appointment.

If malignancy or unclear margins are found, they may coordinate care with oncology or surgery teams.

Printed copy: Available upon request, especially during follow-up visits.

3.Why the Wait?

The delay is due to:

Tissue fixation and processing

Microscopic examination by a pathologist

Staging/grading, especially if cancer is suspected or confirmed

If it's been more than 10 business days and you haven't heard anything, it's appropriate to contact your physician's office to check on the status.

Q13. Which terms in the pathology report after an ESD/EMR procedure should be given special attention?

A13:

Great question—certain key terms in a pathology report after an ESD (Endoscopic Submucosal Dissection) or EMR (Endoscopic Mucosal Resection) procedure are especially important, as they guide prognosis, need for further treatment, and surveillance strategy.

Here are the most important pathology terms to pay close attention to:

1. Diagnosis / Histologic Type

Examples:

Adenoma (tubular, tubulovillous, villous)

High-grade dysplasia

Intramucosal carcinoma

Invasive adenocarcinoma

Neuroendocrine tumor

Why it matters: Determines whether the lesion is benign, pre-cancerous, or malignant.

2. Resection Margins

Terms to look for:

Lateral margin: Clean vs. involved

Deep margin: Clean vs. involved

R0 resection: Complete removal (negative margins)

R1 resection: Incomplete removal (positive margins)

Rx: Indeterminate

Why it matters: Positive margins (especially deep) may indicate residual disease and a need for further treatment.

3. Depth of Invasion

Terms vary by organ:

Esophagus/stomach: Confined to mucosa vs. submucosa (e.g., SM1, SM2)

Colon: Intramucosal vs. submucosal invasion

Numeric depth (e.g., 800 μm into submucosa)

Why it matters: Invasion beyond the mucosa increases risk of lymph node metastasis.

4. Lymphovascular Invasion (LVI)

Reported as: Present or absent

Why it matters: Presence suggests higher risk of spread; may warrant surgery or closer follow-up.

5. Tumor Differentiation

Grades:

Well-differentiated

Moderately differentiated

Poorly differentiated

Why it matters: Poor differentiation is a high-risk feature associated with aggressive behavior.

6. Tumor Budding or Perineural Invasion (PNI)

(Occasionally reported in colorectal lesions)

Why it matters: Both are unfavorable prognostic features.

7. Ki-67 / Mitotic Index (for Neuroendocrine Tumors)

Why it matters: Indicates tumor growth rate; used for grading NETs.

Summary of High-Risk Features That Warrant Attention:

Positive or unclear margins (R1 or Rx)

Submucosal invasion (especially >1000 μm)

Lymphovascular invasion (LVI)

Poor differentiation

Tumor budding or perineural invasion (PNI)

Neuroendocrine tumor with high Ki-67 index.

RA13:

After an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR), a pathology report is critical for guiding further management. The following terms and findings should be given special attention:

1. Histological Type / Tumor Type

What to look for: Adenoma, adenocarcinoma, squamous cell carcinoma, neuroendocrine tumor, etc.

Why it matters: Determines malignant potential and further treatment decisions.

2. Differentiation Grade

Terms: Well-differentiated, moderately differentiated, poorly differentiated.

Why it matters: Poorly differentiated tumors are more aggressive and may warrant additional therapy.

3. Depth of Invasion

Terms: Mucosal (T1a), submucosal (T1b), and depth in microns if submucosal.

Why it matters:

Mucosal (T1a): Often curable with ESD/EMR alone.

Submucosal (T1b): Higher risk of lymph node metastasis → may require surgery.

4. Lymphovascular Invasion (LVI)

Terms: Present / Absent.

Why it matters: LVI is a strong predictor of lymph node metastasis and poor prognosis.

5. Margins (Lateral and Deep)

Terms: R0 (clear), R1 (involved), Rx (indeterminate).

Why it matters: Incomplete resection (R1 or Rx) may require re-treatment or surgery.

6. Tumor Size

Why it matters: Larger lesions are more likely to have submucosal invasion and metastasis.

7. Tumor Budding

Why it matters: High tumor budding is associated with more aggressive behavior and higher recurrence risk.

8. Resection Type

Terms: En bloc vs piecemeal.

Why it matters:

En bloc: Better for accurate histology and complete resection.

Piecemeal: May obscure margin status and increase recurrence risk.

9. Immunohistochemical Findings (if included)

Markers such as Ki-67, p53, CK20, or CDX2 may be used to further characterize the lesion.

Q14. What are the relevant definition standards and classifications for postoperative complications of ESD/EMR?

A14:

Endoscopic mucosal resection (EMR) and endoscopic submucosal dissection (ESD) are commonly used endoscopic surgical techniques for the treatment of early gastrointestinal tumors. Although these two surgeries are effective, they may also lead to some complications. Understanding the definition criteria and classification of these complications is crucial for prevention and management.

Complications are usually classified by time of occurrence (intraoperative, early postoperative, late postoperative) and severity. The following are some common definitions and classifications of postoperative complications:

1. Bleeding

Definition: Continuous or intermittent bleeding in the digestive tract after surgery may lead to acute anemia.

Classification:

Early postoperative bleeding usually refers to bleeding within 24 hours after surgery.

Late postoperative bleeding occurs 24 hours after surgery.

2. Perforation

Definition: Complete rupture of the digestive tract wall due to deep resection during or after surgery.

Classification:

Acute perforation: A perforation discovered during or immediately after surgery.

Delayed perforation: A perforation that gradually manifests within a few days after surgery.

3. Narrow

Definition: In a certain part of the digestive tract, narrowing of the lumen caused by postoperative scar contraction or excessive growth of granulation tissue.

Classification:

Early stenosis: Symptoms appear shortly after surgery.

Late stage stenosis: Symptoms appear several weeks to months after surgery.

4. Infection

Definition: Local or systemic infection caused by surgical site or perforation of the digestive tract after surgery.

Classification:

Local infections: Including postoperative wound infections, intra-abdominal infections, etc.

Systemic infection: Including sepsis or systemic infection reactions.

5. Recurrence

Definition: Tumor like lesions reappear at the site of surgical resection.

Classification:

Local recurrence: Tumor rediscovered within the original surgical area.

Remote recurrence: New tumors are found in other parts of the digestive tract or other tissues within the body.

Management strategy:

The management of postoperative complications often relies on timely diagnosis and appropriate intervention measures. For example, for bleeding and perforation, urgent endoscopic intervention or surgery may be required. For stenosis, endoscopic dilation

or stent placement may be necessary. Infection usually requires antibiotic treatment, while for tumor recurrence, further surgery or other treatment methods such as radiation or chemotherapy may be required.

In the decision-making process of performing ESD or EMR surgery, doctors usually evaluate the overall condition of the patient, the characteristics of the tumor, and the potential risk of complications to develop the most appropriate treatment plan.

RA14：

The definition criteria and classification of postoperative complications for endoscopic mucosal resection (EMR) and endoscopic mucosal dissection (ESD) are as follows:

Classified by severity

1. Mild complications:

The impact on patient health is relatively small and can usually be addressed through simple treatment measures.

Example: Mild bleeding, mild postoperative pain.

2. Moderate complications:

It may have a certain impact on the patient's rehabilitation process and may require additional treatment or extended hospital stay.

Example: Moderate amount of bleeding, requiring blood transfusion but not surgery, local infection.

3. Severe complications:

Having a significant impact on the patient's health may require surgery or other active treatment interventions.

Example: Severe bleeding requiring emergency surgery, gastrointestinal perforation.

Classify by type

1. Bleeding:

Definition: Intraoperative or postoperative bleeding caused by wound resection or submucosal vascular injury.

Classification:

Intraoperative bleeding occurs during the surgical process.

Early postoperative bleeding: Bleeding that occurs within 24 hours after surgery.

Late postoperative bleeding: Bleeding that occurs 24 hours after surgery.

2. Perforation:

Definition: Penetration of the digestive tract wall during or after surgery due to injury or resection.

Classification:

Intraoperative perforation: Directly detected and immediately treated during the surgical process.

Delayed perforation: Gradually manifests within hours to days after surgery.

3. Narrow:

Definition: Narrowing of the digestive tract lumen due to postoperative scar or tissue healing.

Classification:

Early stenosis: Symptoms appear shortly after surgery.

Late stage stenosis: Symptoms appear several weeks to months after surgery.

4. Infection:

Definition: Bacterial or systemic infection of digestive tract tissue caused by surgery.

Classification:

Local infection: Infection limited to the surgical area or adjacent areas, such as peritonitis.

Systemic infection: It may include sepsis or systemic infection reactions.

5. Recurrence:

Definition: Tumor lesions reappear in the original lesion area after surgery.

Classification:

Local recurrence: New lesions appear at the original surgical site.

Distant recurrence: New lesions are found in other digestive tract or organ tissues.

These complications should be discussed in detail with the patient before surgery to ensure that they are informed and make arrangements for postoperative follow-up.

Q15. What are the common postoperative complications and related treatments of ESD/EMR?

A15：

ESD (endoscopic mucosal dissection) and EMR (endoscopic mucosal resection) are

two commonly used endoscopic surgical techniques for the treatment of early gastrointestinal tumors and lesions. Although they are relatively safe, postoperative complications may still occur. Common postoperative complications and their management methods include:

1. Bleeding:

Symptoms: Vomiting blood, rectal bleeding, or decreased hemoglobin.

Treatment: Using endoscopic hemostasis techniques, such as injection of hemostatic agents, electrocoagulation hemostasis, clip hemostasis, etc. In severe cases, blood transfusion or surgical hemostasis may be necessary.

2. Perforation:

Symptoms: Abdominal pain, fever, bloating, or visible pneumoperitoneum.

Treatment: Perforation can be closed under endoscopy by placing a clamp or covered stent. Most perforations can be treated conservatively, but in severe cases, surgical repair may be necessary.

3. Narrow:

Symptoms: Difficulty swallowing or food retention.

Treatment: Relieve stenosis through endoscopic dilation or the use of stents. Severe stenosis may require multiple expansions for treatment.

4. Infection:

Symptoms: Fever, abdominal pain, diarrhea, may be accompanied by changes in physical signs.

Treatment: Depending on the location and type of infection, using antibiotics for

treatment, and if necessary, drain the abscess or other fluid accumulation.

5. Anesthetic reactions:

Symptoms: Dizziness, nausea, vomiting, or more serious cardiovascular or respiratory system problems.

Treatment: Keeping the patient's vital signs stable, and if necessary, applying medication or further rescue measures.

After surgery, the patient's symptoms and signs should be closely observed, and any possible complications should be detected and treated as soon as possible. In addition, providing patients with sufficient rest and nutritional supplementation after surgery can also help improve recovery speed and reduce the occurrence of complications.

RA15：

ESD (endoscopic submucosal dissection) and EMR (endoscopic mucosal resection) are both endoscopic techniques used for the treatment of early gastrointestinal tumors and lesions. Although the results are usually good, there may still be some postoperative complications. Common complications and corresponding treatment methods include:

1. Bleeding:

Symptoms: May manifest as vomiting blood, black stools, or significant decrease in hemoglobin.

Treatment: If bleeding occurs during or after surgery, it is usually stopped through techniques such as endoscopic injection of hemostatic agents, electrocoagulation, and

clips. If endoscopy cannot control it, surgical intervention may be necessary. For mild bleeding, hemostatic agents or close observation can be used.

2. Perforation:

Symptoms: It may cause abdominal pain, bloating, and even symptoms of peritonitis.

Treatment: Perforation under endoscopy can be closed with a metal clip or covered with a stent. If endoscopic treatment is not possible, surgical intervention may be required.

3. Narrow:

Symptoms: Dysphagia or intestinal obstruction caused by scar tissue formation.

Treatment: Mild stenosis can be treated with endoscopic dilation, while severe cases may require stent placement or multiple dilation treatments.

4. Infection:

Symptoms manifested as fever, abdominal pain, and may be accompanied by abdominal abscess or other signs of infection.

Treatment: Using antibiotics for treatment and perform drainage if necessary.

5. Anesthesia complications:

Symptoms: Dizziness, nausea, vomiting, and in severe cases, cardiovascular or respiratory system problems may occur.

Treatment: Maintaining the stability of the patient's vital signs, and using symptomatic treatment and support measures if necessary.

Postoperative monitoring and management are very important as they can help detect complications early and treat them promptly, reduce patient pain, and improve

prognosis.

Q16. What are the influencing factors of postoperative complications in ESD/EMR?

A16:

The postoperative complications of ESD (endoscopic submucosal dissection) and EMR (endoscopic mucosal resection) may be influenced by various factors, which can be divided into patient characteristics, surgical factors, and disease-related factors:

1. Patient characteristics:

Age: Older individuals may be more prone to complications.

Associated diseases: Chronic diseases such as hypertension, diabetes, heart disease, liver and kidney dysfunction will increase the risk of complications.

Abnormal coagulation function: Patients with coagulation dysfunction have an increased risk of bleeding.

Drug use: Long term use of anticoagulants and antiplatelet drugs may increase the risk of bleeding.

2. Surgical factors:

Surgical duration: Prolonged surgery may increase the risk of bleeding or perforation.

Surgical difficulty: Areas with deep or large lesions and difficulty in operation (such as the fundus of the stomach, intestinal angle, etc.) increase the likelihood of

complications.

Surgical technique: The experience and technical level of the surgeon can affect the incidence of complications.

3. Factors related to lesions:

Size and shape: Larger lesions may require more extensive resection, increasing the risk of perforation and bleeding.

Location: The lesion is located in difficult to operate locations such as the fundus of the stomach and duodenum, which increases the complexity of the surgery and the risk of complications.

Nature: If the lesion is deeper or invades the submucosal layer, the risk of perforation is higher.

Taking these factors into consideration, preoperative patient evaluation and surgical selection, strict adherence to operating standards during surgery, and close monitoring of complications after surgery can effectively reduce the incidence of complications.

RA16:

The incidence of complications after endoscopic submucosal dissection (ESD) and endoscopic mucosal resection (EMR) is influenced by multiple factors. These factors typically include the patient's physical condition, the technical complexity of the surgery itself, and the nature of the lesion. The main influencing factors are as follows:

1. Patient related factors:

Age: Older patients often suffer from chronic diseases, decreased physical function, and may increase the risk of postoperative complications.

Concomitant diseases: Chronic diseases such as cardiovascular disease, diabetes, liver and kidney dysfunction will reduce the recovery ability of the body and increase the risk of infection and bleeding.

Anticoagulant drugs: Patients who take anticoagulant or antiplatelet drugs for a long time have a higher risk of bleeding.

2. Surgical related factors:

Surgical site: Some areas are more difficult to operate or fragile, such as the fundus of the stomach, esophagus, duodenum, etc., which are prone to perforation or bleeding.

Surgical time: Prolonged operation time can increase the risk of tissue edema, bleeding, and infection.

Surgical experience: The experience and skills of the surgeon have a significant impact on the occurrence of complications, and proficient operation can reduce the risk of postoperative complications.

3. Factors related to lesions:

Size and location: Lesions that are extensive or located in specific locations (such as intestinal corners or bends in the digestive tract) make surgery more difficult and increase the risk of perforation and bleeding.

Nature: Deep infiltrating lesions or fibrotic lesions may be more difficult to

completely remove and have a higher risk of perforation.

Multiple lesions: Multiple lesions require a wider resection range, increasing surgical complexity and the possibility of complications.

4. Postoperative management:

Postoperative monitoring: Close monitoring of the patient's postoperative vital signs and symptoms, especially bleeding and perforation symptoms, can detect complications in a timely manner and handle them quickly.

Nutrition and resuscitation: Providing appropriate postoperative nutritional support and resuscitation treatment for patients to avoid postoperative infections and other complications.

Taking these factors into consideration, in preoperative evaluation and planning, potential risks should be identified as much as possible and preventive measures should be taken to reduce the incidence of complications.

Q17. What are the observation indicators for the therapeutic effect of ESD/EMR?

A17:

The evaluation of the therapeutic effects of ESD (endoscopic submucosal dissection) and EMR (endoscopic mucosal resection) typically involves multiple clinical indicators. Here are some common observation indicators:

1. Complete resection rate:

Definition: Whether complete resection of diseased tissue has been achieved, including whether there is no tumor residue at the horizontal and vertical margins.

Objective: The absence of tumor cells at the edge of lesion resection indicates that the surgery has achieved a curative effect.

2. Bleeding:

Definition: The frequency and severity of intraoperative and postoperative bleeding.

Objective: To reduce or avoid bleeding, timely stop bleeding, and ensure stable postoperative vital signs of patients.

3. Perforation:

Definition: Gastrointestinal perforation caused by operation during or after surgery.

Goal: Minimizing perforation as much as possible, promptly addressing perforation upon detection, and avoiding severe infection.

4. Recurrence rate:

Definition: Whether the lesion reappears or expands during follow-up.

Goal: No residual lesions, long-term follow-up to ensure no recurrence.

5. Narrow:

Definition: Digestive tract stenosis caused by scar tissue after surgery, which affects normal swallowing or excretion.

Objective: To minimize the risk of stenosis, especially in high-risk areas such as the esophagus, pylorus, or duodenum.

6. Survival rate:

Definition: Long term survival rate of patients after surgery, including 5-year recurrence free survival rate, etc.

Objective: To improve the long-term quality of life and survival time of patients.

7. Postoperative recovery:

Definition: The recovery time of the patient after surgery, whether there are other complications such as infection or pain.

Objective: Rapid postoperative recovery without significant complications.

Through these indicators, clinical doctors can evaluate the efficacy of ESD and EMR, optimize treatment plans, and improve patient prognosis and quality of life.

RA17：

When evaluating the therapeutic effects of ESD (endoscopic submucosal dissection) and EMR (endoscopic mucosal resection), the following key observation indicators are usually considered:

1. Complete resection rate:

Definition: Whether the target lesion tissue is completely removed.

Standard: Pathological report shows no residual cancer cells at the cutting edge (R0 resection).

2. Bleeding:

Definition: The incidence and severity of intraoperative or postoperative bleeding.

Evaluation: Monitor for postoperative vomiting or rectal bleeding, or using endoscopy for further evaluation.

3. Perforation:

Definition: Rupture of the digestive tract wall during or after surgery, resulting in leakage from the abdominal or thoracic cavity.

Assessment: Intraoperative endoscopic or postoperative monitoring of abdominal symptoms, imaging examinations (X-rays, CT, etc) .

4. Recurrence rate:

Definition: Whether the lesion relapses during the follow-up period after resection.

Evaluation: Regularly evaluating the recurrence of lesions during the follow-up period through endoscopy or other examinations.

5. Narrow:

Definition: Digestive tract stenosis caused by scar tissue after surgery, which affects the normal passage of food or fluid.

Evaluation: Observing the patient's symptoms, such as difficulty swallowing, abdominal pain or nausea, or evaluating the location and severity of stenosis through endoscopy.

6. Postoperative recovery:

Definition: The time for postoperative recovery of patients and any complications that may occur.

Assessment: Observing the patient's eating, bowel movements, pain levels, and length of hospital stay.

7. Long term survival rate:

Definition: Long term survival of patients after surgery, including overall survival

rate and disease-free survival rate.

Assessment: Following up the patient's survival status and recording any relapses or new lesions.

These indicators provide comprehensive information for evaluating the therapeutic effects of ESD and EMR, helping doctors make better decisions and optimize treatment plans.

Q18. What postoperative symptoms are considered normal after an ESD/EMR procedure?

A18:

After an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) — both minimally invasive procedures used to remove gastrointestinal lesions such as early cancers or large polyps—certain postoperative symptoms are considered normal, while others may signal complications.

1. Normal postoperative symptoms:

Mild abdominal discomfort or bloating

Due to air insufflation during the procedure.

Should resolve within a few hours to a day.

Sore throat (if the procedure was upper GI, like in the esophagus or stomach)

Caused by passage of the endoscope.

Mild nausea or fatigue

Common after sedation/anesthesia.

Minimal bleeding (e.g., in stool)

Slight traces of blood in stool can occur for a few days.

More common after EMR than ESD.

Decreased appetite or light diet tolerance

Especially after gastric or esophageal procedures.

Fever < 38°C (100.4°F)

A low-grade fever may occur in the first 24 hours.

2. Symptoms to watch for (may indicate complications):

Severe or worsening abdominal pain

Could signal perforation or infection.

High fever (> 38°C / 100.4°F) or persistent fever after 24 hours

Significant or persistent rectal bleeding

Especially if it causes weakness or dizziness.

Black, tarry stools or vomiting blood

Signs of upper GI bleeding.

Nausea, vomiting, or inability to keep fluids down

Signs of infection

Chills, increased heart rate, confusion.

General recovery timeline:

Hospital stay: May be same-day or 1–2 nights depending on extent and location.

Return to normal activity: Within a few days, but strenuous activity is usually avoided for a week.

Diet: Progression from liquids to soft solids depending on healing.

Always follow your doctor's specific postoperative instructions. If you're unsure about a symptom, it's safest to contact your medical provider promptly.

RA18:

After an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR)—both used to remove superficial lesions in the gastrointestinal (GI) tract—several postoperative symptoms are considered normal and expected as part of the healing process. However, distinguishing normal symptoms from complications is important. Here's a breakdown:

1.Normal Postoperative Symptoms

Mild Abdominal Discomfort or Cramping

Especially after esophageal or gastric procedures.

Usually due to air insufflation during the procedure.

Mild Throat Soreness

From endoscope passage.

Resolves in 1–2 days.

Bloating or Fullness

From residual air in the GI tract.

Can last up to 24–48 hours.

Mild Nausea or Low Appetite

Due to anesthesia, sedation, or temporary mucosal irritation.

Minimal Bleeding

Small amounts of dark or old blood in stools or during the first bowel movement may be seen.

Especially common after EMR/ESD in the colon or stomach.

Fever < 38°C (100.4°F)

Brief low-grade fever may occur post-procedure and resolve within 24 hours.

2.Concerning or Abnormal Symptoms

These require prompt medical attention:

Severe or Persistent Abdominal Pain

→ May indicate perforation or infection.

Bright Red Blood in Vomit or Stools

→ Could indicate active bleeding.

Fever > 38°C (100.4°F) lasting more than 24 hours

→ May suggest infection or perforation.

Black, Tarry Stools (Melena)

→ Possible GI bleeding.

Difficulty Swallowing or Severe Chest Pain

→ May signal esophageal injury.

Dizziness, Fainting, or Rapid Heart Rate

→ Could indicate significant blood loss.

3. General Advice Post-ESD/EMR

Diet: Usually starts with liquids and progresses to soft foods. Follow your physicians instructions.

Activity: Light activity; avoid heavy lifting for a few days.

Medications: PPIs or antacids often prescribed post-ESD to promote healing.

Follow-Up: Important for pathology results and to monitor for recurrence or complications.

Q19. Do patients need family accompaniment after an ESD/EMR procedure, and for how long is it recommended?

A19:

Patients typically do need family or caregiver accompaniment after Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR), especially on the day of the procedure, and sometimes beyond that depending on individual recovery and risks.

Reasons for accompaniment:

1. Sedation recovery: ESD/EMR is usually performed under conscious sedation or general anesthesia. Patients are not allowed to drive or make critical decisions for at least 24 hours.

2. Monitoring for complications: There's a risk of bleeding, perforation, or infection

within the first 24–72 hours post-procedure. Family presence can help monitor for signs of distress.

3. Support with activities: Patients may feel weak, drowsy, or in pain, and need help with mobility, meals, and medications.

Recommended Duration of Accompaniment:

1.First 24 hours: Mandatory accompaniment by a responsible adult

2.Next 2–3 days: Recommended support, especially if the resection was extensive or if the patient is elderly or lives alone

3.After 3 days: Usually safe to be alone if there are no complications and recovery is on track

Special Considerations:

1. Elderly or frail patients may need longer assistance.

2. Large resections or those in the esophagus or colon can have a higher risk of delayed bleeding or perforation.

3. If the patient lives far from medical care, closer monitoring is advised for a longer duration.

RA19:

Patients typically need family or caregiver accompaniment after undergoing Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR), primarily due to:

1. Sedation Recovery

These procedures are usually done under conscious sedation or occasionally general anesthesia.

After sedation, patients can experience drowsiness, impaired judgment, and coordination for several hours.

Recommendation:

A responsible adult should accompany the patient home and stay with them for at least 12–24 hours, depending on the depth of sedation and institutional guidelines.

2. Risk of Post-Procedure Complications

Even though ESD/EMR is minimally invasive, there is a risk of:

Bleeding

Perforation

Delayed bleeding (especially in gastric or colonic lesions)

Recommendation:

The patient should be monitored at home for signs such as severe abdominal pain, vomiting, fever, or rectal bleeding.

Having someone nearby during the first 24 hours is strongly recommended in case urgent medical attention is needed.

3. Practical Considerations

Patients are generally not allowed to drive or make important decisions for at least 24 hours after sedation.

They may need help with meals, medication management, and mobility during the recovery period.

Summary:

Yes, accompaniment is necessary.

A family member or caregiver should:

Take the patient home after the procedure.

Stay with them for 12–24 hours to monitor for complications and assist with recovery.

Always follow the specific discharge instructions from the treating medical team.

Q20. What are the postoperative care precautions for ESD/EMR?

A20:

The key to postoperative care for ESD (endoscopic submucosal dissection) and EMR (endoscopic mucosal resection) is to prevent complications and promote patient recovery. The main precautions include:

1. Monitoring complications:

Bleeding: Monitoring symptoms of vomiting blood and rectal bleeding, and if present, immediately reporting to medical staff.

Perforation: Observing abdominal pain, fever, nausea, or other abnormal symptoms.

Infection: Paying attention to the patient's body temperature and white blood cell count, and if necessary, taking antibiotics to prevent or treat infection.

2. Dietary management:

Initial fasting: Short term fasting may be required after surgery, gradually returning

to a clear fluid diet depending on the situation, and then gradually transitioning to a soft and regular diet.

Reasonable diet: Avoid stimulating and spicy foods to prevent adverse irritation to the digestive tract.

3. Drug management:

Antibiotics: Using antibiotics according to medical advice to prevent or treat infections.

Painkillers: If necessary, using painkillers to control postoperative pain.

Acid suppressants: Using proton pump inhibitors or H2 receptor antagonists to reduce gastric acid secretion and protect the gastric mucosa.

4. Position and activity:

Appropriate activity: Encouraging appropriate activity early after surgery to prevent thrombosis and intestinal dysfunction, but avoiding vigorous activity.

Position: Maintaining a comfortable position and reducing pressure on the surgical area.

5. Psychological support:

Communication and Support: Providing psychological support and effective communication to alleviate patient anxiety about the disease.

Education: Informing patients of postoperative precautions and emphasizing the importance of follow-up.

6. Follow up examination:

Regular follow-up: Conducting endoscopic examinations according to medical

advice to monitor the recovery and recurrence of the affected area.

Evaluate long-term recovery: Monitoring the overall recovery status of the patient, including nutritional status, gastrointestinal function, etc.

Through these nursing measures, patients can effectively overcome the postoperative recovery period and ensure timely treatment of potential complications.

RA20:

The main goal of postoperative care for ESD (endoscopic submucosal dissection) and EMR (endoscopic mucosal resection) is to prevent complications and promote patient recovery. Here are some important nursing precautions:

1. Complication monitoring:

Bleeding: closely monitoring symptoms of vomiting blood, rectal bleeding, and anemia. If these symptoms occur, immediately notifying the doctor and assessing the severity.

Perforation: Bewaring of symptoms such as abdominal pain, bloating, and fever that may indicate perforation. If perforation is suspected, imaging or endoscopic examination should be performed.

Infection: Regularly checking the patient's body temperature and white blood cell count to identify and prevent postoperative infections.

2. Dietary management:

Initial fasting: After surgery, it is usually necessary to fast for a period of time to promote the healing of the surgical wound.

Gradual eating: Start with a light liquid diet, gradually transition to soft foods, and then return to a regular diet, avoiding spicy or irritating foods.

3. Drug management:

Acid suppressants: Proton pump inhibitors or H2 receptor antagonists can reduce gastric acid secretion and protect postoperative wounds.

Painkillers: Using painkillers as needed to avoid severe pain.

Antibiotics: If there is a risk of infection or symptoms of infection have appeared, follow medical advice to use antibiotics.

4. Position and activity:

Position: Maintaining a comfortable position early after surgery, avoiding intense abdominal movements, and preventing pressure on the wound.

Activity: Moderate postoperative activity can prevent thrombosis and promote intestinal function recovery, but vigorous exercise should be avoided.

5. Psychological support:

Communication and education: Providing psychological support to alleviate patient anxiety about surgery and recovery.

Disease notification: To inform patients of postoperative precautions and warning signals for complications, in order to help them detect and report problems as soon as possible.

6. Follow up and follow-up:

Endoscopic reexamination: According to the doctor's recommended schedule, regular endoscopic reexamination is conducted to monitor the healing status and

recurrence of the surgical area.

Comprehensive evaluation: Evaluate the overall rehabilitation status of the patient to ensure their comprehensive recovery in nutrition, psychology, and physical function. These nursing measures are crucial for preventing complications and ensuring smooth postoperative recovery for patients.

Q21. What are the application and precautions of drugs and food after ESD/EMR surgery?

A21:

After ESD (endoscopic submucosal dissection) and EMR (endoscopic mucosal resection), rational use of medication and dietary adjustment are important aspects of postoperative care, which can help promote healing and prevent complications. The following are relevant medication and dietary management recommendations:

1. Drug application

Acid suppressants:

Proton pump inhibitors (PPIs) or H2 receptor antagonists are used to reduce gastric acid secretion, prevent gastric acid from stimulating the wound, and promote healing. Usually, a period of continuous use is required after surgery, and the dosage and course of treatment should be adjusted according to the doctor's advice.

Antibiotics:

Short term use of antibiotics can prevent or treat infections when there is a risk of infection or suspicion of infection.

Using according to medical advice and complete the course of treatment.

Painkillers:

According to the patient's degree of pain, using non steroidal anti-inflammatory drugs or other painkillers to alleviate postoperative pain.

Avoiding excessive reliance on painkillers and preventing side effects.

Other:

If patients have chronic diseases (such as diabetes and hypertension), they should continue to use relevant drugs according to the doctor's recommendations.

2. Dietary management

Fasting stage:

On the day of surgery, fasting is usually required to reduce irritation to the surgical area.

Liquid diet:

1-2 days after surgery, patients can start consuming a small amount of clear liquid diet, such as clear soup, fruit juice, etc.

Semi liquid diet:

As the function of the digestive tract gradually recovers, you can turn to a semi liquid diet, such as rice porridge, steamed eggs, custard, etc.

Soft food and regular diet:

After stable wound healing, gradually returning to a soft diet and then switching to a

regular diet.

Trying to choose mild and non-irritating foods, and avoiding foods that are too hot, too cold, spicy, coarse fiber, or fried.

Dietary habits:

Eating small meals multiple times and avoiding overeating at once.

Chewing food thoroughly to prevent direct mechanical irritation to the surgical site.

Through reasonable medication and dietary adjustments, patients can better recover from postoperative conditions, reduce discomfort, and lower the risk of complications.

RA21:

After ESD (endoscopic submucosal dissection) and EMR (endoscopic mucosal resection), the correct use of medication and a reasonable diet arrangement can help to heal the surgical site and prevent complications. The specific suggestions are as follows:

1. Drug application

Acid suppressants:

Proton pump inhibitors (PPIs) or H2 receptor antagonists are used to reduce gastric acid secretion, avoid the stimulation of gastric acid on surgical wounds, and promote healing. Usually, after surgery, it is necessary to use it according to the course of treatment for a period of time to ensure that the surgical site is fully healed.

Painkillers:

Using appropriate painkillers based on the patient's level of pain. Non steroidal anti-inflammatory drugs (NSAIDs) or acetaminophen can be used to alleviate postoperative pain.

Antibiotics:

If there is a risk of infection or signs of infection (such as fever, pus exudation, etc.), it is necessary to follow medical advice to use antibiotics for prevention or treatment. The decision to use it is usually based on postoperative pathological assessment and infection risk.

Anticoagulant drugs:

If the patient has cardiovascular disease or other conditions that require long-term use of anticoagulant or antiplatelet drugs, postoperative adjustments or continued use should be made according to medical advice to avoid postoperative bleeding complications.

2. Dietary management

Postoperative fasting:

On the day of surgery, fasting is usually required to reduce mechanical stimulation of the gastrointestinal tract on the surgical site.

Liquid diet:

The first few days after surgery should focus on a clear liquid diet, such as clear soup, fruit juice, light tea, etc. Eating frequently in small bites and avoiding consuming large amounts of liquid at once.

Semi liquid diet:

As the healing of the surgical site progresses, it can gradually transition to a semi liquid diet, such as porridge, steamed eggs, etc. It is still necessary to avoid foods that are too hot, too cold, spicy, and coarse fiber.

Soft food and regular diet:

After wound healing, it can gradually return to a soft and regular diet. Focus on mild and light foods, and avoid stimulating foods.

Following the principle of small meals, chewing thoroughly, and reducing mechanical irritation to the surgical area.

Dietary habits:

Trying to avoid habits such as smoking and drinking that may affect healing.

Reasonable medication and dietary use can promote healing and reduce the risk of complications, while improving postoperative comfort and quality of life for patients.

Q22. What are the daily life precautions for postoperative ESD/EMR?

A22：

After undergoing ESD (endoscopic submucosal dissection) or EMR (endoscopic mucosal resection), patients need to make some adjustments in their daily lives to ensure wound healing and reduce the risk of complications. The main precautions for postoperative daily life include:

1. Dietary management

Step by step: Following the doctor's advice, gradually transition from a clear liquid diet to a semi liquid and soft diet, and finally returning to a normal diet.

Avoiding stimulating foods: Doing not eat spicy, greasy, overheated or too cold foods, and try to choose mild and easily digestible foods.

Small and multiple meals: Avoiding eating too much at once to avoid excessive stimulation of the surgical site.

2. Activities and Rest

Moderate rest: Adequate rest is required in the early postoperative period, but prolonged bed rest should be avoided to prevent muscle atrophy and thrombosis.

Mild activity: After surgery, appropriate activities such as walking should be performed to maintain physical strength, but vigorous exercise or heavy physical labor should be avoided, especially to prevent high abdominal pressure from causing damage to the surgical site wound.

Position: Avoiding a position where pressure is placed on the surgical site of the digestive tract, such as excessively bending or squatting.

3. Drug management

Follow medical advice: Using antibiotics, acid suppressants, painkillers, or other necessary medications according to the doctor's instructions.

Paying attention to side effects: Paying attention to possible side effects of drugs, such as the intestinal reactions of antibiotics and the bone health effects of acid suppressants, and contacting a doctor in a timely manner if necessary.

4. Psychological adjustment

Relieve anxiety: During the postoperative recovery period, patients may worry about recurrence or discomfort symptoms. Appropriate psychological support and communication with doctors can alleviate anxiety.

Active participation: Maintaining an optimistic attitude, follow the doctor's follow-up plan, and actively cooperate with rehabilitation.

5. Regular follow-up

Endoscopic examination: Following the doctor's advice, performing regular endoscopic examinations to monitor the healing of the surgical area and promptly detect any signs of recurrence.

Comprehensive examination: Monitoring the overall condition of the patient after surgery, such as anemia, malnutrition, etc., to ensure comprehensive recovery.

Through these adjustments in daily life, patients can better cope with the recovery period after surgery and gradually return to a normal state of life.

RA22：

Endoscopic mucosal dissection (ESD) and endoscopic mucosal resection (EMR) are minimally invasive surgeries for the treatment of early gastrointestinal cancer or polyps. After surgery, to ensure smooth recovery and reduce the risk of complications, it is recommended that you follow the following precautions:

1. Dietary control: In the first few days after surgery, following the doctor's advice and gradually transition from liquid or soft food to solid food. Avoiding spicy, irritating, or greasy foods to prevent gastrointestinal discomfort.

2. Drug management: Strictly following the doctor's instructions to take antibiotics, stomach acid inhibitors, or other medications. If there are any discomfort or side effects, please contact a doctor in a timely manner.

3. Physical activity: After surgery, vigorous activities such as weightlifting, running, or bending should be avoided to prevent bleeding or wound tearing. It is recommended to engage in light activities, such as walking, but gradually increasing the amount of activity.

4. Observing symptoms: Paying close attention to abnormal symptoms such as abdominal pain, fever, vomiting, black stools, or bloody stools. If these symptoms occur, you should immediately contact a doctor.

5. Regular follow-up: Following up on time according to the doctor's requirements to monitor recovery and identify potential problems in a timely manner.

6. Maintaining a positive mindset, taking appropriate rest, and actively cooperating with the doctor's guidance during the recovery period.

By following these precautions, you will help ensure a smooth postoperative recovery. If you have any other specific situations or concerns, be sure to communicate with your medical team.

Q23. How soon after an ESD/EMR procedure can a patient return to work, engage in physical activity, or take a shower?

A23:

The recovery timeline after an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) procedure depends on the individual case (e.g., size and location of the lesion, patient's overall health, and any complications). However, general guidelines are as follows:

1.Return to Work

Typical timeframe: 3–7 days after the procedure.

Considerations:

Light office work may be resumed earlier (after ~3 days) if no complications.

For physically demanding jobs, a longer rest period (~1 week or more) is advisable.

Your doctor will tailor advice based on bleeding risk and sedation recovery.

2. Physical Activity

Light activity (e.g., walking): 24–48 hours post-procedure if no bleeding or pain.

Strenuous activity/heavy lifting: Avoid for 7–14 days.

Why: Strenuous activity can increase the risk of delayed bleeding from the resection site.

3. Showering

Usually permitted: Same day or next day, unless advised otherwise due to sedation or other medical concerns.

Note: If you've had general anesthesia or sedation, avoid hot showers for 24 hours due to the risk of dizziness/fainting.

4. Additional Precautions

Watch for signs of complications: abdominal pain, vomiting, fever, or rectal bleeding.

Diet: Often a soft or liquid diet is recommended for 1–2 days post-procedure.

Always follow the specific post-procedure instructions from your gastroenterologist, as recommendations can vary significantly depending on whether the lesion was in the esophagus, stomach, or colon, and whether there were any complications like perforation or bleeding.

RA23:

Recovery timelines after Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) vary depending on factors like the size and location of the lesion, the patient's overall health, and whether complications occurred. However, general guidelines are as follows:

1.Returning to Work

Office/Desk Job: Usually within 3 – 5 days after the procedure, assuming no complications.

Physically Demanding Job: May require 1–2 weeks off to prevent strain that could cause bleeding or perforation.

2.Physical Activity

Light Activity (e.g., walking): Often allowed after 2–3 days.

Moderate Activity (e.g., light exercise): Typically resumed after 1 week, pending physician approval.

Strenuous Exercise or Heavy Lifting: Should be avoided for at least 10–14 days, sometimes longer depending on lesion size and location.

3.Showering

Usually permitted within 24 hours after the procedure**, unless sedative effects linger. Patients should avoid very hot water or prolonged standing in case of dizziness post-sedation.

4.Important Considerations:

Bleeding risk is the primary concern after ESD/EMR. Most bleeding events happen within the first 5–7 days.

Follow-up endoscopy may be scheduled to ensure healing and check for recurrence.

Diet: Usually restricted to liquids or soft foods for 1–2 days, then gradually advanced.

Always follow your doctor's specific instructions, especially if the procedure involved a high-risk lesion or complications.

Q24. What are the follow-up appointments and response methods for postoperative adverse events in ESD/EMR?

A24：

Postoperative follow-up and response to potential adverse events are crucial steps in the postoperative rehabilitation process of ESD/EMR. The following are relevant suggestions:

1. Follow up appointment

Time arrangement: The first follow-up examination is usually required within 1 to 2

weeks after surgery. Afterwards, the doctor will determine the frequency of follow-up based on your recovery and condition.

Follow up content: During the follow-up process, doctors may perform endoscopic examination, imaging examination, pathological examination, or blood test to evaluate recovery and determine whether there are residual lesions or relapses.

Record symptoms: During follow-up, you should inform the doctor of your recent physical condition, including any discomfort, pain, bleeding, or abnormal symptoms.

2. Response to postoperative adverse events

Bleeding:

Mild bleeding may occur within a few days after surgery and may manifest as blood in the stool or black stools.

If there is excessive bleeding accompanied by severe abdominal pain or anemia symptoms, one should immediately contact a doctor or go to the emergency department.

Perforation:

The risk of postoperative gastrointestinal perforation is relatively low, but if there is severe abdominal pain, fever, or bloody stools, medical attention should be sought as soon as possible.

Infection:

Antibiotics are usually used to prevent infection, but if fever, chills, abdominal pain, or other symptoms of infection occur, it is important to seek medical attention as soon as possible.

Narrow:

Certain parts (such as esophageal or intestinal strictures) may cause difficulty swallowing or defecation. If these symptoms occur, doctors may recommend expansion therapy or other interventions.

Other discomforts:

If you feel nausea, vomiting, indigestion, or other discomfort, communicating with a doctor in a timely manner. It may be necessary to adjust diet or medication.

The above measures can help you recover better after surgery and detect and handle potential adverse events as early as possible. Maintaining active communication with the medical team, closely monitoring one's own symptoms, and following the doctor's advice will help with a smooth recovery.

RA24：

Follow up and management of adverse events are crucial for recovery after endoscopic mucosal dissection (ESD) and endoscopic mucosal resection (EMR). The following are detailed guidance and suggestions:

Follow up appointment

First follow-up: A first follow-up examination is usually required within 1 to 2 weeks after surgery. The doctor will arrange further follow-up plans based on your recovery situation.

Follow up: Usually, follow-up is required within 3 to 6 months to ensure no recurrence or residual lesions. Subsequently, regular examinations may be conducted

annually, especially for high-risk patients.

Examination content: Doctors will conduct endoscopic, imaging, or pathological examinations during follow-up to confirm recovery status and identify any potential issues.

Information provided: During the follow-up period, providing a detailed description of possible postoperative symptoms to the doctor, such as abdominal pain, indigestion, black stools, or bleeding, to help the doctor accurately assess the recovery situation.

Response methods for postoperative adverse events

Bleeding:

Mild bleeding: A small amount of bleeding may occur within a few days after surgery, which may manifest as blood in the stool or black stools, but without significant pain.

Severe bleeding: If there is a large amount of bloody stool or vomiting blood accompanied by severe abdominal pain, one should immediately contact a doctor or go to the emergency department.

Perforation:

If there are severe abdominal pain, fever, or infection symptoms (such as pus and bloody stools) after surgery, it may indicate gastrointestinal perforation and require urgent medical attention.

Narrow:

Certain parts (such as the esophagus, stomach, and colon) may experience narrowing, leading to difficulty swallowing or defecation. If such symptoms occur, doctors may

suggest expanding treatment or other intervention measures.

Infection:

If you experience symptoms of infection such as fever, chills, or severe abdominal pain, you should contact a doctor as soon as possible or go to the emergency department.

Other discomforts:

If you experience symptoms such as nausea, vomiting, or persistent abdominal pain, report to a doctor in a timely manner. It may be necessary to adjust diet or medication.

These follow-up and response measures can help ensure smooth postoperative recovery and early detection of potential problems. Maintaining communication with the doctor is very important, please strictly follow the doctor's advice and follow-up plan.

Q25. What is the likelihood of recurrence after an ESD/EMR procedure, and what are the related influencing factors?

A25:

The likelihood of recurrence after an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) depends on multiple factors, including lesion type, completeness of resection, and patient-specific factors. Here's a breakdown:

Recurrence Rates

EMR

Recurrence rate: 5%–30% (higher for piecemeal resection)

Most common in colorectal lesions, particularly large laterally spreading tumors (LSTs)

ESD

Recurrence rate: <2% (when en bloc resection is achieved)

Considered superior to EMR for en bloc resection of large or high-risk lesions

Factors Influencing Recurrence

1. Technique-Related

En bloc vs. piecemeal resection:

En bloc resection drastically reduces recurrence

Piecemeal EMR has a much higher recurrence rate (~15–30%)

Resection margins:

Positive or indeterminate margins (R1 or Rx) increase recurrence risk

Use of adjunctive ablation (e.g., APC for EMR): may reduce local recurrence after piecemeal resection

2. Lesion Characteristics

Size: Larger lesions (especially >20 mm) have higher recurrence rates

Histology:

High-grade dysplasia or submucosal invasion increases risk

Poorly differentiated tumors carry higher risk

Morphology:

Laterally spreading tumors (LST-NG type) have higher risk

Location:

Rectal lesions, esophageal squamous cell carcinoma, and Barrett's esophagus–related neoplasia have differing recurrence profiles

3. Patient Factors

Age and comorbidities: May influence healing and surveillance capability

Surveillance compliance: Early detection of recurrence is crucial

Timing of Recurrence

Most recurrences occur within the first 6–12 months

Surveillance is critical: endoscopic follow-up at 3–6 months post-resection, then at 1 year and longer intervals if clear

Surveillance Recommendations

EMR: More frequent surveillance needed, especially after piecemeal resection

ESD: Less intensive surveillance may be acceptable after complete (R0) resection

RA25:

The likelihood of recurrence after Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) depends on several factors, including the type of lesion, completeness of resection, pathology, and patient-specific risk factors.

Recurrence Rates

EMR:

Recurrence rates range from 10–30%, especially for piecemeal resections.

In piecemeal EMR for large lesions, recurrence can be as high as 20–30%.

For en bloc EMR (less common in large lesions), recurrence is lower: around 5–10%.

ESD:

Recurrence rates are significantly lower, generally <2–5%, due to higher rates of en bloc and R0 (complete margin-negative) resections.

Influencing Factors

1. Completeness of Resection

R0 resection (clear margins): Strongly associated with lower recurrence.

R1 or Rx (positive/uncertain margins): Higher recurrence risk.

2. Resection Technique

Piecemeal resection (common in EMR): Higher recurrence due to possible residual tissue.

En bloc resection (common in ESD): Better histological assessment, lower recurrence.

3. Lesion Characteristics

Size: Larger lesions (>20 mm) are more prone to incomplete resection, especially with EMR.

Histology: High-grade dysplasia, carcinoma, or submucosal invasion increase recurrence risk.

Location: Lesions in the colon (especially right-sided) may be more technically challenging.

4. Operator Experience

Recurrence is lower with experienced endoscopists and in high-volume centers.

5. Submucosal Fibrosis

Can make complete resection more difficult, especially in recurrent lesions.

6. Follow-Up

Inadequate surveillance can miss early recurrence.

Most recurrences occur within 6–12 months post-resection.

Surveillance Recommendations

EMR (piecemeal): Follow-up colonoscopy at 3 – 6 months, then annually if no recurrence.

ESD (en bloc, R0): May require less frequent surveillance (e.g., at 1 year, then longer intervals).

Q26. What postoperative signs may indicate incomplete lesion removal or potential recurrence after an ESD/EMR procedure?

A26:

After an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR), certain postoperative signs may suggest incomplete lesion removal or a potential recurrence. Recognizing these signs is critical for early detection and management. Here are the key indicators:

Clinical and Endoscopic Signs

1. Positive Resection Margins (R1 resection)

Histology shows tumor cells at the lateral or vertical margins.

Most direct indicator of incomplete resection.

2. Residual Lesion on Surveillance Endoscopy

Visible abnormal mucosa at or near the resection site.

Irregular vascular patterns, discoloration, or nodularity seen with chromoendoscopy or NBI (Narrow Band Imaging).

3. Local Recurrence on Follow-Up

Reappearance of neoplastic tissue at the original resection site, typically seen during scheduled surveillance (e.g., 3-6 months post-op).

More common in piecemeal EMR than en bloc ESD.

Histopathological Indicators

4. Lymphovascular Invasion

Even with negative margins, presence may signal increased risk of recurrence or metastasis.

5. Submucosal Invasion (≥SM2)

Deep invasion increases risk of residual disease or lymph node metastasis, especially in colorectal or esophageal lesions.

Symptoms (Less Specific, More Concerning for Advanced Recurrence)

6. New or Persistent Symptoms

Bleeding, pain, or obstruction after initial healing may suggest recurrence.

Weight loss or anemia may indicate advanced or metastatic disease.

Radiologic/Imaging Clues (especially for extraluminal spread)

7. New Lymphadenopathy or Masses on Imaging

Especially important in deeper invasive cancers or high-risk histology.

Detected via CT, MRI, or EUS (endoscopic ultrasound).

Best Practice: Follow-Up Protocols

Routine surveillance endoscopy: Usually at $3-6$ months post-procedure, then annually.

Biopsies from the scar or suspicious areas should be taken even in the absence of visible lesions.

If any of these signs are detected, further diagnostic steps, repeat endoscopic evaluation, or oncologic referral (e.g., for surgery or chemoradiation) may be warranted.

RA26:

After an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR), certain postoperative signs and findings may suggest incomplete lesion removal or potential recurrence of a neoplastic lesion. These include:

1.Clinical Signs and Symptoms

While many patients are asymptomatic post-procedure, the following can raise suspicion:

Persistent or recurrent gastrointestinal bleeding

Occurs days to weeks after the procedure

May indicate residual or recurrent lesion, particularly if from the same site

New or worsening abdominal pain

Unusual after initial healing period

May suggest complications such as perforation or tumor regrowth

Anemia without obvious bleeding

Especially if associated with known dysplastic lesions

2. Endoscopic Findings

During follow-up endoscopy (usually at 3–6 months post-ESD/EMR):

Residual visible lesion at the resection site

Irregular mucosa, nodularity, or mass-like tissue

Ulcer with atypical healing pattern

Irregular or raised borders, non-granulating surface

Scarring with nodularity

Could indicate recurrence rather than benign scar formation

Biopsy positive for dysplasia or carcinoma

Histology remains the gold standard for detecting recurrence

3. Histopathological Red Flags from the Initial Resection

These can predict incomplete resection or recurrence:

Positive or unclear margins (especially lateral)

Presence of dysplastic or neoplastic cells at the margin

Submucosal invasion >1,000 μm

Increased risk of lymphovascular spread or local recurrence

Lymphovascular invasion

High recurrence and metastasis risk

Piecemeal resection (common in EMR)

Limits ability to evaluate margins and increases recurrence risk

4. Imaging or Surveillance Findings

Suspicious lymphadenopathy or local mass on follow-up imaging (CT/MRI/EUS)

May suggest deeper recurrence or incomplete removal

5. Recommendations

Post-ESD/EMR surveillance typically includes:

Endoscopy at 3–6 months, then at 1 year, then annually

Biopsy of scar area

Imaging (if indicated) based on histology and resection completeness

Q27. If follow-up after ESD/EMR suggests recurrence, what should be done next?

A27:

If follow-up after Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) suggests recurrence of neoplasia (such as residual or recurrent adenoma or carcinoma), the next steps depend on the nature, size, and location of the recurrence, as well as the patient's overall condition. Here is a general approach:

1. Confirm Recurrence

Repeat endoscopy with biopsy is necessary to confirm histological recurrence.

High-definition white light and enhanced imaging (e.g., NBI or chromoendoscopy) can help delineate the lesion.

2. Assess Resectability

If the lesion is small and superficial, repeat endoscopic resection may be feasible (often via EMR or ESD).

Use endoscopic ultrasound (EUS) if submucosal invasion is suspected.

3. Treatment Options

A. Repeat Endoscopic Resection

For localized and superficial recurrence, salvage EMR or ESD is often effective.

B. Surgical Resection

Indicated if:

The recurrence is not amenable to endoscopic removal (e.g., fibrosis, deep invasion).

There is lymphovascular invasion, positive margins, or poor differentiation.

C. Surveillance

In selected patients with significant comorbidities or low-grade recurrence, careful endoscopic surveillance may be considered.

4. Histopathology Review

Re-examination of the original pathology can help understand risk factors for recurrence.

Margins, depth of invasion, and lymphovascular invasion guide decision-making.

5. Modify Surveillance Schedule

More frequent surveillance is typically recommended post-recurrence (e.g., at 3–6 month intervals initially).

RA27:

If follow-up after Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) suggests recurrence of neoplasia, the next steps typically include:

1. Confirm the Recurrence

Biopsy: Targeted biopsies of the suspicious area should be performed to confirm histological recurrence.

Imaging: Depending on the location and concern for deeper invasion or spread, imaging such as endoscopic ultrasound (EUS), CT, or MRI may be warranted.

2. Assess Recurrence Characteristics

Size and morphology of the recurrent lesion

Histologic type and grade (e.g., low-grade vs high-grade dysplasia, carcinoma)

Location: Flat vs raised, at the scar site or elsewhere

3. Management Options

Management depends on whether the recurrence is:

Local and Superficial:

Repeat Endoscopic Resection (ESD or EMR): Often possible, especially for small, well-demarcated lesions.

Ablative Therapy: In select cases (especially Barrett's esophagus), radiofrequency ablation (RFA) may be used after resection.

Deeper Invasion or Non-resectable Recurrence:

Surgery: For lesions with submucosal invasion or poor differentiation, esophagectomy, gastrectomy, or other oncologic surgery may be indicated.

Oncology Referral: If surgery is not feasible or for more advanced cases, systemic therapy and/or radiation may be required.

4. Adjust Surveillance Strategy

Shortened follow-up intervals

More intensive monitoring with high-definition endoscopy and chromoendoscopy or narrow-band imaging

5.Multidisciplinary Team (MDT) Discussion

A recurrence after ESD/EMR warrants discussion in an MDT setting to determine the optimal individualized treatment plan, especially when considering surgery, further endoscopic therapy, or palliative care.

Q28. In endoscopic therapy, how are ESD and EMR selected?

A28:

Endoscopic mucosal dissection (ESD) and endoscopic mucosal resection (EMR) are both minimally invasive methods used to treat early gastrointestinal cancer or polyps. The choice between the two depends on multiple factors, including the size, shape, location of the lesion, as well as the overall health status of the patient.

ESD (endoscopic mucosal dissection)

Applicable scope:

Usually used for larger lesions (diameter exceeding 2 centimeters).

Suitable for early cancer or high-grade polyps, especially when there is a risk of infiltration or incomplete resection of the lesion.

It can be used to remove complex or irregular lesions, such as flat or concave lesions in the esophagus, stomach, and colon.

Advantages:

Providing more complete resection and more accurate pathological results.

It is more helpful in eliminating the risk of recurrence.

Disadvantages:

The surgery takes a long time and is technically challenging, requiring experienced doctors to perform.

The risk is relatively high and may cause perforation and bleeding.

EMR (Endoscopic Mucosectomy)

Applicable scope:

Usually used for smaller lesions (diameter less than 2 centimeters).

Suitable for benign polyps or low-risk lesions, especially in the early stages.

Advantages:

The operation is relatively simple and the time is short.

Low risk, suitable for most doctors to master.

The economic cost is relatively low.

Disadvantages:

Suitable for smaller lesions, and the pathological results may not be as detailed as ESD.

The risk of recurrence is higher, especially in cases of incomplete resection.

Selection strategy

Type and size of lesions: Larger or more complex shaped lesions are more suitable for ESD, while smaller, low-risk lesions are more suitable for EMR.

Doctor experience: ESD requires high technical skills and experience, and the ability of a suitable doctor also affects the choice.

Patient willingness: After weighing the risks, surgical time, and outcomes, patients can discuss the best plan with their doctors.

After considering these factors comprehensively, the doctor will recommend the most suitable treatment plan for you based on your specific condition and needs.

RA28：

In endoscopic therapy, endoscopic mucosal dissection (ESD) and endoscopic mucosal resection (EMR) are both minimally invasive methods commonly used to treat early gastrointestinal cancer or polyps. The choice between the two should be determined based on the type, location, and specific patient condition of the lesion.

ESD (endoscopic mucosal dissection)

Applicable scope:

Usually used for larger lesions, especially those with a diameter greater than 2

centimeters.

Suitable for early cancer or high-grade polyps, especially when the risk of infiltration is high.

It can be used to remove lesions located in complex locations of the digestive tract, such as concave or flat lesions.

Advantages:

Providing complete resection to ensure the accuracy of pathological diagnosis.

Reducing the risk of disease recurrence or incomplete resection.

Disadvantages:

The surgery takes a long time and is difficult to perform, requiring experienced doctors.

The risk of complications such as bleeding and perforation is higher.

EMR (Endoscopic Mucosectomy)

Applicable scope:

Usually used for smaller lesions with a diameter of less than 2 centimeters.

Suitable for benign polyps and low-grade early cancer lesions.

Advantages:

The operation is relatively simple and fast, suitable for most doctors to perform.

The risk of complications is relatively low, and the economic cost is relatively low.

Disadvantages:

Suitable for smaller lesions, the completeness and accuracy of pathological results may not be as good as ESD.

If not completely removed, it may increase the risk of recurrence.

Selection Guide

The size and type of lesions: larger or complex lesions are suitable for ESD, while smaller and lower grade lesions are suitable for EMR.

Doctor's technical level: ESD requires higher skills and experience, and the selection needs to consider the doctor's abilities.

Patient's physical condition and willingness: It is necessary to consider the patient's overall health, surgical tolerance, and expected goals.

Based on these factors, doctors will choose the most suitable endoscopic treatment method for patients. It is important for patients to make decisions together with doctors after a detailed understanding of the risks and benefits.

Q29. What is the typical cost of an ESD/EMR procedure, and how is it covered by medical insurance?

A29:

The cost of ESD (Endoscopic Submucosal Dissection) and EMR (Endoscopic Mucosal Resection) procedures varies widely depending on the healthcare system, country, hospital setting (inpatient vs. outpatient), and whether complications arise. Here's a breakdown of typical costs and insurance coverage considerations:

Typical Cost Estimates (U.S. as an example)

EMR: $1,500 – $5,000 (Without Insurance); Often partially or fully covered (With Insurance)

ESD: $3,000 – $10,000+ (Without Insurance); Less common; coverage may vary (With Insurance)

1.Factors Affecting Cost

Location: U.S. prices are generally higher than in Europe or Asia.

Hospital Type: Academic centers often charge more.

Anesthesia and Facility Fees: These can double the procedure cost.

Biopsies and Pathology: Additional costs if tissue analysis is required.

Complications or Repeat Procedures: Increase the total cost significantly.

2.Insurance Coverage (U.S. Focus)

Medicare/Medicaid: Usually covers EMR and sometimes ESD if deemed medically necessary (e.g., removing pre-cancerous or cancerous tissue).

Private Insurance: Most will cover EMR; ESD is less common and might require preauthorization.

Outpatient vs. Inpatient: Outpatient procedures are often cheaper and more likely to be covered with minimal co-pays.

Diagnostic Codes: Coverage depends heavily on the diagnosis and medical justification (e.g., colorectal adenoma vs. routine screening).

3.International Context

Japan and South Korea: ESD is standard for early GI cancers and is often fully covered under national insurance.

Europe (e.g., UK, Germany): EMR and ESD may be available through public health systems with little or no out-of-pocket cost for patients.

4.How to Check Your Coverage

Get CPT and ICD-10 Codes from your provider for the exact procedure and diagnosis.

Contact Your Insurance Provider with those codes and ask about:

Coverage details

Deductibles and co-pays

Preauthorization requirements

Ask the Hospital Billing Office for an estimate based on your insurance plan.

RA29:

The cost of an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) can vary significantly based on factors such as:

Geographic location (U.S., Europe, Asia, etc.)

Whether it's performed in an outpatient surgery center or hospital

The complexity and location of the lesion (e.g., stomach, esophagus, colon)

Whether general anesthesia is used

Insurance coverage

1.Typical Costs (U.S.)

EMR $3,000 – $10,000+ (Uninsured); $500 – $3,000 (after insurance)

ESD $5,000 – $20,000+ (Uninsured); $1,000 – $5,000 (after insurance)

2.Insurance Coverage

In the U.S., both ESD and EMR are typically covered by health insurance if:

The procedure is deemed medically necessary (e.g., for early cancer or large pre-cancerous polyps)

It is pre-authorized (especially for ESD, which is less common)

The provider is in-network

Insurance typically covers:

The physician's fees (gastroenterologist or surgeon)

Anesthesia services

Facility charges (hospital or ambulatory center)

Pathology/lab testing (biopsy results)

You may still owe:

Deductible

Co-insurance (typically 10–30%)

Co-pay for outpatient services

3.International Costs

Japan/Korea/India (where ESD is more routine): $1,000 – $5,000 total, often covered under national healthcare systems.

Europe: Similar to the U.S. in private systems; covered under public systems if medically indicated.

Q30. How can the psychological state of patients be managed after an ESD/EMR

procedure to reduce anxiety and concerns?

A30:

Managing the psychological state of patients after Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) is crucial for recovery, adherence to follow-up, and quality of life. These procedures, while minimally invasive, can evoke significant anxiety due to cancer-related fears, uncertainty about outcomes, or procedural discomfort.

Here are evidence-based and practical approaches to managing patient anxiety and concerns post-ESD/EMR:

1. Pre-Discharge Education and Counseling

Clear communication: Ensure patients understand the nature of their lesion (e.g., benign, pre-cancerous, early-stage malignancy), the purpose and success of the procedure, and next steps.

Written and visual materials: Provide brochures or diagrams explaining what was done, expected recovery, dietary instructions, and warning signs.

Reassurance about prognosis: If pathology results are favorable, emphasize the curative potential of ESD/EMR.

2. Timely Communication of Pathology Results

Delays in pathology results can heighten anxiety.

Set expectations: Tell patients when to expect results.

Offer early follow-up (via phone or visit) to review pathology, explain findings, and

discuss surveillance.

3. Psychological Support

Screening: Use tools like GAD-7 or HADS to assess anxiety or depression in high-risk patients.

Referral: Consider referral to a psycho-oncologist or counselor if scores are high or the patient expresses distress.

Mindfulness or CBT-based interventions: Proven to reduce procedural and health-related anxiety.

4. Peer Support and Patient Communities

Encourage connection with others who have undergone similar procedures.

Online forums, support groups (especially for GI or cancer survivors), or hospital-based programs can help normalize experiences.

5. Follow-Up Structure and Access

Schedule follow-ups before discharge to reduce uncertainty.

Clear contact point: Provide a nurse navigator or GI nurse's contact for questions post-discharge.

Telehealth options: May reduce logistical burdens that add stress.

6. Patient Empowerment

Involve patients in decisions about surveillance intervals, lifestyle modifications, and diet. Educate them on recurrence risks and prevention.

7. Family/Caregiver Involvement

Including loved ones in discussions can help reassure patients and ensure social

support.

8. Address Physical Discomfort

Post-procedural symptoms (bloating, discomfort) can increase anxiety.

Managing these effectively with medication, reassurance, and realistic expectations improves psychological comfort.

RA30:

Managing the psychological state of patients after Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) is crucial to ensure emotional well-being, compliance with follow-up care, and improved overall recovery. Here's a structured approach to reduce post-procedure anxiety and concerns:

1. Pre-Discharge Communication

Clear Explanation of Outcomes: Patients should be informed (in simple terms) about the success of the procedure, any remaining concerns, and expected recovery.

Written Instructions: Provide easy-to-understand discharge instructions covering symptoms to monitor, medication schedules, dietary recommendations, and activity restrictions.

Opportunity: Allow patients and families to ask questions. This gives reassurance and helps correct any misconceptions.

2. Psychological Reassurance

Normalize Feelings: Let patients know that feeling anxious post-procedure is

common and expected.

Provide Emotional Support: Nurses or psychologists can use brief counseling techniques to validate concerns.

Involve Family: Including family members in discharge education improves patient confidence and support at home.

3. Structured Follow-Up

Timely Appointments: Schedule follow-up endoscopies or consultations in advance to give patients a roadmap.

Symptom Monitoring Support: Offer a helpline or messaging service where patients can report symptoms and get prompt reassurance or advice.

4. Educational Support

Information Booklets or Videos: Provide resources explaining the procedure, recovery, recurrence risk, and lifestyle tips.

Online Support Tools: Some patients benefit from secure apps or websites offering symptom checkers, diaries, or FAQs.

5. Mental Health Screening

Identify High-Risk Individuals: Use brief anxiety/depression screening tools (like GAD-7 or PHQ-9) post-procedure to flag patients needing extra support.

Referral to Psychologist/Psychiatrist: If needed, refer patients to mental health professionals for ongoing care.

6. Peer and Social Support

Patient Support Groups: Connect patients with others who have undergone similar

procedures.

Mentorship: Some hospitals offer "peer mentors" — past patients who can provide reassurance and lived-experience guidance.

7. Holistic Interventions

Mindfulness & Relaxation Techniques: Introduce apps or workshops on breathing exercises, meditation, or guided imagery.

Dietary Counseling: A dietitian can reduce anxiety about food restrictions and promote healing.

8. Cultural and Language Sensitivity

Provide all materials in the patient's native language.

Consider cultural beliefs around illness and healing, which may impact psychological adjustment.

ChatGPT, Chat Generative Pretrained Transformer; Q, Question; A, Answer; RA, Replication Answer

Supplementary Table 3. Complete list of all questions and Google's answers to them.

Q1. What is the anatomy of the gastrointestinal tract?

A1:

The anatomical structure of the gastrointestinal (GI) tract includes the digestive tract, which extends from the mouth to the anus, as well as several important accessory organs. The digestive tract is composed of the mouth, pharynx, esophagus, stomach, small intestine, and large intestine. The liver, gallbladder, and pancreas serve as accessory organs of the digestive system.

Detailed anatomical structures:

Mouth: The starting point of digestion, responsible for chewing and saliva secretion.

Pharynx: A shared passageway for both the digestive and respiratory systems, directing food into the esophagus.

Esophagus: A hollow muscular tube that transports food from the pharynx to the stomach.

Stomach: A J-shaped organ located in the upper abdomen, responsible for the initial digestion and storage of food.

Small intestine: The longest part of the gastrointestinal tract, divided into the duodenum, jejunum, and ileum. It is the main site for digestion and nutrient absorption.

Large intestine: Encircles the small intestine and includes the cecum, colon, and rectum. It is responsible for water absorption and feces formation.

Q2. What are the surgical indications/indications for ESD/EMR?

A2:

The primary indications for Endoscopic Submucosal Dissection (ESD) and Endoscopic Mucosal Resection (EMR) are the treatment of early gastrointestinal cancers or precancerous lesions, particularly those that are difficult to completely remove using conventional endoscopic techniques. ESD is suitable for larger or more deeply infiltrating lesions, while EMR is more appropriate for smaller lesions confined to the mucosal layer.

Specifically:

Indications for ESD:

Early-stage gastrointestinal cancers, especially flat, depressed, or small lesions

Early gastric and colorectal cancers with submucosal invasion limited to the SM1 layer

Larger lesions that cannot be completely resected by EMR

Patients who are elderly, have contraindications to surgery, are at high risk for lymph node metastasis, or refuse surgical treatment

Indications for EMR:

Smaller lesions confined to the mucosal layer

Early gastric or colorectal cancers

Verrucous lesions

It is important to note that the indications for ESD and EMR also depend on the specific characteristics of the lesion, the patient's overall health condition, and the endoscopist's expertise. For instance, in patients with significant comorbidities, EMR is often preferred due to its shorter procedural time. In general, lesions suitable for EMR or ESD are often moderately or well-differentiated adenocarcinomas or papillary carcinomas, without ulceration, and with a diameter less than 2 cm.

In summary, both ESD and EMR are minimally invasive procedures used to treat early gastrointestinal cancers and precancerous lesions, but they differ in their indications and applicable lesion profiles.

Q3. What is the specific surgical process for ESD/EMR?

A3:

Endoscopic Submucosal Dissection (ESD) and Endoscopic Mucosal Resection (EMR) are endoscopic procedures used to remove lesions such as polyps or early-stage tumors from the gastrointestinal tract. The primary difference between the two lies in their techniques: ESD involves lifting the lesion by injecting fluid beneath it and then dissecting it with specialized knives, whereas EMR removes the lesion using a snare or a specific cutting device.

ESD Procedure:

1.Endoscope insertion:

The endoscope is inserted through the mouth or anus to locate the lesion within the digestive tract.

2.Submucosal injection:

A solution (e.g., glycerol, epinephrine, methylene blue) is injected beneath the lesion to elevate it and separate it from the surrounding tissues.

3.Dissection:

Special knives such as the IT knife or Flex knife are used to carefully dissect around and beneath the lesion, enabling en bloc resection.

4.Tissue retrieval:

The resected lesion is collected and sent for pathological examination to determine the lesion type and malignancy.

EMR Procedure:

1.Endoscope insertion:

An endoscope equipped with a snare or special knife is inserted to locate the lesion.

2.Lesion targeting:

The lesion is either ensnared with a loop or directly cut using a specific device.

3.Resection:

Depending on the size and nature of the lesion, it is resected using a snare or other instruments.

4.Tissue retrieval:

The excised tissue is sent for pathological assessment.

Summary of Differences:

ESD can remove larger and even submucosal lesions.

EMR is more suitable for smaller lesions limited to the mucosal layer.

ESD offers a higher complete and en bloc resection rate, but carries a higher risk of complications.

EMR has a lower complication rate, but is limited in its resection depth and size.

In conclusion, the choice between ESD and EMR depends on the lesion's type, size, and location, as well as the endoscopist's experience and clinical judgment.

Q4. What are the contraindications for ESD/EMR?

A4:

The contraindications for Endoscopic Submucosal Dissection (ESD) and Endoscopic Mucosal Resection (EMR) mainly include the following:

1.Severe cardiopulmonary diseases, hematological disorders, or coagulation dysfunction:

These conditions can increase the risk of intraoperative bleeding and infection. ESD or EMR should not be performed until these conditions are well controlled.

2.Tumor infiltration into the muscularis propria:

Since ESD and EMR are primarily indicated for lesions confined to the mucosal or submucosal layers, they are not suitable when the tumor has invaded the muscularis

propria.

3.Negative lifting sign:

If submucosal injection (e.g., with saline) does not elevate the lesion, it may indicate adhesion to deeper layers or muscular invasion, making ESD unsuitable.

4.Confirmed early gastric cancer with lymph node or distant metastasis:

In such cases, ESD or EMR would be palliative rather than curative and therefore is not recommended.

5.Patient refusal of ESD or EMR:

Patient autonomy must be respected. If the patient declines the procedure, it should not be performed.

6.Poor general condition:

Patients in poor physical health or with weakened immunity may have difficulty recovering after the procedure, making ESD or EMR inadvisable.

In summary, the contraindications for ESD and EMR mainly relate to the patient's overall health status and the depth of tumor invasion. A comprehensive preoperative evaluation is essential to ensure the safety and efficacy of the procedure.

Q5. What should patients do before ESD/EMR?

A5:

Before undergoing Endoscopic Submucosal Dissection (ESD) or Endoscopic

Mucosal Resection (EMR), patients should carefully listen to their physician's explanation of the procedure, its risks, and potential complications, and sign an informed consent form. They must also follow medical instructions regarding dietary restrictions and medication adjustments, including bowel preparation. On the day of the procedure, patients should fast and inform the physician of any health conditions or medications that might affect the surgery.

Detailed Preparation:

1.Understanding the procedure and risks:

The physician will explain the ESD/EMR procedure in detail, including how it is performed, possible complications (such as bleeding or perforation), and the expected recovery timeline.

Patients should fully understand the benefits and risks, ask questions, and sign an informed consent form to confirm their agreement to proceed.

2.Dietary and medication adjustments:

Diet: Patients should avoid high-fat and high-fiber foods the evening before the procedure to aid bowel preparation.

Medications: Based on the patient's current medications, the physician will advise whether certain drugs — particularly anticoagulants, antiplatelet agents, or analgesics—need to be paused or adjusted.

Bowel preparation: If the lesion is in the colon, bowel cleansing will be required to eliminate stool and residue from the intestines.

3.Fasting and disclosure of health status:

Patients must fast on the day of the procedure.

They should inform their physician of any medical conditions that might impact the procedure, such as heart disease, respiratory issues, or recent infections.

Patients must also disclose all medications they are currently taking, including prescription drugs, over-the-counter medications, and herbal supplements.

4.Preoperative evaluation:

Physicians may conduct preoperative assessments such as blood tests and coagulation profiles to determine the patient's suitability for the procedure.

If general anesthesia is planned, additional evaluations of cardiac and respiratory function may be necessary.

5.Postoperative arrangements:

Patients should arrange for someone to accompany them home after the procedure, as sedatives may be used.

Postoperative care should follow medical advice, including observation, rest, and avoidance of strenuous activities or heavy lifting.

Note:

Preoperative preparation and postoperative care are essential to the success of the procedure and the patient's recovery.

Patients are encouraged to communicate openly with their physicians, stay informed, and address any concerns promptly.

Maintaining a positive and cooperative attitude is important throughout the process, trusting in the expertise of the medical team.

Q6. What preoperative measures for ESD/EMR can help reduce surgical risks?

A6:

To minimize risks during Endoscopic Submucosal Dissection (ESD) and Endoscopic Mucosal Resection (EMR), several preoperative measures are crucial. These include optimizing patient preparation with bowel cleansing, managing medications like antithrombotic drugs, and carefully assessing the lesion and its potential for complications.

1. Patient Preparation:

Bowel Cleansing:

For lower GI procedures, a liquid diet and laxative or enema are used to clean the bowel. For upper GI procedures, patients fast for 12 hours.

Medication Management:

Patients on antithrombotic drugs require careful evaluation and potential modification to minimize bleeding risks.

Patient Education:

Patients need to understand the procedure, potential risks and benefits, and post-procedure care.

2. Lesion Assessment:

Pre-procedure Imaging: High-resolution endoscopy, magnification, and narrow-band

imaging (NBI) can help delineate the lesion, its size, and depth.

Lesion Classification: Paris Classification and other systems can help assess the risk of submucosal invasion and guide treatment decisions.

Staining: Iodine staining can be used to mark lesion boundaries.

3. Intraoperative Measures (To Minimize Bleeding and Perforation):

Injection Solutions:

Epinephrine, indigo carmine, and local anesthesia agents (like lidocaine) may be added to injection solutions to aid in visualization, hemostasis, and reduce pain.

Bleeding Control:

Electrocautery and other hemostatic techniques are used during the procedure to minimize bleeding.

Perforation Prevention:

Careful dissection and the use of dilution needles can help prevent perforation.

4. Postoperative Measures (To Manage Complications):

Bleeding Control: Proton pump inhibitors (PPIs) may be used to prevent post-ESD bleeding.

Pain Management: Pain management strategies, including medications and other techniques, can be implemented.

Monitoring: Post-procedure monitoring for complications like bleeding and perforation is essential.

Q7. What are the possible problems and solutions that may be encountered during the ESD/EMR process?

A7:

During ESD and EMR procedures, potential problems include perforation, bleeding, strictures, and difficulties with submucosal injection. Solutions to address these include endoscopic clipping, suturing, or surgical intervention for perforation, hemostatic methods for bleeding, stricture dilation, and exploring alternative submucosal injection solutions.

Possible Problems and Solutions:

Perforation:

Problem: Perforation is a rare but serious complication, with higher rates in ESD compared to EMR.

Solution: Small perforations can be closed endoscopically with clips or sutures. For larger perforations, surgical intervention and broad-spectrum antibiotics may be necessary.

Bleeding:

Problem: Bleeding, either intraprocedural or delayed, is a common complication of both EMR and ESD.

Solution: Intraprocedural bleeding can be managed with techniques like electrocautery, endoscopic clips, or hemostatic powders.

Stricture:

Problem: Strictures can develop after ESD, particularly in the esophagus and stomach.

Solution: Strictures can often be treated with pneumatic balloon dilation. In cases where strictures are refractory to balloon dilation, surgical intervention may be necessary.

Submucosal Injection Challenges:

Problem: Maintaining a stable and effective submucosal cushion can be challenging, especially during longer procedures or when resecting larger lesions.

Solution: Various alternative injection solutions, such as hyaluronic acid or fibrinogen solutions, have been investigated to improve the cushion's stability and efficacy.

Technical Difficulties:

Problem: ESD, in particular, can be technically challenging, requiring significant experience and expertise.

Solution: Training programs, specialized equipment, and experienced endoscopists are crucial for successful ESD.

Procedural Time:

Problem: ESD procedures can be significantly longer than EMR, potentially leading to increased patient stress and the need for longer anesthesia periods.

Solution: Advances in injection solutions, knives, and other accessories can help to streamline the procedure and reduce its duration.

Q8. Will sedation or anesthesia be used during ESD/EMR, and will the procedure cause pain or discomfort? How long does the procedure usually take?

A8:

Yes, sedation or anesthesia is generally used during ESD/EMR procedures, and patients usually do not experience significant pain or discomfort during the procedure itself. The procedure usually takes between 30 minutes and a few hours, depending on the size and location of the lesion.

Sedation/Anesthesia:

EMR/ESD procedures are typically performed under conscious sedation or general anesthesia to ensure patient comfort and allow for a clear view of the area being treated.

Conscious sedation involves administering medication that produces a relaxed, sleepy state without complete unconsciousness.

General anesthesia may be used for more complex cases or when the patient prefers to be fully unconscious.

Anesthesia for the procedure is provided by an anesthesiologist or anesthesia team.

Pain and Discomfort:

While the procedure itself is typically painless due to sedation, patients may experience some mild discomfort after the procedure.

This discomfort may include a sore throat, bloating, gas, or abdominal cramps.

Significant pain after ESD can be a sign of a complication and should be discussed with your doctor.

Procedure Time:

EMR (Endoscopic Mucosal Resection) procedures generally take between 30 to 60 minutes.

ESD (Endoscopic Submucosal Dissection) procedures can take longer, sometimes ranging from 1 to 4 hours or even longer.

The exact time can vary depending on the size and location of the lesion, as well as the complexity of the procedure.

Q9. What cooperation and precautions are required from the patient during an ESD/EMR procedure?

A9:

During an ESD/EMR procedure, patient cooperation and precautions primarily involve preparation, including a clear liquid diet, bowel cleansing, and avoiding food and fluids before the procedure. Post-procedure, patients need to follow dietary guidelines and be aware of potential symptoms like bleeding or fever.

Pre-Procedure Cooperation and Precautions:

Dietary Restrictions:

Following a clear liquid diet and avoiding food and fluids, especially after midnight

before the procedure, is crucial.

Bowel Cleansing:

If the procedure involves the colon, patients may need to clean their bowels with a laxative or enema.

Medication Adjustments:

Patients should inform their doctor about any medications they are taking, especially blood thinners, and follow their doctor's instructions for adjustments.

Transportation:

Arranging for someone to drive them home after the procedure is important as they will be sedated.

Anesthesia/Sedation:

Patients will receive medication to make them sleepy, and they should be prepared for potential sedation.

Post-Procedure Cooperation and Precautions:

Dietary Guidelines:

Following dietary guidelines, such as consuming a liquid diet initially, is essential after the procedure.

Monitoring for Symptoms:

Patients should be aware of potential symptoms like bleeding, fever, or pain and contact their doctor if they experience them.

Medication Adherence:

Following any medication instructions given by the doctor, such as proton pump

inhibitors, is important.

Activity Restrictions:

Patients may need to restrict strenuous activities after the procedure, especially if it was a more extensive ESD/EMR.

Q10. What are the factors influencing the safety and success rate of ESD/EMR procedures?

A10:

The safety and success rate of Endoscopic Mucosal Resection (EMR) and Endoscopic Submucosal Dissection (ESD) procedures are influenced by several factors, including the operator's experience, the nature and location of the lesion, and the use of appropriate techniques and devices. Complications like bleeding and perforation are also significant, and these can affect the overall success of the procedure.

Here's a more detailed breakdown of the factors:

1. Operator Experience and Skill:

Endoscopist Expertise:

The experience and skill of the endoscopist are crucial for the safety and success of both EMR and ESD procedures. More experienced operators are better equipped to handle complex situations and minimize the risk of complications.

Training and Learning Curve:

ESD, in particular, has a longer learning curve due to its technical complexity. Comprehensive training programs and experienced mentors are essential for developing the necessary skills.

2. Lesion Characteristics:

Lesion Size and Location:

The size and location of the lesion can impact the choice of procedure and the risk of complications. Larger lesions or those in areas with thinner walls, like the colon, may be more challenging to remove safely.

Lesion Type:

The type of lesion, whether benign or cancerous, and its depth of invasion, will influence the approach and the expected outcome.

3. Procedural Techniques and Devices:

Injection Technique:

The submucosal injection used to elevate the lesion for resection is a critical part of both EMR and ESD. Proper injection technique ensures a sufficient submucosal cushion, minimizing the risk of perforation and bleeding.

Specific Devices:

ESD knives and other specialized instruments are used to dissect the submucosa, and their quality and proper use can significantly affect the procedure's safety and success.

Hemostasis Techniques:

Effective hemostasis, or stopping bleeding, is crucial to prevent post-procedure complications. Various methods, including electrocoagulation and clips, are used to control bleeding during the procedure and afterward.

4. Patient Factors:

Anatomical Considerations:

The anatomy of the GI tract, including the thickness of the wall and the presence of underlying structures, can influence the difficulty of the procedure.

Comorbidities:

Pre-existing conditions, such as bleeding disorders or cardiovascular disease, can increase the risk of complications.

5. Post-Procedure Management:

Follow-up:

Regular follow-up examinations are essential to monitor for recurrence or complications after EMR or ESD.

Symptom Management:

Patients should be aware of potential complications like bleeding, perforation, and stricture, and they should seek medical attention if they experience concerning symptoms.

Q11. How is the resected tissue handled after an ESD/EMR procedure?

A11:

After ESD (Endoscopic Submucosal Dissection) or EMR (Endoscopic Mucosal Resection), the resected tissue is carefully handled to ensure proper analysis and follow-up. The tissue is often collected within a basket or cap and then removed from the digestive tract, followed by a process to secure the tissue and send it to the pathology lab.

Detailed Handling:

1. Retrieval:

The resected tissue is typically retrieved using specialized instruments, such as a snare or suction device, and may be captured within a cap.

2. Securing:

Once retrieved, the tissue is often placed within a container or on a specific surface to prevent any loss or damage.

3. Pathology:

The resected tissue is then sent to the pathology laboratory for analysis to determine the nature and extent of the tissue. This can involve examining the tissue under a microscope to identify any abnormal cells or features.

4. Follow-up:

Depending on the findings and the type of procedure, follow-up procedures such as colonoscopies or biopsies might be required to monitor for residual disease or recurrence.

Q12. What is the expected timeframe and method for accessing pathology results after an ESD/EMR procedure?

A12:

After an EMR or ESD procedure, pathology results are typically available within 5 to 7 days. The removed lesion will be sent to pathology for microscopic examination. Your referring physician will receive these results, and they will likely discuss them with you to determine if further follow-up or treatment is needed. You may also need to follow up with the clinic where the procedure was performed.

Elaboration:

EMR (Endoscopic Mucosal Resection) and ESD (Endoscopic Submucosal Dissection): are endoscopic procedures used to remove polyps or lesions from the digestive tract.

The removed tissue is sent to a pathology laboratory for analysis to determine its nature (e.g., benign vs. cancerous).

Timeframe: The pathology analysis usually takes a few days, typically 5-7 days.

Method of Access: The results are typically sent to your referring physician, who will then communicate them to you. You may also need to follow up with the clinic where the procedure was performed to receive the results.

Follow-up: Depending on the pathology results, your doctor may recommend further follow-up, such as additional endoscopic procedures or other treatments.

Q13. Which terms in the pathology report after an ESD/EMR procedure should be given special attention?

A13:

In pathology reports following an ESD/EMR procedure, special attention should be paid to the depth of invasion, margin status, and the presence of lymphovascular or venous invasion. These terms are crucial for determining prognosis and guiding further treatment decisions. Additionally, the presence of tumor deposits, even when not clearly metastatic, should be noted.

Here's a more detailed breakdown:

Depth of Invasion:

This indicates how deeply the tumor has penetrated the submucosa. It's essential for staging the cancer and determining the need for further treatment, such as surgical resection.

Margin Status:

This refers to whether the tumor cells reach the edges of the removed tissue. Negative margins indicate that the tumor was completely removed, while positive margins suggest the possibility of recurrence.

Lymphovascular/Venous Invasion:

This indicates whether the tumor cells have spread into the lymphatic or venous

vessels, increasing the risk of metastasis.

Tumor Deposits (TDs):

These are tumor cells found within the lymphatic drainage area of the primary tumor but without identifiable lymph node structures. They are not considered metastatic but are associated with a poorer prognosis and require further investigation.

Differentiation:

The level of differentiation (well, moderate, or poorly differentiated) can provide information about the aggressiveness of the tumor and guide treatment decisions.

Size of the Lesion:

This helps determine the appropriate treatment strategy, especially for early gastric cancers.

Ulceration or Scar:

The presence of an ulcer or scar can impact the staging and treatment of the tumor.

Associated Findings:

Other findings, such as gastritis, can provide additional context for the diagnosis.

Q14. What are the relevant definition standards and classifications for postoperative complications of ESD/EMR?

A14:

Postoperative complications following Endoscopic Submucosal Dissection (ESD)

and Endoscopic Mucosal Resection (EMR) are classified and defined by medical societies and guidelines, with the most common being bleeding and perforation. Bleeding is further categorized as intraoperative and delayed postoperative, with delayed bleeding often requiring endoscopic hemostasis. Perforation can be managed endoscopically or surgically, depending on the severity and patient condition.

Specific Complications and Definitions:

Bleeding:

Intraoperative Bleeding: Active bleeding during the procedure.

Postoperative Delayed Bleeding: Bleeding occurring >6 hours after the procedure, typically manifesting as blood in the stool or a decrease in hemoglobin.

Significance: Bleeding is a common complication, with rates varying between studies due to different definitions.

Perforation:

Intraprocedural Perforation: Detected during the procedure.

Delayed Perforation: Less common, but may require surgery more frequently.

Significance: Perforation can be managed endoscopically with clips, but surgical repair may be necessary in certain cases.

Other Complications:

Stricture: Narrowing of the esophagus or other affected area.

Pneumonia: Infection of the lungs.

Air Embolism: Air in the blood circulation.

Post-ESD Coagulation Syndrome: Mimics localized peritonitis from perforation.

Classifications and Management:

Japanese Guidelines:

Suggests using hemostatic forceps for remnant vessels on the ulcer surface.

Endoscopic Management:

Endoscopic clip closure is often the first attempt for perforation management.

Surgical Management:

Perforation that cannot be managed endoscopically, or delayed perforations, may require surgery.

Postoperative Surveillance:

Long-term follow-up is recommended.

Key Organizations and Resources:

Japan Gastroenterological Endoscopy Society (JGES): Provides guidelines for ESD and EMR.

Clinical Endoscopy: Publishes articles on the management of complications associated with C-ESD.

World Journal of Surgical Oncology: Publishes research on ESD/EMR complications.

Note: The specific definitions and classifications may vary slightly between different organizations and guidelines, but the core principles remain the same.

Q15. What are the common postoperative complications and related treatments

of ESD/EMR?

A15:

Common postoperative complications after endoscopic mucosal resection (EMR) and endoscopic submucosal dissection (ESD) include bleeding and perforation. Other potential complications include stricture, pneumonia, and air embolism. Management of these complications often involves endoscopic hemostasis, clip closure for perforation, and in some cases, surgical intervention or interventional radiology.

Common Complications and Their Management:

Bleeding:

Bleeding is a frequent complication of both EMR and ESD.

Most bleeding can be managed endoscopically with hemostatic forceps, hot biopsy forceps, or clipping.

Severe or persistent bleeding may require blood transfusions, interventional radiology, or surgery.

Perforation:

Perforation is another common complication, especially with ESD.

Endoscopic clip closure is often the first line of treatment for perforations.

Larger perforations, or those that are not effectively closed endoscopically, may require surgery.

Stricture:

Stricture formation can occur after ESD, especially in the esophagus, due to inflammation and scarring.

Strictures are often treated with endoscopic balloon dilation.

Other Complications:

Pneumonia, air embolism, and electrocoagulation syndrome are less frequent but still possible complications.

Risk Factors and Prevention:

Patient factors such as age, lesion size, and underlying medical conditions can increase the risk of complications.

Technique and experience of the endoscopist also play a role in the incidence of complications.

Safe ESD and EMR procedures involve careful planning, appropriate equipment, and meticulous technique.

Postoperative care, including monitoring for bleeding and perforation, is also important.

Q16. What are the influencing factors of postoperative complications in ESD/EMR?

A16:

Several factors can influence postoperative complications after Endoscopic

Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR), including patient characteristics, lesion characteristics, procedure details, and postoperative management. Bleeding and perforation are the most common complications.

Factors Influencing Complications:

Patient Factors:

Age: Older patients may have a higher risk of complications, especially bleeding.

Underlying medical conditions: Conditions like hypertension, cardiovascular disease, and renal disease can increase the risk of bleeding and other complications.

Antithrombotic medications: Use of aspirin, thienopyridines, or direct oral anticoagulants (DOACs) significantly increases the risk of bleeding.

Alcohol consumption: Excessive alcohol intake may affect blood clotting and increase the risk of bleeding.

Lesion Characteristics:

Lesion size: Larger lesions are associated with a higher risk of bleeding and perforation.

Location: Lesions in the stomach, particularly in the lower and middle thirds, may increase the risk of perforation.

Histological type: Certain types of tumors may be more prone to complications.

Procedure Details:

Duration of procedure: Longer procedures may increase the risk of perforation and bleeding.

Operator experience: Insufficient operator experience may increase the risk of

complications.

Technique: The specific ESD or EMR technique used can influence the risk of complications.

Postoperative Management:

Control of bleeding: Poor control of intraoperative bleeding can lead to delayed bleeding.

Postoperative stricture: Extensive esophageal ESD can cause stricture, which can lead to dysphagia and other complications.

Specific Complications and Risk Factors:

Bleeding:

Post-ESD ulcer bleeding: The BEST-J score, a predictive model, can help assess the risk of post-ESD ulcer bleeding.

Delayed bleeding: This can occur after the procedure, and risk factors include lesion size, location, and use of antithrombotic agents.

Perforation:

Risk factors: Lesion size, location, submucosal fibrosis, and procedure time can increase the risk of perforation.

Stricture:

Esophageal stricture: This is a major complication of esophageal ESD, especially if the resection is extensive.

Other complications: Dysphagia, pain, and reduced quality of life can result from stricture.

Preventive Measures:

Risk stratification:

Using tools like the BEST-J score to identify patients at higher risk of complications can help guide management.

Individualized treatment:

Tailoring the treatment plan to the patient's specific risk factors can help minimize complications.

Early detection and management:

Monitoring for complications after the procedure and intervening promptly can help prevent severe outcomes.

Continued research:

Further research is needed to identify new risk factors and develop strategies to prevent and manage complications.

Q17. What are the observation indicators for the therapeutic effect of ESD/EMR?

A17:

The main outcome measures used to evaluate the effectiveness of Endoscopic Submucosal Dissection (ESD) and Endoscopic Mucosal Resection (EMR) include en bloc resection rate, complete resection rate, lymph node metastasis rate, local

recurrence rate, complication rate (e.g., bleeding, perforation, stricture), and postoperative follow-up results.

Specifically:

En bloc resection rate: Refers to the proportion of lesions that are removed in a single, intact piece under endoscopic guidance, yielding a single specimen.

Complete resection rate: Refers to the proportion of en bloc resected specimens where histopathological evaluation confirms tumor-free lateral and basal margins, with no evidence of residual tumor at the resection margins.

Lymph node metastasis rate: The proportion of patients found to have lymph node metastases during postoperative follow-up.

Local recurrence rate: The proportion of patients who develop recurrent lesions at the original resection site during follow-up.

Complication rate: The incidence of intraoperative and postoperative complications such as bleeding, perforation, stricture, or infection.

Follow-up results: Regular postoperative surveillance to monitor patient survival, recurrence, and quality of life.

Preoperative evaluation: Includes assessment of the lifting sign, magnifying endoscopy, or endoscopic ultrasonography (EUS) to determine whether the lesion is suitable for ESD/EMR.

Patient preparation: Involves preoperative coagulation function tests such as platelet count, prothrombin time (PT), or international normalized ratio (INR) to assess bleeding risk, with correction of any abnormal parameters before surgery.

These indicators provide a comprehensive evaluation of the efficacy of ESD/EMR and help guide clinical decision-making. For instance, a high en bloc and complete resection rate combined with low lymph node metastasis and recurrence rates indicates favorable treatment outcomes. Conversely, a high complication rate suggests the need for technical improvements and enhanced postoperative care.

Q18. What postoperative symptoms are considered normal after an ESD/EMR procedure?

A18:

After an Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) procedure, some postoperative symptoms are considered normal and include mild abdominal discomfort, bloating, and gas. It is also normal to experience a sore throat if the procedure involved passing the endoscope through the mouth. Nausea or vomiting, especially if the stomach or intestine was treated, is also possible. These symptoms typically resolve within 24 hours.

Elaboration:

Abdominal Discomfort and Bloating:

These are common due to the air or gas injected into the digestive tract to facilitate the procedure.

Sore Throat:

If the endoscope was passed through the mouth, the throat may be sore from the insertion of the instrument.

Nausea and Vomiting:

These can occur if the stomach or intestine was treated during the procedure.

Gas and Cramps:

Air is often injected into the digestive tract to create space for the procedure, which can lead to gas, bloating, and cramping.

Mild Bleeding:

Some minor bleeding is also considered normal, especially in the first few hours after the procedure.

Important Considerations:

Severity and Duration:

If symptoms are severe or persist beyond 24-48 hours, or if you experience signs of infection (fever, chills, etc.) or excessive bleeding, it's crucial to contact your doctor or healthcare provider immediately.

Medication:

If you're prescribed any medications, be sure to follow your doctor's instructions for taking them after the procedure.

Diet:

Your doctor will provide guidance on when you can resume eating and drinking normally.

Activity:

Avoid strenuous activities for a few days after the procedure, especially if you've had a procedure in the colon.

In summary: While some postoperative symptoms are normal, it's important to monitor your condition and seek medical attention if you experience severe or persistent symptoms or signs of infection.

Q19. Do patients need family accompaniment after an ESD/EMR procedure, and for how long is it recommended?

A19:

Yes, patients undergoing an ESD/EMR procedure generally require family accompaniment. It's recommended that patients have a responsible adult accompany them home and remain with them for a period of time, typically 24 hours, following the procedure. This is because the sedation used during the procedure can impair judgment and coordination, making it unsafe for patients to drive or operate machinery.

Here's why family accompaniment is important:

Sedation and Recovery:

The sedation used during ESD/EMR can cause drowsiness and delayed reaction time, making it unsafe for patients to drive or operate machinery.

Post-Procedure Monitoring:

A responsible adult can monitor the patient for any signs of complications or unexpected reactions to the procedure.

Assistance with Recovery:

The sedative medication can have varying effects, so a family member can assist with activities like eating, drinking, and going to the bathroom.

Safety and Support:

Having someone with you for the first 24 hours provides a sense of safety and support during the recovery period.

In summary, while patients can usually go home the same day after an ESD/EMR procedure, it's crucial to have a responsible adult to accompany them home and remain with them for the recommended 24-hour period. This ensures their safety and well-being during the initial recovery phase.

Q20. What are the postoperative care precautions for ESD/EMR?

A20:

Postoperative care for Endoscopic Mucosal Resection (EMR) and Endoscopic Submucosal Dissection (ESD) generally involves a liquid diet for a few days to allow healing, followed by soft foods, and then a gradual return to a normal diet. Patients should also be aware of potential bleeding or other symptoms and report them to their doctor.

Dietary Restrictions:

Initial Liquid Diet:

For the first 1-2 days post-procedure, a liquid diet is recommended to allow the digestive tract to heal.

Soft Foods:

Following the liquid diet, soft or pureed foods can be introduced for another 2 days.

Normal Diet:

After the initial soft diet, a gradual return to a normal diet can be attempted, but avoid meat and dry foods (like toast, biscuits, crackers) for a few more days, according to Guy's and St Thomas' NHS Foundation Trust.

Monitoring for Complications:

Bleeding:

Patients should be monitored for signs of bleeding, such as blood in the stool or a noticeable drop in hemoglobin levels, which may indicate delayed bleeding.

Pain and Fever:

Any new or worsening pain, or fever, should be reported to the doctor, says North Tees and Hartlepool NHS Foundation Trust.

Other Symptoms:

Any other unusual symptoms or concerns should be discussed with the medical team.

Medications:

Proton Pump Inhibitors (PPIs):

PPIs, like omeprazole or lansoprazole, may be prescribed to reduce acid production

and promote healing.

Antithrombotic Drugs:

If the patient is taking antithrombotic drugs (like aspirin or warfarin), their doctor will determine if they need to be temporarily discontinued or adjusted, according to the Wiley Online Library.

Other Precautions:

Hydration:

Drinking plenty of fluids is important to aid healing and prevent dehydration.

Rest:

Taking it easy and avoiding strenuous activity for a few days is recommended to allow the body to recover.

Follow-up:

Patients should follow up with their doctor as scheduled to monitor for any complications or recurrence of the condition.

Q21. What are the application and precautions of drugs and food after ESD/EMR surgery?

A21:

After ESD/EMR surgery, a clear liquid diet is generally recommended for the first 1-2 days, followed by soft foods and then gradually progressing to a normal diet.

Medications, especially acid-reducing medications like proton pump inhibitors (PPIs), may be continued as prescribed, and the patient should follow their doctor's specific instructions regarding medication adjustments.

Medication Precautions:

Antithrombotic drugs:

The risk of delayed bleeding after ESD/EMR is higher in patients taking antithrombotic drugs, so the decision to continue or discontinue these medications should be carefully considered by the physician.

Steroids:

While local steroid injections (like triamcinolone) can be used to prevent strictures, there's a risk of complications like perforation and esophagitis.

Other medications:

Follow your doctor's specific instructions regarding all medications, including over-the-counter drugs and supplements.

Food Precautions:

Avoid dry or hard foods: These can be difficult to swallow and may irritate the healing site.

Avoid fibrous foods: These can also be difficult to swallow and may cause irritation.

Chew food thoroughly: This helps prevent choking and reduces the workload on the healing area.

Drink plenty of fluids: Staying hydrated is important for healing and preventing complications.

Monitor for any signs of complications: If you experience fever, difficulty swallowing, severe pain, or any other concerning symptoms, contact your doctor immediately.

Q22. What are the daily life precautions for postoperative ESD/EMR?

A22:

During the first week after undergoing Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR), patients should avoid strenuous activity and abdominal strain, consume a light and easily digestible diet, refrain from irritant foods and beverages, and monitor their physical condition, seeking medical attention promptly if needed. Detailed precautions are as follows:

1. Diet:

Avoid irritant foods and beverages:

For one week, avoid spicy, greasy, or strongly stimulating foods such as tobacco, alcohol, strong tea, and coffee.

Choose light and easily digestible foods:

Opt for liquid or semi-liquid meals such as porridge, soups, soft rice, and vegetable purée.

Eat smaller meals more frequently:

Avoid overeating in a single sitting to reduce intestinal burden.

Maintain smooth bowel movements:

Consume vegetables, fruits, bananas, and drink plenty of water. If constipation occurs, consult a doctor for appropriate laxatives based on your condition.

2. Physical activity:

Avoid strenuous activities:

Refrain from running, swimming, playing sports, or any vigorous exercise during the first week.

Avoid abdominal straining:

Avoid forceful coughing, straining during defecation, and lifting heavy objects to prevent bleeding from the wound.

Engage in light activity:

Gentle activities like walking are encouraged to promote circulation.

3. Monitor bodily responses:

Watch for abdominal pain:

Seek immediate medical attention if severe or persistent abdominal pain occurs.

Watch for bloody or black stools:

If you experience large amounts of blood in stool or black, tarry stools, seek immediate medical care.

Watch for fever:

Contact your doctor if you develop a fever.

4. Other precautions:

Ensure adequate sleep:

Restful sleep supports postoperative recovery.

Maintain a positive mindset:

Avoid excessive stress or anxiety and stay optimistic.

Attend scheduled follow-ups:

Follow your doctor's instructions for timely reexaminations to detect and manage potential complications early.

If anesthesia was used:

Avoid driving, operating machinery, consuming alcohol, or making major decisions within 24 hours after anesthesia.

When getting out of bed:

Have someone assist you to prevent falls.

Q23. How soon after an ESD/EMR procedure can a patient return to work, engage in physical activity, or take a shower?

A23:

After an EMR or ESD procedure, patients can usually return to work and resume regular activities within 24 hours. Dietary restrictions may be recommended for the first few days. Shower restrictions might include avoiding strenuous activity and potentially using a gentle cleansing routine.

Here's a more detailed breakdown:

Return to Work:

Most people can return to work the day after the procedure. However, it's important to consider the nature of your job and whether it involves strenuous activities, heavy lifting, or prolonged sitting. If you have a physically demanding job, it's best to consult your doctor before returning to work.

Physical Activity:

While you can generally resume normal activities within 24 hours, it's best to avoid strenuous activity for a few days after the procedure. Rest and recovery are important for proper healing.

Showers:

You can usually shower after a day or two, but it's best to avoid strenuous activity and use a gentle cleansing routine initially. Consult with your doctor for specific recommendations, as they may advise against taking long showers or using hot water for a few days.

Diet:

Some dietary restrictions may be recommended for the first few days, especially if sedation was used. You might need to follow a liquid diet for a day or two while your digestive tract heals.

Follow-up:

You'll likely have a follow-up appointment with your doctor within 12 weeks after the procedure to check on your progress and ensure proper healing.

Q24. What are the follow-up appointments and response methods for postoperative adverse events in ESD/EMR?

A24:

Following ESD or EMR, patients typically have scheduled follow-up appointments to monitor for adverse events. These appointments may include endoscopic evaluations and clinical examinations. In cases of delayed bleeding, additional endoscopic procedures like endoscopic clip placement or suturing may be used to manage the bleeding. If perforation occurs, endoscopic closure or, in severe cases, surgical intervention may be necessary.

Follow-up Appointments:

Endoscopic Evaluations:

A second look-endoscopy may be performed 2-3 days after ESD to check for and address any delayed bleeding.

Clinical Examinations:

Patients are typically instructed to report any symptoms like bleeding, pain, or fever, and may be seen for follow-up appointments as needed.

Longer-term Surveillance:

In some cases, patients undergoing ESD or EMR for early gastric cancer may require longer-term endoscopic surveillance to detect potential recurrences.

Response Methods for Adverse Events:

Delayed Bleeding:

Endoscopic hemostasis with clipping, suturing, or electrocoagulation may be used to stop delayed bleeding.

Perforation:

Endoscopic clipping or suturing can be used for small perforations. Larger perforations may require surgical intervention.

Other Complications:

Specific treatment approaches will vary depending on the nature of the complication. For example, tension pneumoperitoneum (excessive air leakage after perforation) requires prompt percutaneous needle decompression.

General Monitoring:

Patients are often advised to monitor for symptoms like bleeding, pain, or fever after the procedure.

Medications:

Intravenous fluids and antibiotics may be administered during the postprocedure observation period to decrease the risk of complications.

Q25. What is the likelihood of recurrence after an ESD/EMR procedure, and what are the related influencing factors?

A25:

The recurrence rate after an ESD (Endoscopic Submucosal Dissection) or EMR (Endoscopic Mucosal Resection) procedure depends on several factors, including the specific procedure, lesion characteristics, and surgical technique. Generally, EMR has a higher recurrence rate compared to ESD. Recurrence rates after EMR can range from 7.4 to 17%, while ESD recurrence rates are typically around 0.9 to 2% according to one review article.

Factors Influencing Recurrence:

Resection Type:

Piecemeal resections (resecting a lesion in multiple pieces) are a significant risk factor for recurrence, especially for lesions >20 mm, according to one study. En bloc resection (removing the entire lesion in one piece) is associated with lower recurrence rates, particularly with ESD.

Lesion Size:

Larger lesions have a higher risk of recurrence, regardless of the procedure.

Histology:

The presence of villous components or specific histological features may also increase the risk of recurrence.

Incomplete Resection:

Non-R0 resections (where the margins of the removed tissue are not clear) increase the risk of recurrence.

Procedure Type:

EMR typically has higher recurrence rates compared to ESD.

Endoscopic Technique:

Certain techniques, such as using an endoclip, may be associated with higher recurrence rates.

Patient Factors:

Older age, race, and other individual characteristics may also influence recurrence.

Q26. What postoperative signs may indicate incomplete lesion removal or potential recurrence after an ESD/EMR procedure?

A26:

Post-operative signs of potential incomplete lesion removal or recurrence after an ESD/EMR procedure can include bleeding (both immediate and delayed), fever, abdominal pain, and the appearance of a residual or recurrent lesion during follow-up endoscopy. Additionally, scar formation and certain endoscopic features like a nonlifting sign can also be suggestive of incomplete resection.

Detailed Post-operative Signs:

Bleeding:

Immediate Bleeding: Bleeding during the procedure itself, which may require endoscopic hemostasis or lead to a decrease in hemoglobin levels.

Delayed Bleeding: Bleeding occurring after the procedure, such as melena (dark, tarry stool), hematemesis (vomiting blood), or haematochezia (passing bright red

blood in the stool).

Fever and Abdominal Pain:

Fever, especially in the absence of other obvious causes, can indicate complications like perforation or PEECS (perforation after endoscopic submucosal dissection). Abdominal pain can also signal complications like perforation or PEECS.

Nonlifting Sign:

If a lesion doesn't lift properly after submucosal injection, it could indicate submucosal invasion or fibrosis, making it harder to completely resect the lesion.

Residual or Recurrent Lesion:

Residual Disease: A lesion found at the same location where the procedure was performed, often seen in the first or second follow-up endoscopy, particularly after a non-R0 resection (incomplete resection).

Local Recurrence: A new lesion appearing at the same location after a presumed complete resection.

Scarring and Scar Deformity:

Scarring and deformities at the site of resection, especially if associated with other symptoms, may indicate incomplete removal or complications.

Incomplete Mucosal Layer Excision:

Incomplete removal of the mucosal layer during EMR can be a risk factor for recurrence.

Post-procedural Bleeding:

Bleeding rates post-EMR and ESD range from 6 to 15%, with immediate and delayed

bleeding possible.

Perforation:

Perforation is a serious complication with rates ranging from 1 to 2% for EMR and 4 to 16% for ESD.

Strictures:

Scarring in the esophagus can lead to strictures, especially after ESD/EMR in the upper GI tract.

Important Considerations:

Follow-up Endoscopy:

Routine follow-up endoscopy is crucial to monitor for residual or recurrent disease and to identify complications early.

Pathology:

Pathological examination of the resected tissue is necessary to confirm the extent of resection and rule out incomplete removal of the lesion.

Clinical History and Symptoms:

Carefully assessing the patient's symptoms and clinical history can help differentiate between normal post-procedural symptoms and those indicative of complications

Q27. If follow-up after ESD/EMR suggests recurrence, what should be done next?

A27:

If a follow-up endoscopic mucosal resection (EMR) or endoscopic submucosal dissection (ESD) suggests recurrence, the next step depends on the nature and extent of the recurrence. If the recurrence is small and benign, it might be treated with repeat EMR or ESD, or even with other endoscopic therapies like argon plasma coagulation. However, if there's concern about invasive cancer or a higher risk of recurrence, surgical resection (e.g., gastrectomy) might be considered.

Elaboration:

Severity of Recurrence:

The severity of the recurrence, such as the size, location, and histological findings, will influence the next course of action.

Repeat EMR/ESD:

For small, benign recurrences, a repeat EMR or ESD might be a viable option.

Argon Plasma Coagulation:

In some cases, particularly for smaller recurrences, argon plasma coagulation might be used to destroy the recurrence.

Surgical Resection:

If there's concern about invasive cancer or a high risk of recurrence, surgical resection, such as gastrectomy, might be recommended, according to the National Institutes of Health (NIH) (.gov).

Lymph Node Dissection:

If submucosal invasion is identified on pathology, or if there's suspicion of lymph

node metastasis, further evaluation and potentially additional treatment, such as lymph node dissection, should be considered, according to the Clinical Gastroenterology and Hepatology.

Q28. In endoscopic therapy, how are ESD and EMR selected?

A28:

In endoscopic therapy, ESD (Endoscopic Submucosal Dissection) and EMR (Endoscopic Mucosal Resection) are selected based on factors like lesion size, depth of invasion, and potential for submucosal invasion. Generally, smaller lesions and those with a lower risk of submucosal invasion are candidates for EMR, while larger lesions or those with a higher risk of submucosal invasion are often treated with ESD.

Here's a more detailed breakdown:

Factors Influencing the Choice Between EMR and ESD:

Lesion Size:

EMR is generally preferred for smaller lesions (typically up to 2-3 cm in diameter) according to the Annals of Laparoscopic and Endoscopic Surgery. ESD is more appropriate for larger lesions, especially those exceeding 2-3 cm in diameter.

Depth of Invasion:

ESD is often preferred for lesions with suspected or proven submucosal invasion, as it allows for deeper tissue removal.

Paris Classification:

The Paris classification system is used to classify lesions based on their appearance, and this classification can help guide the choice of EMR or ESD.

Type of Lesion:

For certain types of lesions, such as those with a high risk of recurrence or those that are difficult to lift for EMR, ESD may be preferred.

Operator Expertise:

The expertise of the endoscopist can also influence the choice of technique, as ESD can be more technically challenging than EMR.

In Summary:

EMR:

Primarily used for smaller, less aggressive lesions where en bloc resection is feasible.

ESD:

Used for larger, more aggressive lesions, particularly those with suspected or proven submucosal invasion, where deeper tissue dissection is necessary.

Q29. What is the typical cost of an ESD/EMR procedure, and how is it covered by medical insurance?

A29:

The cost of an ESD/EMR procedure can vary significantly, but generally, EMR is

less expensive than ESD. In the US, the average cost for ESD, including the endoscopy, mucosal closure, and procedure, is around $3,649, with some insurance companies averaging around $3,562, according to Boston Scientific. Medical insurance typically covers a portion of these costs, but it's important to check your specific plan for details.

Cost Breakdown and Factors:

ESD:

The average cost of ESD can be in the range of $3,649 to $5,927 USD. This includes costs for the procedure itself, endoscopy or colonoscopy, and mucosal closure.

EMR:

EMR procedures are generally less expensive than ESD, with costs potentially ranging from $3,070 to $5,927 USD, depending on factors like hospital and insurance coverage, according to Wiley Online Library and PACE Hospitals.

Hospitalization Costs:

ESD/EMR procedures are usually performed as outpatient procedures, meaning the patient does not require a hospital stay. However, some plans may include facility fees.

Other Factors:

The cost can also vary based on the complexity of the procedure, the location of the hospital, and whether it's a private or public hospital.

Insurance Coverage:

General Coverage:

Medical insurance typically covers a portion of the costs associated with ESD/EMR procedures, as they are considered medically necessary treatments for certain conditions like precancerous and cancerous areas in the GI tract.

Co-pays and Deductibles:

You may still be responsible for co-pays, deductibles, or a percentage of the total cost, depending on your insurance plan.

Prior Authorization:

Some insurance plans require prior authorization for ESD/EMR procedures, which means you may need to get approval from your insurance company before the procedure can be performed.

Network vs. Out-of-Network:

If your procedure is performed at an in-network hospital, your costs will likely be lower compared to an out-of-network facility.

Specific Coverage Details:

The exact amount covered will depend on the details of your specific medical insurance plan. It's essential to contact your insurance provider to understand your coverage for ESD/EMR procedures and what your out-of-pocket costs will be.

Additional Considerations:

Comparison with Surgery:

ESD/EMR procedures are often considered cost-effective alternatives to surgery for certain conditions, as they are minimally invasive and have lower overall costs.

Cost Analysis:

Studies have shown that ESD/EMR can lead to significant cost savings compared to surgical management, particularly in terms of hospital stays and other healthcare expenses.

HCPCS Codes:

HCPCS (Healthcare Common Procedure Coding System) codes are used to classify medical procedures, and C9779 is the code for ESD, according to the AAPC.

Q30. How can the psychological state of patients be managed after an ESD/EMR procedure to reduce anxiety and concerns?

A30:

Psychological adjustment and anxiety reduction after Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR) should focus on the following key aspects:

1. Understanding and accepting the postoperative condition:

Patients may experience some discomfort after the procedure, such as abdominal pain or bloating, which should be understood and accepted as part of the healing process.

Follow-up examinations are necessary to assess treatment outcomes and rule out complications.

Patients should carefully follow the doctor's postoperative instructions and comply with all medical recommendations.

2. Reducing anxiety and fear:

Before surgery, patients may feel anxious about possible complications or disease recurrence.

After surgery, concerns about recovery progress may arise. These fears need to be acknowledged and alleviated.

Sharing successful recovery cases and experiences from other patients can help build confidence and ease anxiety.

3. Supporting postoperative recovery:

Postoperative care should include appropriate dietary management, avoiding irritating foods.

Moderate physical activity is beneficial, but overexertion must be avoided.

Maintaining a positive mindset and optimistic attitude contributes significantly to recovery.

4. Building a support system:

Patients may benefit from joining support groups where they can share experiences and gain encouragement.

Seeking psychological counseling can help manage emotional stress during recovery.

Family members and friends should also offer support and motivation throughout the healing process.

5. Regular follow-up and ongoing monitoring:

Scheduled follow-up visits enable physicians to evaluate therapeutic results and address potential problems promptly.

Ongoing monitoring helps patients understand their condition and develop healthy dietary and lifestyle habits.

Participation in community health education activities can further enhance patients' health awareness.

In summary, psychological adjustment after ESD/EMR is a long-term process requiring the joint efforts of patients, healthcare providers, family, and friends. Maintaining a positive and cooperative attitude and actively participating in recovery are essential for restoring health successfully.

Q, Question; A, Answer

Supplementary Table 4. Kendall's coefficient of concordance among experts.

Subject	Coefficient of consistency	*P value*
Accuracy	0.538	0.002
Completeness	0.602	<0.001
Comprehensibility	0.617	<0.001

Supplementary Table 5. The coefficients of variation for expert-assigned Likert scale scores on ChatGPT-generated questions.

Question	Parameter	Coefficient of variation
Q1	Accuracy	0.11
	Completeness	0
	Comprehensibility	0
RQ1	Accuracy	0.11
	Completeness	0
	Comprehensibility	0
Q2	Accuracy	0
	Completeness	0
	Comprehensibility	0
RQ2	Accuracy	0.13
	Completeness	0.25
	Comprehensibility	0
Q3	Accuracy	0.12
	Completeness	0
	Comprehensibility	0
RQ3	Accuracy	0
	Completeness	0.22
	Comprehensibility	0
Q4	Accuracy	0.11

	Completeness	0
	Comprehensibility	0
RQ4	Accuracy	0.11
	Completeness	0
	Comprehensibility	0
Q5	Accuracy	0.10
	Completeness	0.25
	Comprehensibility	0
RQ5	Accuracy	0.10
	Completeness	0
	Comprehensibility	0
Q6	Accuracy	0
	Completeness	0
	Comprehensibility	0
RQ6	Accuracy	0
	Completeness	0.25
	Comprehensibility	0
Q7	Accuracy	0.13
	Completeness	0
	Comprehensibility	0.25
RQ7	Accuracy	0.13
	Completeness	0

	Comprehensibility	0.25
Q8	Accuracy	0
	Completeness	0
	Comprehensibility	0
RQ8	Accuracy	0
	Completeness	0
	Comprehensibility	0
Q9	Accuracy	0
	Completeness	0.25
	Comprehensibility	0
RQ9	Accuracy	0
	Completeness	0.25
	Comprehensibility	0
Q10	Accuracy	0.10
	Completeness	0
	Comprehensibility	0
RQ10	Accuracy	0.10
	Completeness	0
	Comprehensibility	0
Q11	Accuracy	0.11
	Completeness	0.25
	Comprehensibility	0

RQ11	Accuracy	0.10
	Completeness	0.25
	Comprehensibility	0
Q12	Accuracy	0.10
	Completeness	0.22
	Comprehensibility	0
RQ12	Accuracy	0.10
	Completeness	0.22
	Comprehensibility	0
Q13	Accuracy	0
	Completeness	0
	Comprehensibility	0
RQ13	Accuracy	0
	Completeness	0
	Comprehensibility	0
Q14	Accuracy	0.11
	Completeness	0.22
	Comprehensibility	0.22
RQ14	Accuracy	0
	Completeness	0.22
	Comprehensibility	0
Q15	Accuracy	0

	Completeness	0.22
	Comprehensibility	0
RQ15	Accuracy	0.11
	Completeness	0.22
	Comprehensibility	0
Q16	Accuracy	0
	Completeness	0.25
	Comprehensibility	0
RQ16	Accuracy	0.10
	Completeness	0
	Comprehensibility	0
Q17	Accuracy	0
	Completeness	0.25
	Comprehensibility	0
RQ17	Accuracy	0
	Completeness	0.22
	Comprehensibility	0
Q18	Accuracy	0.10
	Completeness	0
	Comprehensibility	0
RQ18	Accuracy	0.11
	Completeness	0

	Comprehensibility	0
Q19	Accuracy	0.10
	Completeness	0
	Comprehensibility	0
RQ19	Accuracy	0.10
	Completeness	0
	Comprehensibility	0
Q20	Accuracy	0
	Completeness	0.22
	Comprehensibility	0
RQ20	Accuracy	0.11
	Completeness	0
	Comprehensibility	0
Q21	Accuracy	0
	Completeness	0.25
	Comprehensibility	0
RQ21	Accuracy	0.11
	Completeness	0.25
	Comprehensibility	0
Q22	Accuracy	0
	Completeness	0
	Comprehensibility	0

RQ22	Accuracy	0.11
	Completeness	0
	Comprehensibility	0
Q23	Accuracy	0
	Completeness	0
	Comprehensibility	0
RQ23	Accuracy	0
	Completeness	0
	Comprehensibility	0
Q24	Accuracy	0
	Completeness	0
	Comprehensibility	0.25
RQ24	Accuracy	0.11
	Completeness	0.25
	Comprehensibility	0
Q25	Accuracy	0
	Completeness	0
	Comprehensibility	0
RQ25	Accuracy	0
	Completeness	0
	Comprehensibility	0
Q26	Accuracy	0.11

	Completeness	0
	Comprehensibility	0
RQ26	Accuracy	0.11
	Completeness	0
	Comprehensibility	0
Q27	Accuracy	0
	Completeness	0.25
	Comprehensibility	0
RQ27	Accuracy	0
	Completeness	0
	Comprehensibility	0
Q28	Accuracy	0.20
	Completeness	0
	Comprehensibility	0
RQ28	Accuracy	0.11
	Completeness	0.25
	Comprehensibility	0
Q29	Accuracy	0.13
	Completeness	0
	Comprehensibility	0
RQ29	Accuracy	0.13
	Completeness	0.25

	Comprehensibility	0
Q30	Accuracy	0.11
	Completeness	0.22
	Comprehensibility	0
RQ30	Accuracy	0.10
	Completeness	0
	Comprehensibility	0

Q, Question; RQ, Replication Question

Supplementary Table 6. Binary categories ratings of questions generated by ChatGPT and Google.

		ChatGPT		Google	
Question	Parameter	Number of high scorers	Number of low scorers	Number of high scorers	Number of low scorers
Q1	Accuracy	3	0	2	1
	Completeness	3	0	2	1
	Comprehensibility	3	0	3	0
RQ1	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q2	Accuracy	1	2	1	2
	Completeness	2	1	1	2
	Comprehensibility	3	0	3	0
RQ2	Accuracy	1	2		
	Completeness	3	0		
	Comprehensibility	3	0		
Q3	Accuracy	2	1	2	1
	Completeness	3	0	2	1
	Comprehensibility	3	0	3	0
RQ3	Accuracy	3	0		
	Completeness	3	0		

	Comprehensibility	3	0		
Q4	Accuracy	3	0	2	1
	Completeness	3	0	1	2
	Comprehensibility	3	0	3	0
RQ4	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q5	Accuracy	3	0	3	0
	Completeness	3	0	3	0
	Comprehensibility	3	0	3	0
RQ5	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q6	Accuracy	3	0	1	2
	Completeness	3	0	2	1
	Comprehensibility	3	0	3	0
RQ6	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q7	Accuracy	1	2	0	3
	Completeness	2	1	2	1
	Comprehensibility	3	0	3	0

RQ7	Accuracy	1	2		
	Completeness	2	1		
	Comprehensibility	3	0		
Q8	Accuracy	3	0	3	0
	Completeness	3	0	3	0
	Comprehensibility	3	0	3	0
RQ8	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q9	Accuracy	3	0	1	2
	Completeness	3	0	1	2
	Comprehensibility	3	0	3	0
RQ9	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q10	Accuracy	3	0	3	0
	Completeness	3	0	3	0
	Comprehensibility	3	0	3	0
RQ10	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q11	Accuracy	3	0	2	1

	Completeness	3	0	1	2
	Comprehensibility	3	0	3	0
RQ11	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q12	Accuracy	3	0	1	2
	Completeness	3	0	1	2
	Comprehensibility	3	0	3	0
RQ12	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q13	Accuracy	3	0	2	1
	Completeness	3	0	1	2
	Comprehensibility	3	0	3	0
RQ13	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q14	Accuracy	3	0	3	0
	Completeness	3	0	1	2
	Comprehensibility	3	0	3	0
RQ14	Accuracy	3	0		
	Completeness	3	0		

	Comprehensibility	3	0		
Q15	Accuracy	3	0	3	0
	Completeness	3	0	2	1
	Comprehensibility	3	0	3	0
RQ15	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q16	Accuracy	3	0	3	0
	Completeness	3	0	3	0
	Comprehensibility	3	0	3	0
RQ16	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q17	Accuracy	3	0	2	1
	Completeness	3	0	2	1
	Comprehensibility	3	0	3	0
RQ17	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q18	Accuracy	3	0	3	0
	Completeness	3	0	3	0
	Comprehensibility	3	0	3	0

RQ18	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q19	Accuracy	3	0	3	0
	Completeness	3	0	3	0
	Comprehensibility	3	0	3	0
RQ19	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q20	Accuracy	3	0	3	0
	Completeness	3	0	3	0
	Comprehensibility	3	0	3	0
RQ20	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q21	Accuracy	3	0	2	1
	Completeness	3	0	2	1
	Comprehensibility	3	0	3	0
RQ21	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q22	Accuracy	3	0	3	0

	Completeness	3	0	3	0
	Comprehensibility	3	0	3	0
RQ22	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q23	Accuracy	3	0	3	0
	Completeness	3	0	3	0
	Comprehensibility	3	0	3	0
RQ23	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q24	Accuracy	3	0	1	2
	Completeness	3	0	1	2
	Comprehensibility	3	0	3	0
RQ24	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q25	Accuracy	3	0	3	0
	Completeness	3	0	2	1
	Comprehensibility	3	0	3	0
RQ25	Accuracy	3	0		
	Completeness	3	0		

	Comprehensibility	3	0		
Q26	Accuracy	3	0	0	3
	Completeness	3	0	0	3
	Comprehensibility	3	0	3	0
RQ26	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q27	Accuracy	3	0	0	3
	Completeness	3	0	0	3
	Comprehensibility	3	0	3	0
RQ27	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q28	Accuracy	2	1	2	1
	Completeness	3	0	2	1
	Comprehensibility	3	0	3	0
RQ28	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		
Q29	Accuracy	1	2	2	1
	Completeness	3	0	3	0
	Comprehensibility	3	0	3	0

RQ29	Accuracy	1	2		
	Completeness	3	0		
	Comprehensibility	3	0		
Q30	Accuracy	3	0	3	0
	Completeness	3	0	3	0
	Comprehensibility	3	0	3	0
RQ30	Accuracy	3	0		
	Completeness	3	0		
	Comprehensibility	3	0		

ChatGPT, Chat Generative Pretrained Transformer; Q, Question; RQ, Replication Question

Supplementary Table 7. Non-experts and patients' Likert-scale comprehensibility ratings of questions generated by ChatGPT.

	Non-experts		Patients	
Question	Number of high scorers	Number of low scorers	Number of high scorers	Number of low scorers
Q1	3	0	3	0
RQ1	3	0	3	0
Q2	3	0	2	1
RQ2	3	0	2	1
Q3	3	0	3	0
RQ3	3	0	3	0
Q4	3	0	3	0
RQ4	3	0	3	0
Q5	3	0	3	0
RQ5	3	0	3	0
Q6	3	0	3	0
RQ6	3	0	3	0
Q7	3	0	3	0
RQ7	3	0	3	0
Q8	3	0	3	0
RQ8	3	0	3	0
Q9	3	0	3	0

RQ9	3	0	3	0
Q10	3	0	3	0
RQ10	3	0	3	0
Q11	3	0	3	0
RQ11	3	0	3	0
Q12	3	0	3	0
RQ12	3	0	3	0
Q13	3	0	2	1
RQ13	3	0	2	1
Q14	3	0	3	0
RQ14	3	0	3	0
Q15	3	0	3	0
RQ15	3	0	3	0
Q16	3	0	3	0
RQ16	3	0	3	0
Q17	3	0	3	0
RQ17	3	0	3	0
Q18	3	0	3	0
RQ18	3	0	3	0
Q19	3	0	3	0
RQ19	3	0	3	0
Q20	3	0	3	0

RQ20	3	0	3	0
Q21	3	0	3	0
RQ21	3	0	3	0
Q22	3	0	3	0
RQ22	3	0	3	0
Q23	3	0	3	0
RQ23	3	0	3	0
Q24	3	0	3	0
RQ24	3	0	3	0
Q25	3	0	3	0
RQ25	3	0	3	0
Q26	3	0	2	1
RQ26	3	0	2	1
Q27	3	0	3	0
RQ27	3	0	3	0
Q28	3	0	3	0
RQ28	3	0	3	0
Q29	3	0	2	1
RQ29	3	0	2	1
Q30	3	0	3	0
RQ30	3	0	3	0

Q, Question; RQ, Replication Question