Endoscopic Management of Early Gastric Cancer

Dr Swe Mon Mya
Senior Consultant Gastroenterologist
Department of Gastroenterology
Yangon General Hospital
25.2.2024

*outline

* Definition

* Classification

* Diagnosis

  -Endoscopic-White light, Image Enhanced Endoscopy

*Endoscopic resection

*Definition

* Gastric cancer occurring in the gastric mucosa and confined to the mucosa or submucosa irrespective of lymph node metastasis

* Definitive diagnosis of EGC is still based on the gold standard histopathological examination

* Endoscopic technologies --continuously advancing throughout the years

* Techniques commonly used----

  -white light endoscopy,

  -magnifying endoscopy with narrow-band imaging (NBI), and

  -chromoendoscopy

* Endoscopic diagnosis of early gastric cancer mainly comprises two steps:

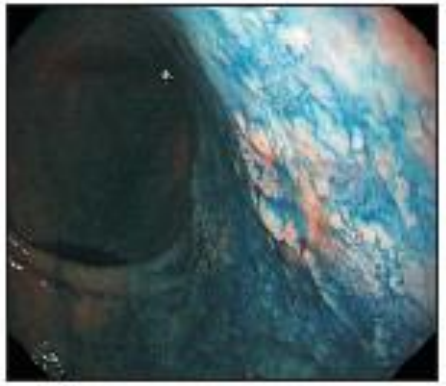
-(I) detection of cancer and

-(II) differentiation between cancerous and non-cancerous lesions

Systematic endoscopic approach of Early Gastric Cancer

Step 1 Presence diagnosis	Step 2 Qualitative diagnosis	Step 3 Quantitative diagnosis
· Non-cancer	· Differentiated type	· Horizontal margin
· Cancer	· Undifferentiated type	· Depth of invasion





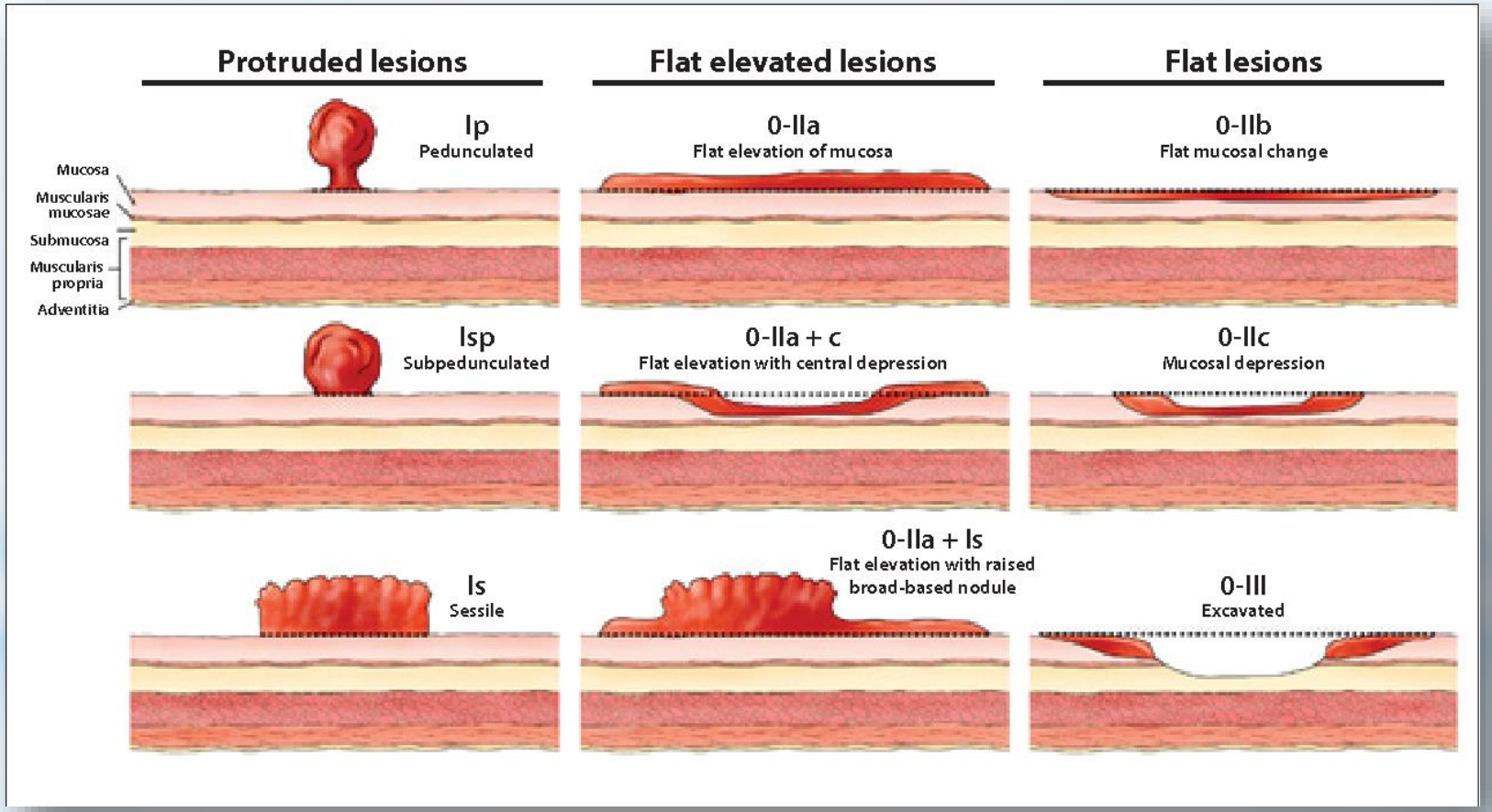
*Classification of EGC

* Japanese macroscopic classification

Classification	Description
Type 0 (Superficial)	Superficial lesions involving only the mucosa and the submucosa
Type 1 (Mass)	Polypoid lesions attached to a wide base, with sharp demarcation from surrounding mucosa
Type 2 (Ulcerative)	Ulcerated lesions with raised margins and demarcation line
Type 3 (Infiltrative ulcerative)	Ulcerative infiltrating lesions without clear and definite margins
Type 4 (Diffuse infiltrative)	Nonulcerative diffusely infiltrating lesions without clear and definite margins
Type 5 (Unclassifiable)	Advanced carcinomas that cannot be classified into any of the above types

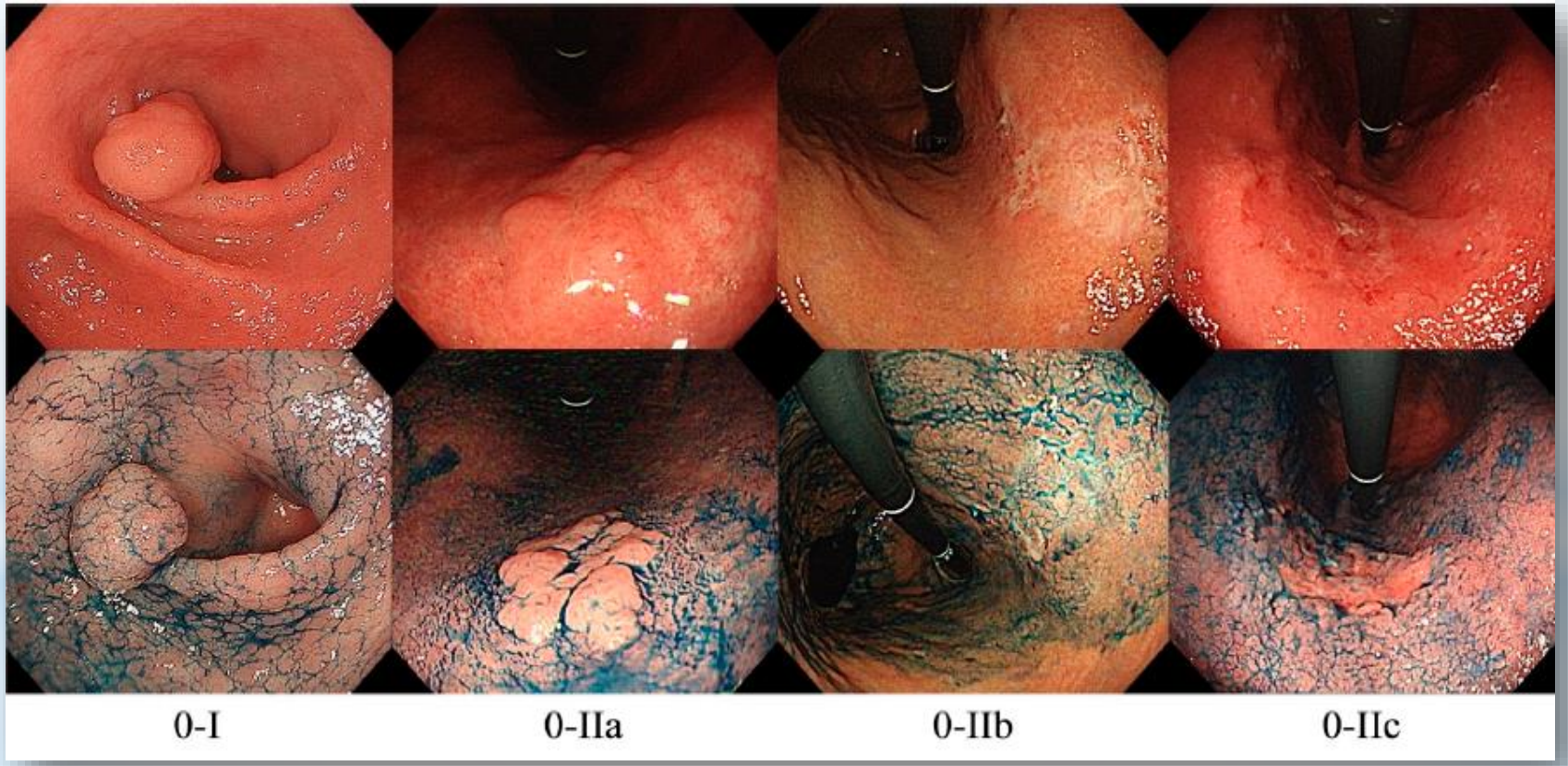
Classification of EGC

- Paris classification



*Classification of EGC

*Paris classification



* Basic principles for detecting EGC using conventional endoscopy

Technique

Ideal preparation

* Thirty minutes before the procedure, drink a mixture of water with mucolytic and defoaming agents

* The formula in Japan is 100 mL of water with 20000 U pronase ,1 g of sodium bicarbonate, and 10 mL of Dimethylpolysiloxane (20 mg/mL)

* An alternative mixture comprises 100 mL of water mixed with 2 mL of acetylcysteine and 0.5 mL (40 mg/mL) activated dimethicone

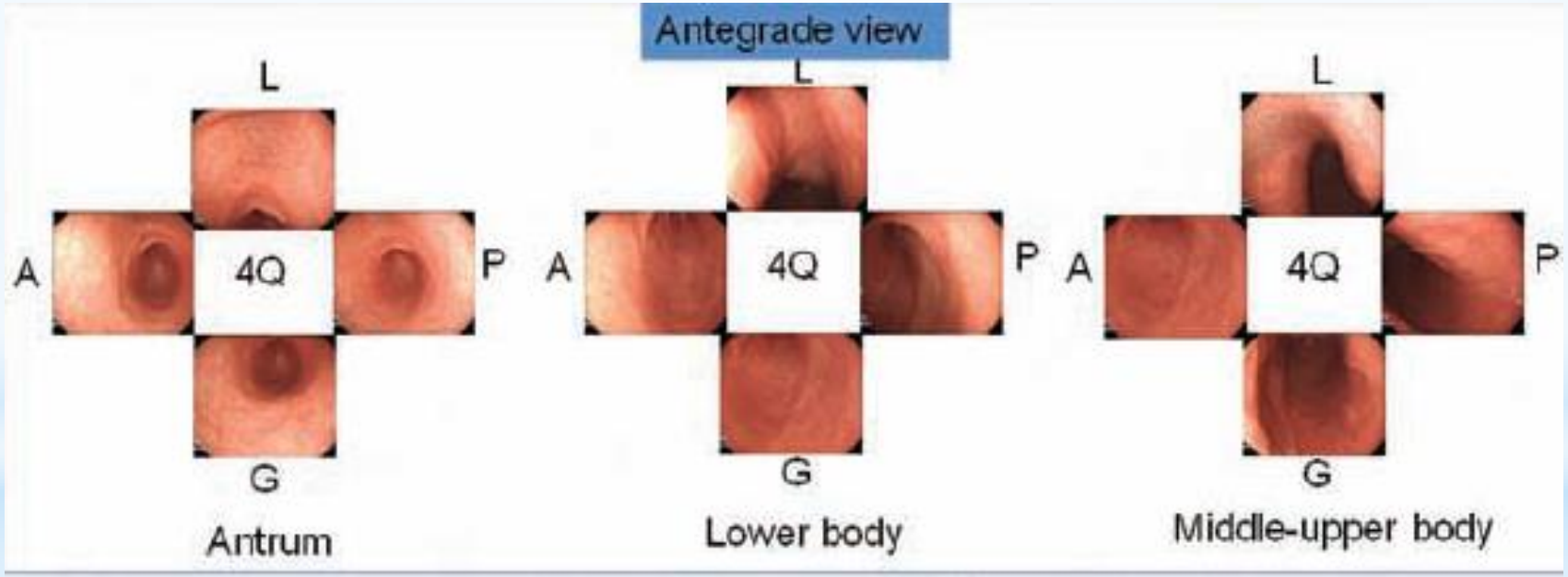
* Basic principles for detecting EGC using conventional endoscopy

Use of an antiperistaltic agent

* 10-20mg of buscopan or 1mg glucagon

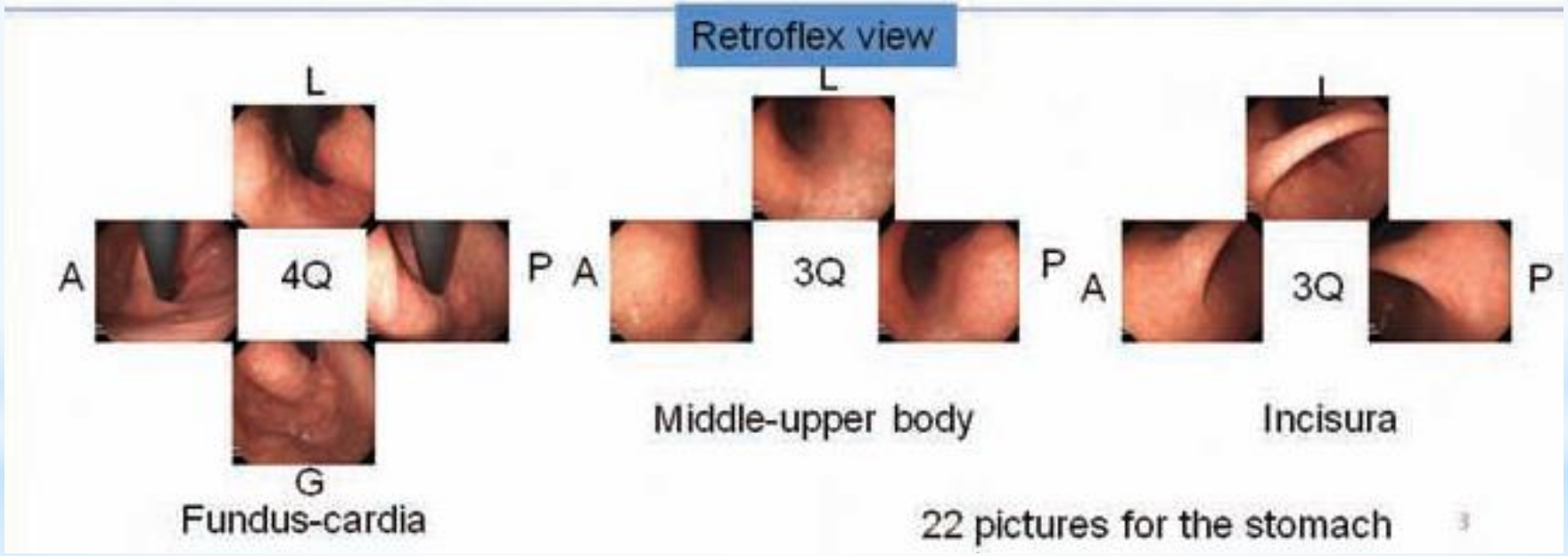
* Basic principles for detecting EGC using conventional endoscopy

Avoiding blind spots: systematic screening protocol for the stomach (SSS)



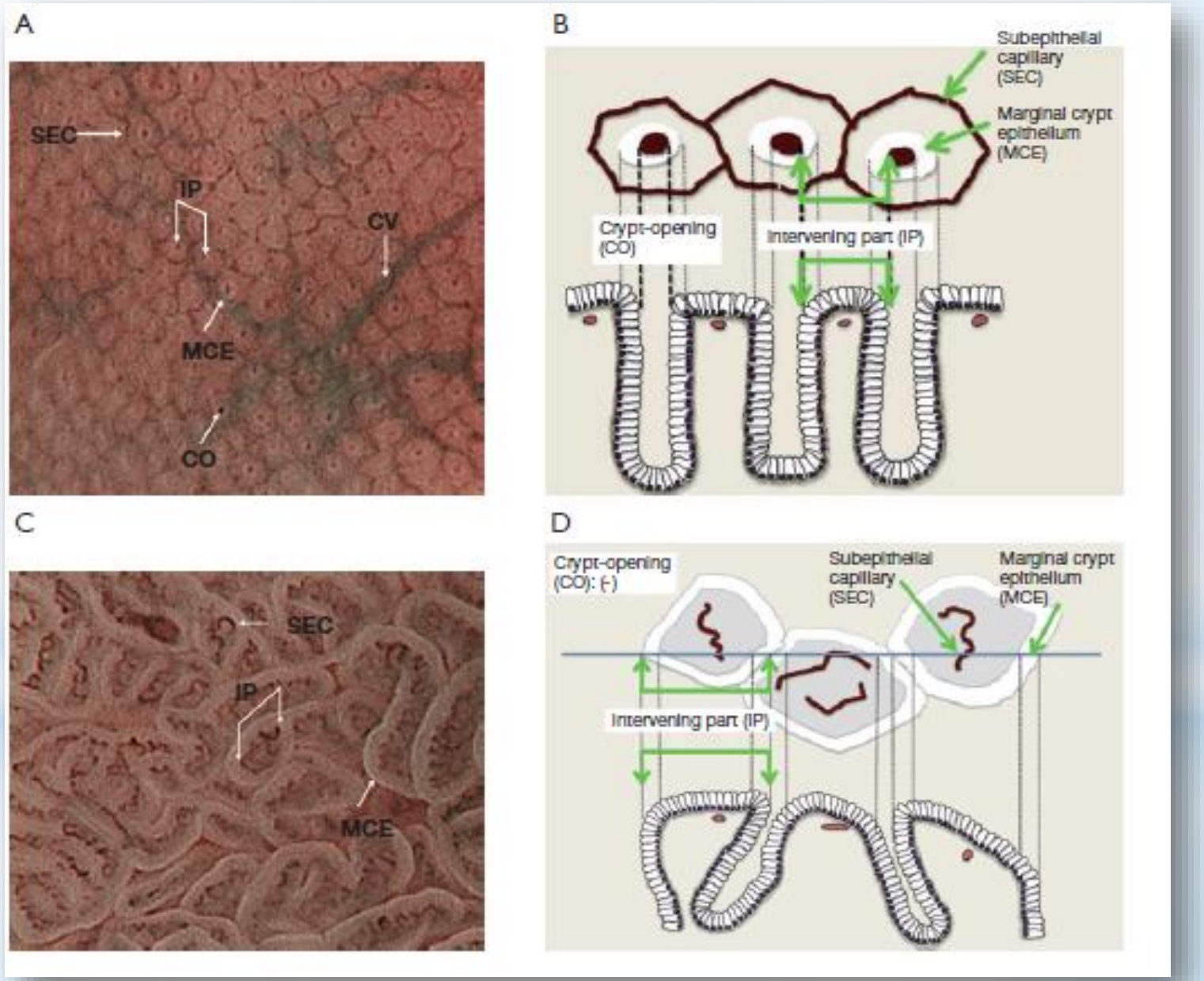
* Basic principles for detecting EGC using conventional endoscopy

Avoiding blind spots: systematic screening protocol for the stomach (SSS)



* *M-NBI technique using a soft black hood attachment*

* Basic principles for detecting EGC



* Basic principles for characterization of detected lesions

* Differentiate between cancerous and non-cancerous lesions (characterization)

* For characterization, two distinct markers, namely color and surface morphology

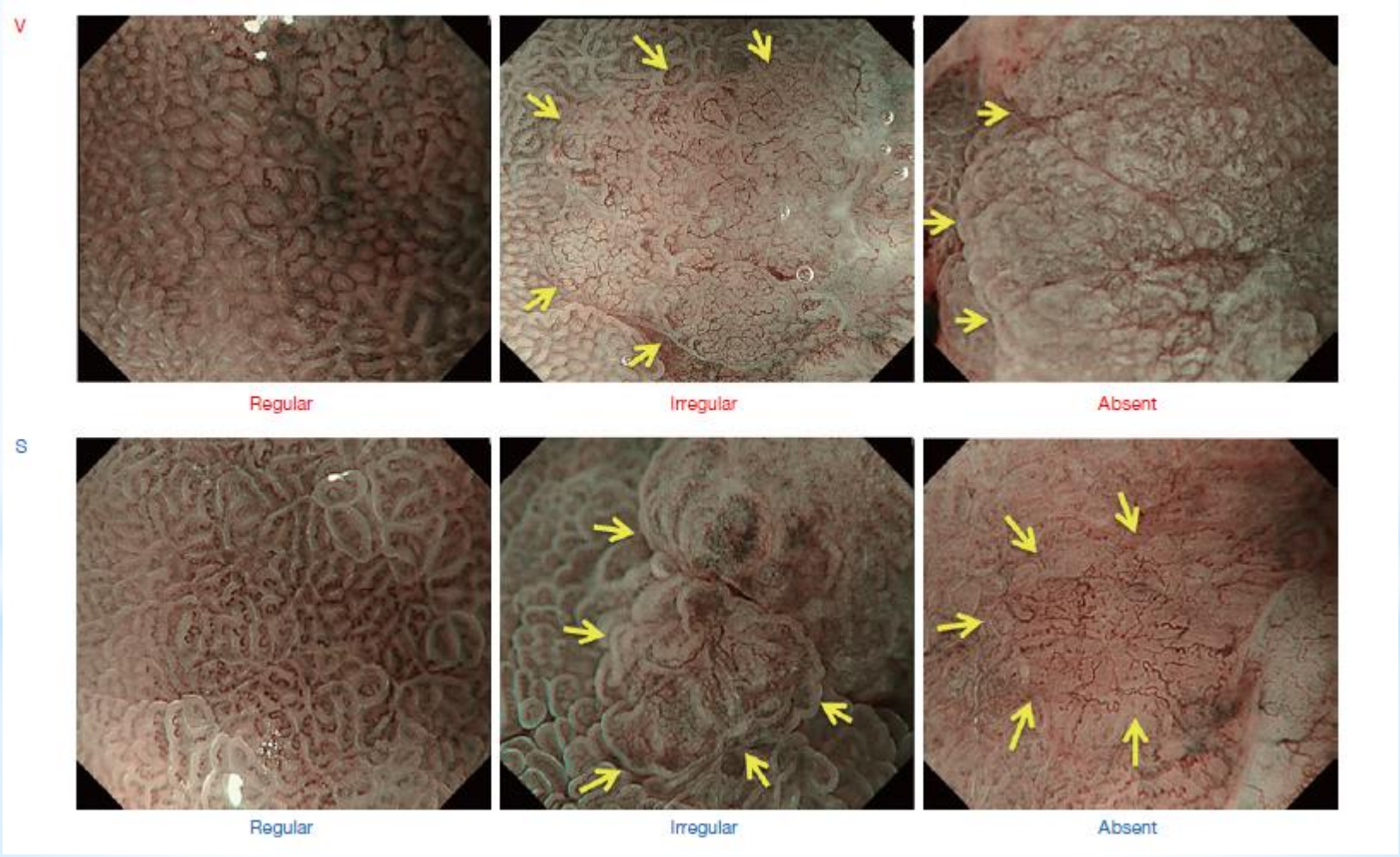
* CE using indigo carmine is useful in enhancing the surface pattern

* 1) Well-demarcated border. 2) Irregularity in color/surface pattern

* difficult to correctly diagnose minute gastric cancers (≤5 mm) or superficial flat (0 IIb) gastric cancers using C-WLI or CE,

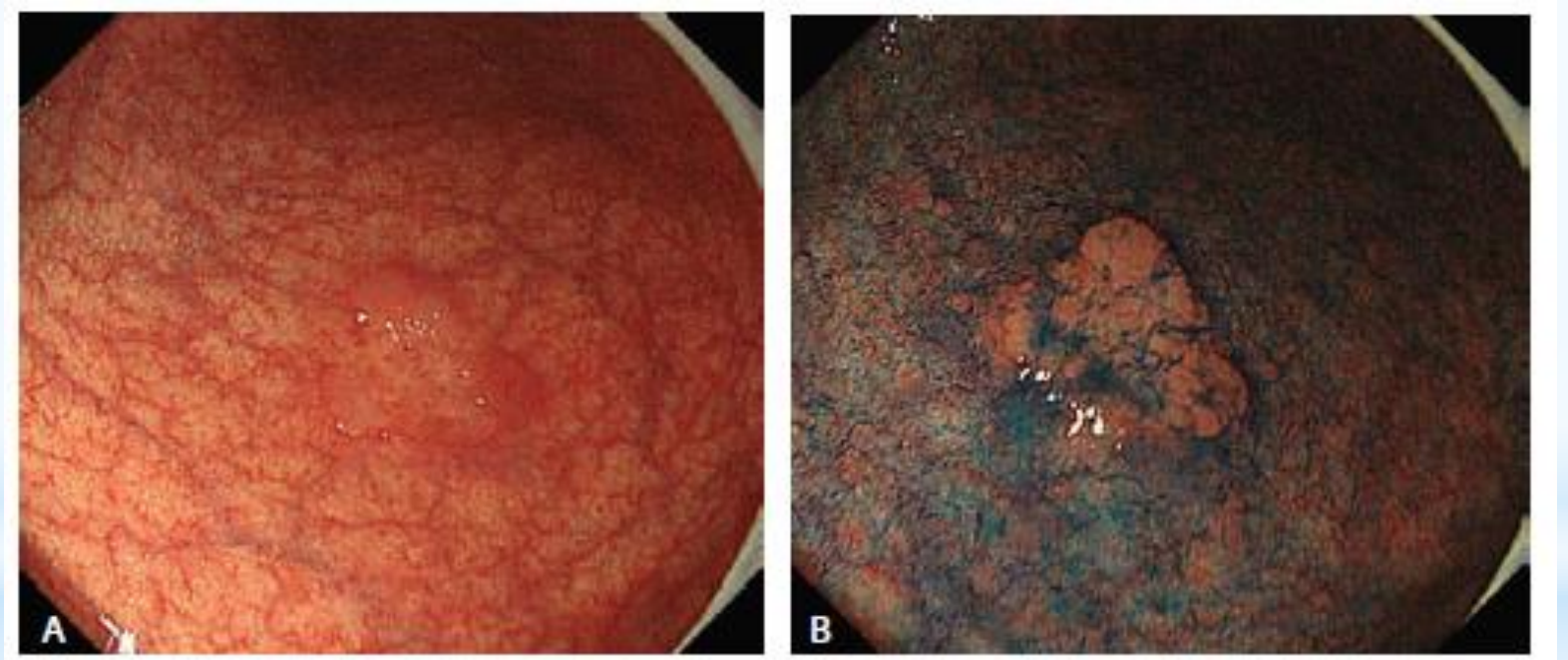
* Characterization using magnifying endoscopy with narrow-band imaging (M-NBI)

* The “VS(vessel plus surface) classification system



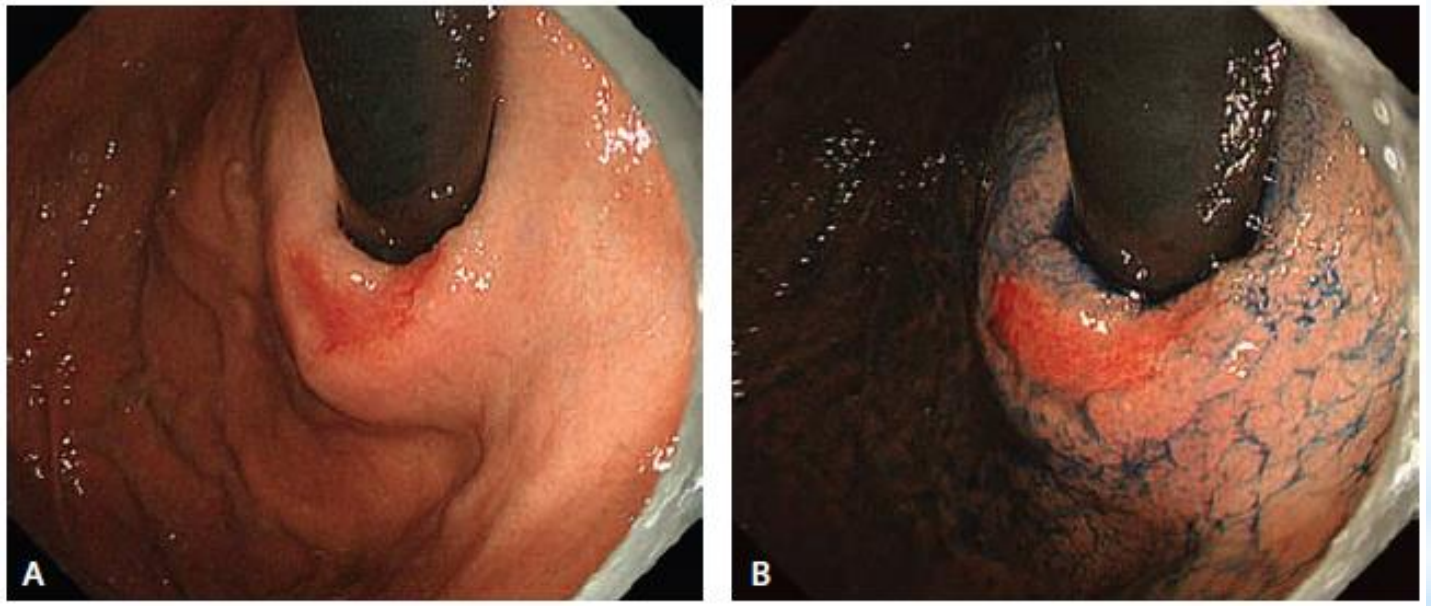
Characterization using Chromoendoscopy

* superficial elevated (0 IIa) type early gastric cancer in the gastric antrum



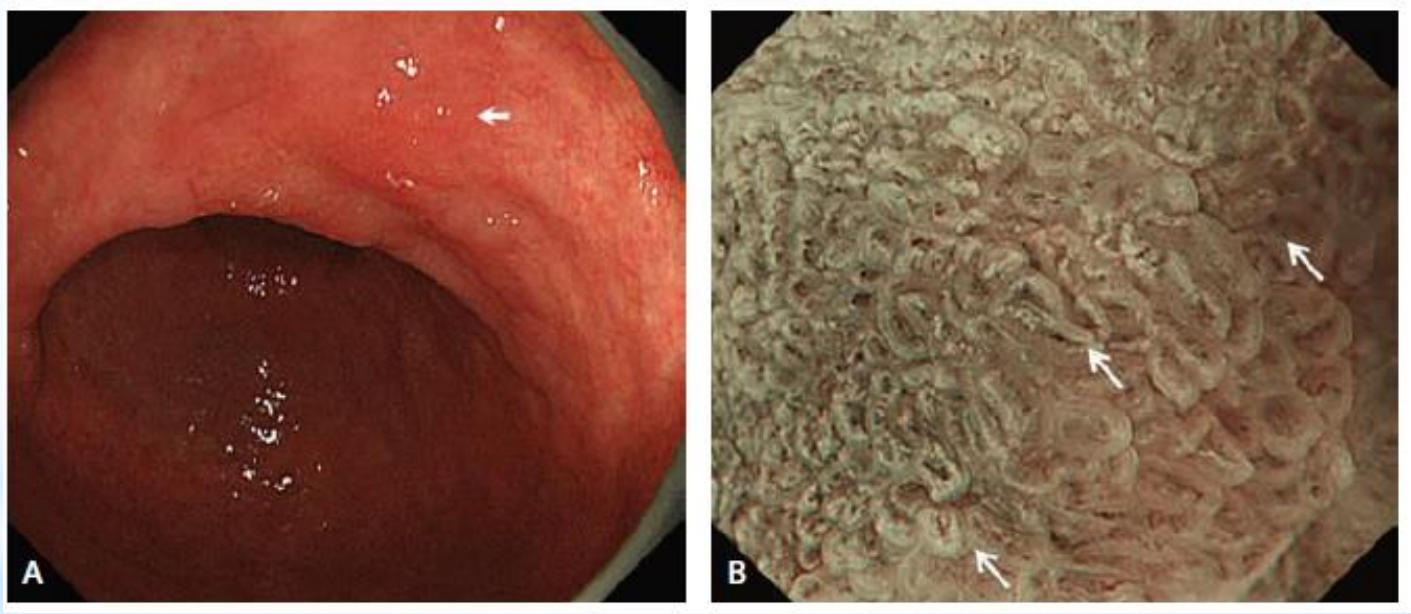
* Characterization using Chromoendoscopy

* superficial depressed (0 IIc) type early gastric cancer in the gastric cardia



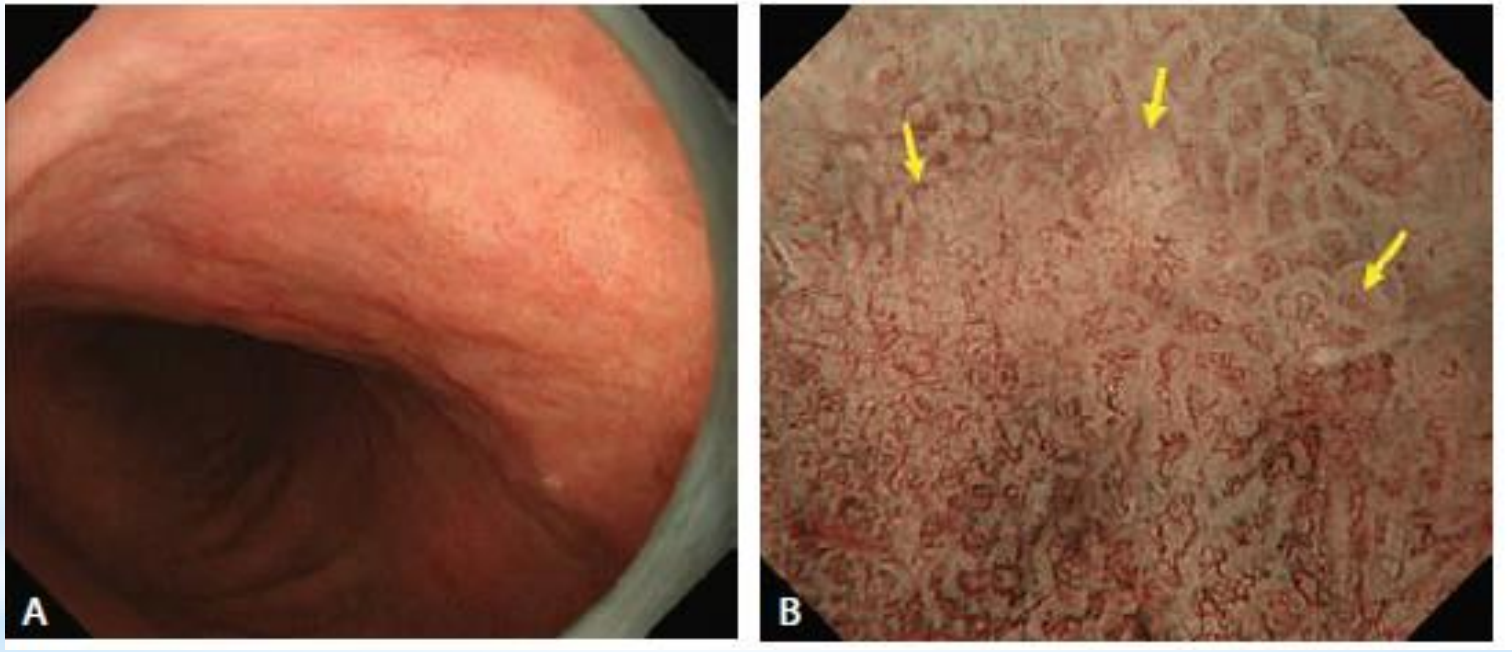
Characterization using magnifying endoscopy with narrow-band imaging (M-NBI)

* A superficial elevated lesion at the gastric lower body (well-differentiated adenocarcinoma)



Characterization using magnifying endoscopy with narrow-band imaging (M-NBI)

* An early gastric cancer of superficial flat type



* QULATATIVE DIAGNOSIS OF EGC

*Prediction of histological type

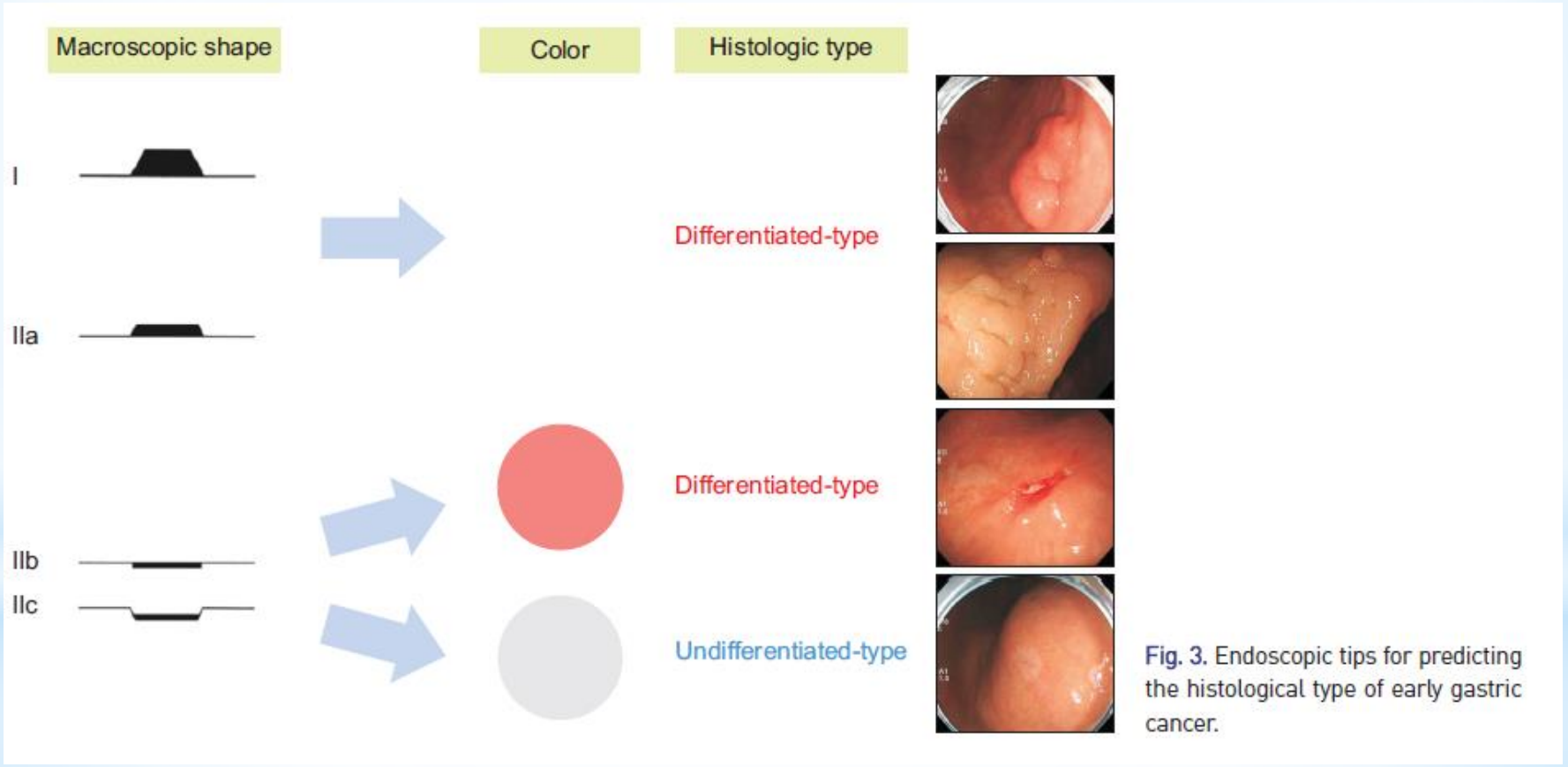


Fig. 3. Endoscopic tips for predicting the histological type of early gastric cancer.

* QUANTITATIVE DIAGNOSIS OF EGC

*1. Depth of invasion

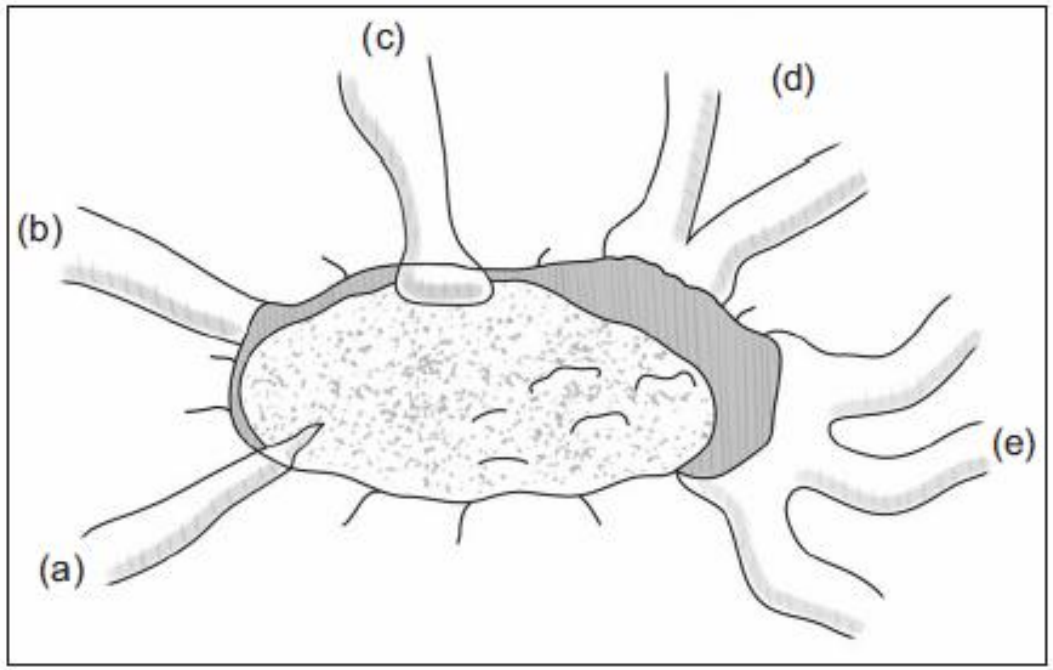


Fig. 4. Morphological changes in the tip of folds in depressed-type cancers. (a) Tapering. (b) Abrupt cutting. (c) Clubbing. (d) Fusion. (e) Bank-like elevation. (a) and (b) suggest mucosal cancer, (c) and (d) suggest submucosal cancer, and (e) suggests advanced cancer.

* QUANTITATIVE DIAGNOSIS OF EGC

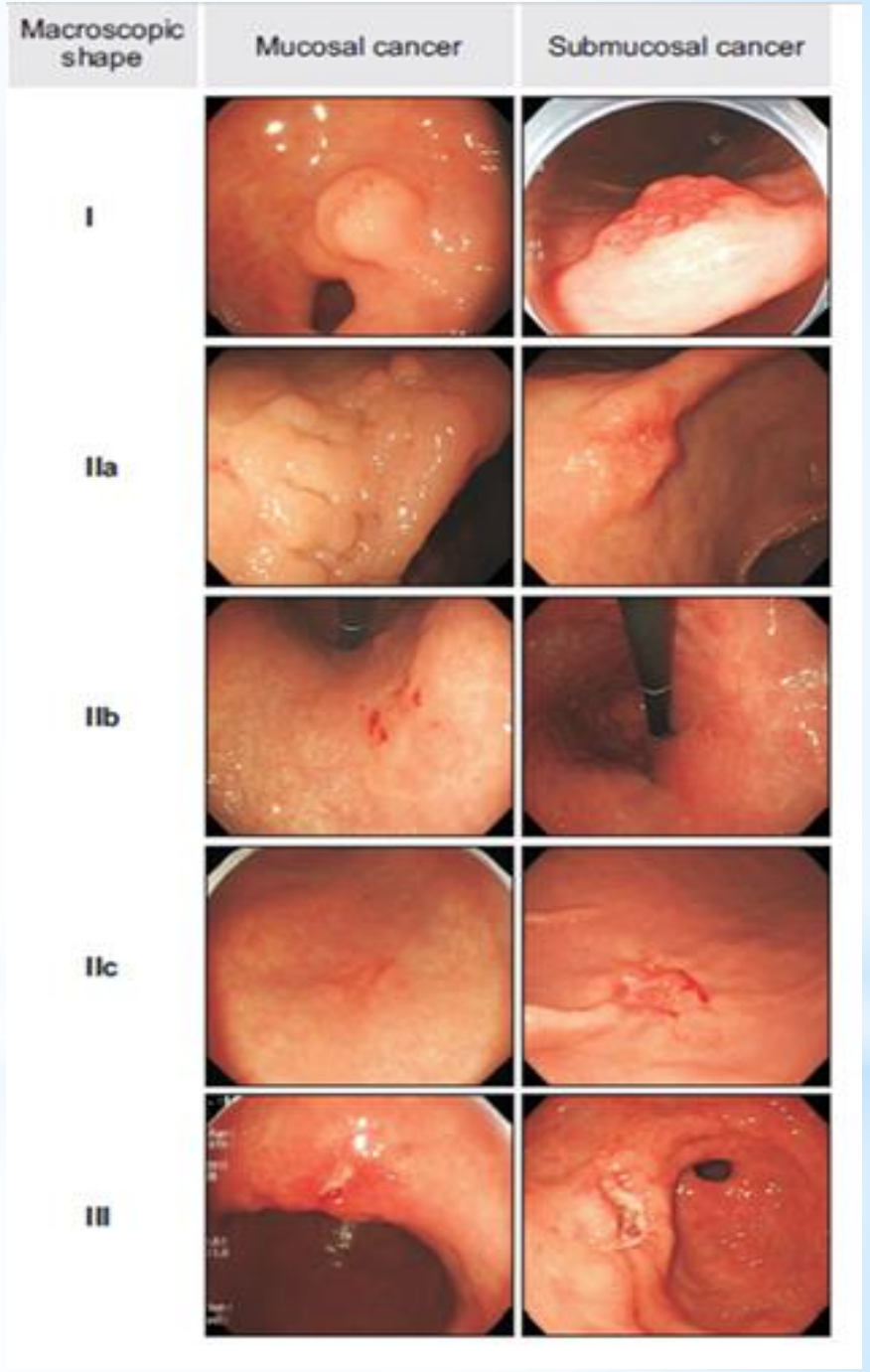
*1. Depth of invasion

Macroscopic shape	Suggesting mucosal cancer	Suggesting submucosal cancer
I	· ≤2 cm · Pedunculated	· >2 cm · Sessile · Uneven surface with nodules · Deep depression · Subepithelial tumor-like elevation
IIa	· ≤2 cm · Steep elevation	· >2 cm · Strong redness · Uneven surface with erosions · Deep depression · Nodular elevation
IIb	▶ Almost all cases are mucosal cancer	
IIc		
Ulceration (–)	· ≤2 cm · Shallow depression · Smooth surface · Minute nodules	· >2 cm · Strong redness · Deep depression · Loss of mucosal surface pattern · Large nodules · Subepithelial tumor-like elevation · Hardness during air inflation
Ulceration (+)	· Tapering of a fold tip · Abrupt cutting of a fold	· Clubbing of a fold · Fusion of folds · Hardness during air inflation
III	▶ Difficult to estimate the depth of invasion due to accompanying edema	

*QUANTITATIVE DIAGNOSIS OF EGC

1. Depth of invasion

- mucosal cancer
  - -surface structure is uniform and -
  - -no ulceration in an elevated lesion
- deep sub mucosal invasion
  - -tumor size >30 mm,
  - -remarkable redness,
  - -uneven surface, and
  - -margin elevation (57.3%, 86.2%, and 91.1%)



QUANTITATIVE DIAGNOSIS OF EGC

1.Depth of invasion

EUS

* Accuracy of EUS in evaluating ECG invasion depth with a high grade of variability and an accuracy rate between 64.8% and 92%

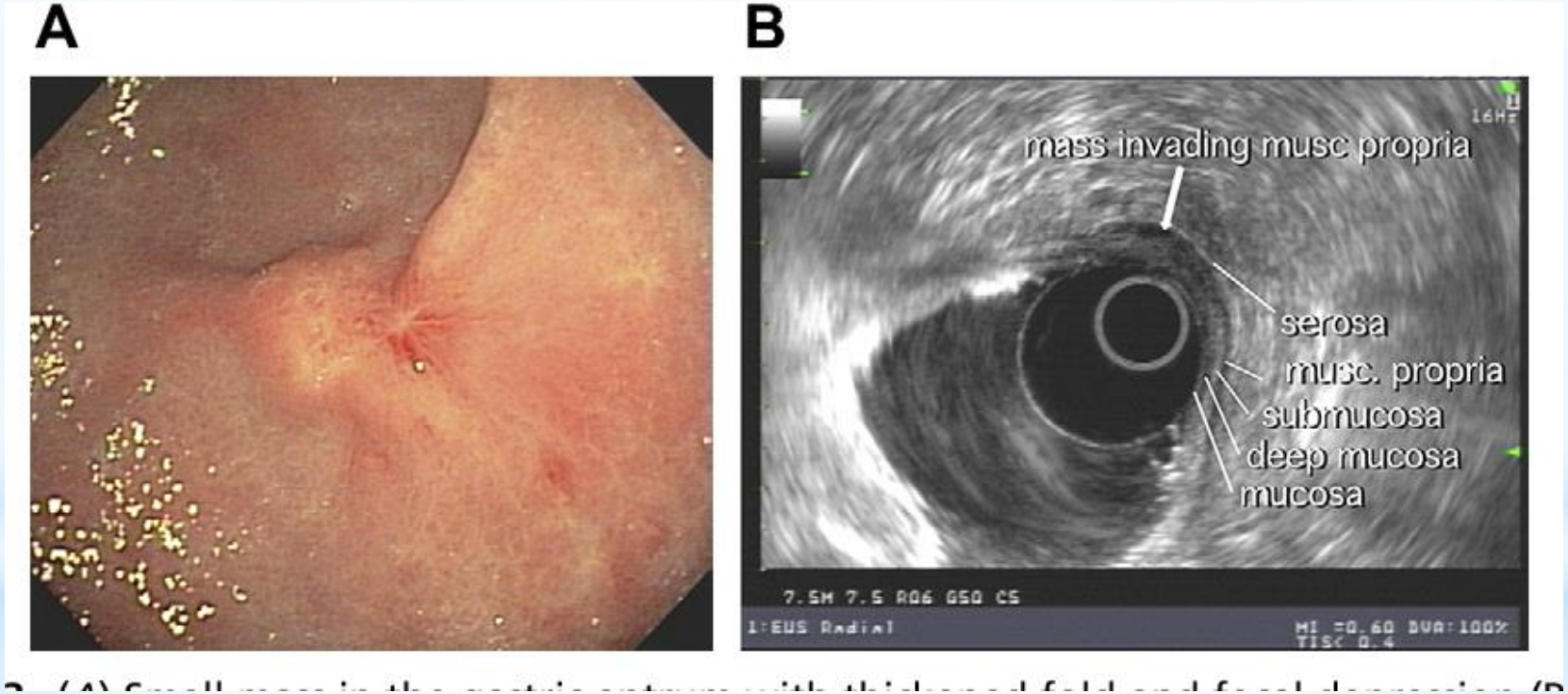
Ferlay J, Soerjomataram I. Int J Cancer. 2015;136:E359-E386.

* QUANTITATIVE DIAGNOSIS OF EGC

1.Depth of invasion

EUS

*



* QUANTITATIVE DIAGNOSIS OF EGC

2. Horizontal margin delineation

* The horizontal margin of the tumor --- determined mainly using conventional endoscopy

* when the height and color of the tumor is similar to the surrounding normal mucosa----difficult to delineate the horizontal margin accurately

* In a Japanese study, the horizontal margin was unclear in 18.9% of EGC and the characteristic endoscopic findings of these cases showed type 0-IIb lesion

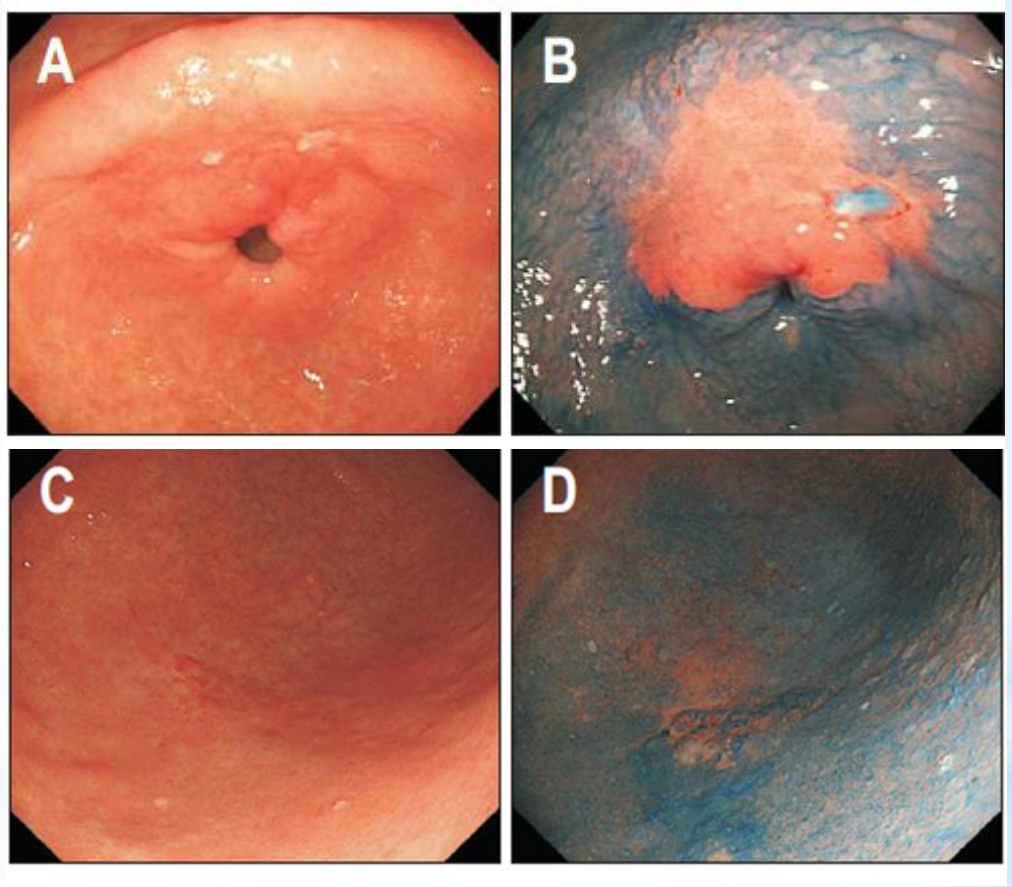
Nagahama T, Yao K, Maki S, et al. Gastrointest Endosc 2011;74:1259-1267.

*QUANTITATIVE DIAGNOSIS OF EGC

-Using the AI chromoendoscopy, the horizontal margins of differentiated-type EGCs, and not undifferentiated- type EGCs, can be observed more clearly

-In undifferentiated type, biopsy samples must be collected

Acetic acid-indigo carmine (AI) chromoendoscopy.



* Indications for Endoscopic Resection:

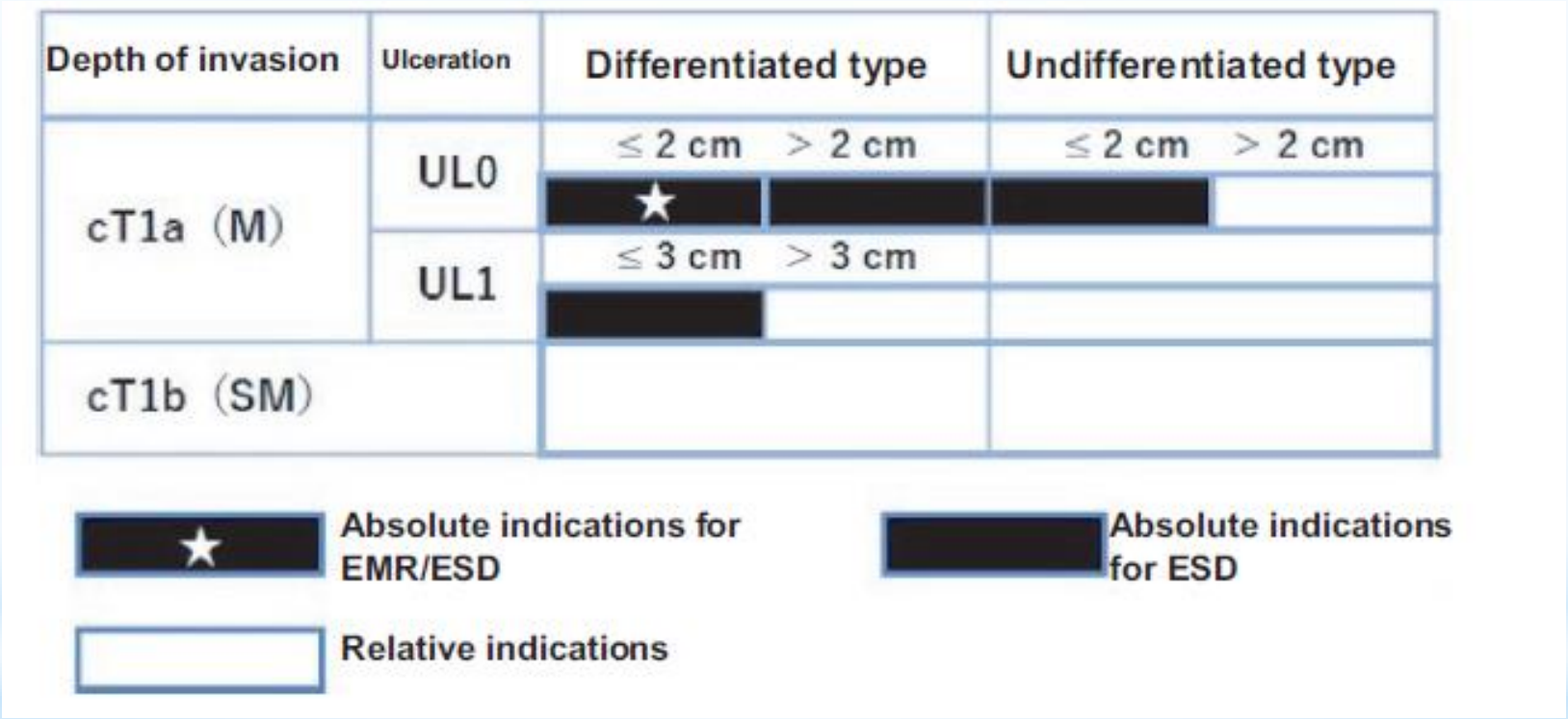
* Japanese guideline --absolute criteria for endoscopic resection,

(i) dysplastic regardless of size,

(ii) differentiated gastric intramucosal (cT1a) adenocarcinomas of any size if not ulcerated and 30 mm in size if ulcerated, and

(iii) poorly differentiated gastric intramucosal (cT1a) adenocarcinomas without ulcerative findings and 20 mm in size

* Classification of indications according to tumor-related factors.



Type of Lesion		European Guidelines	Japanese Guidelines
Dysplasia, any size		Absolute indication	
Adenocarcinoma	cT1a, well-differentiated, non-ulcerated, any size	Absolute indication	
	cT1a, well-differentiated, ulcerated, ≤30 mm	Absolute indication	
	cT1a, poorly differentiated, non-ulcerated, ≤20 mm	Expanded indication	Absolute indication
	Recurrence of an eCura-C1 lesion, staged as cT1a	-	Expanded indication

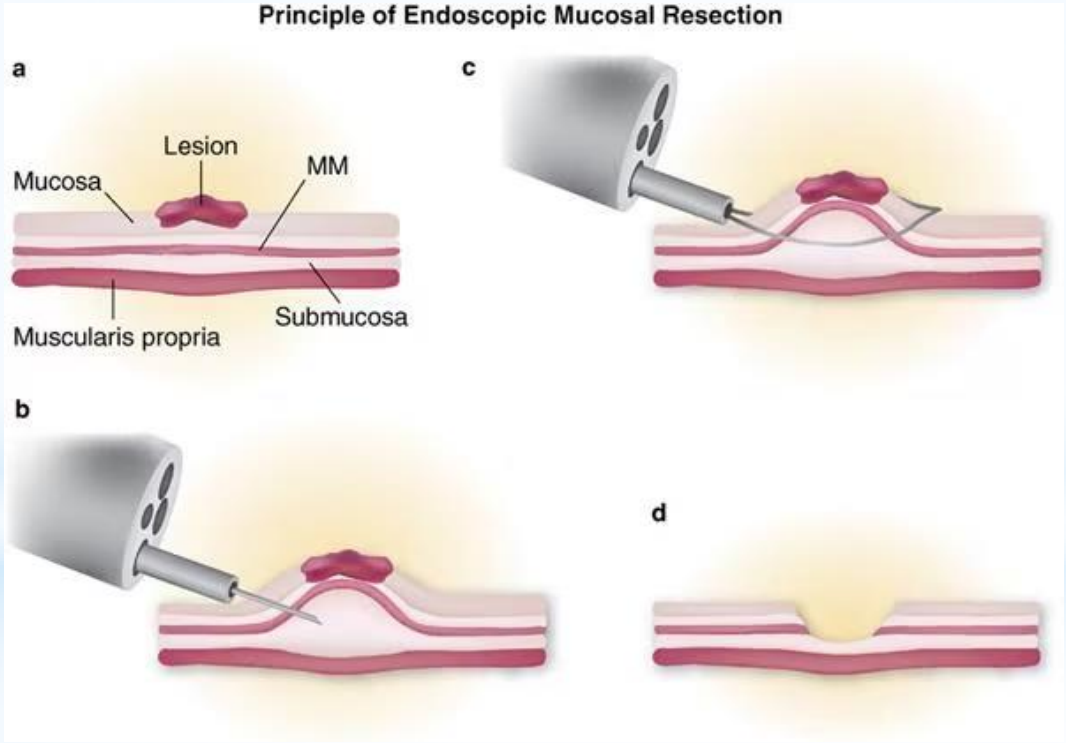
* Endoscopic Resection

* Endoscopic mucosal resection (EMR) or endoscopic submucosal dissection (ESD)

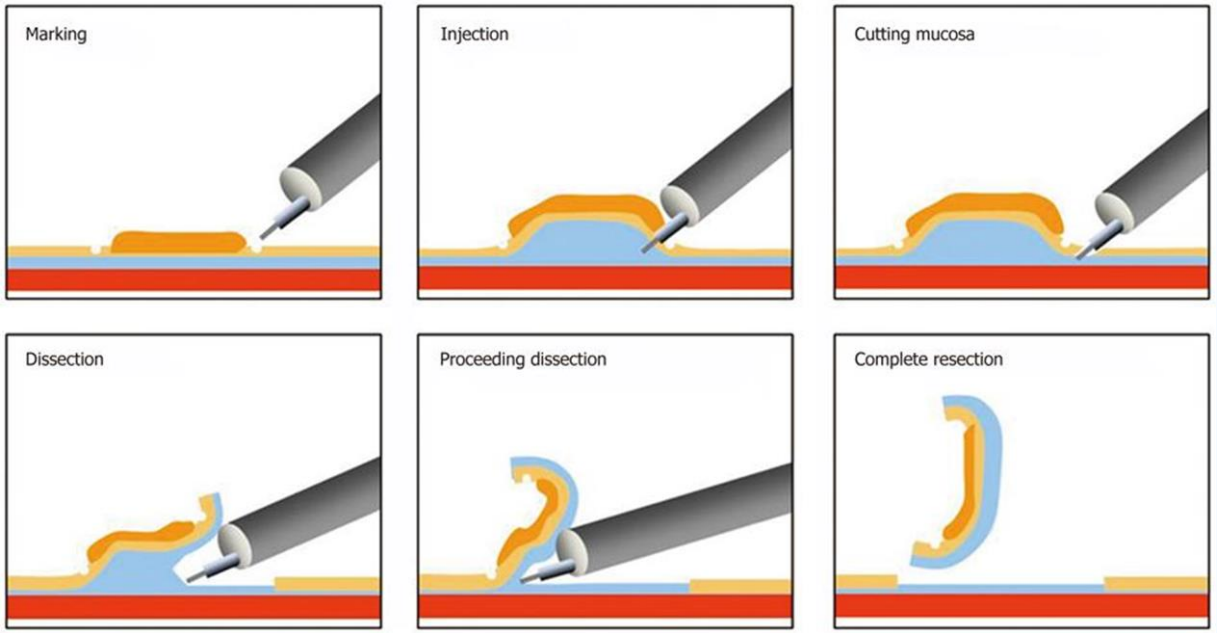
* Endoscopic Resection

EMR

* EMR was first described in 1993



* ESD

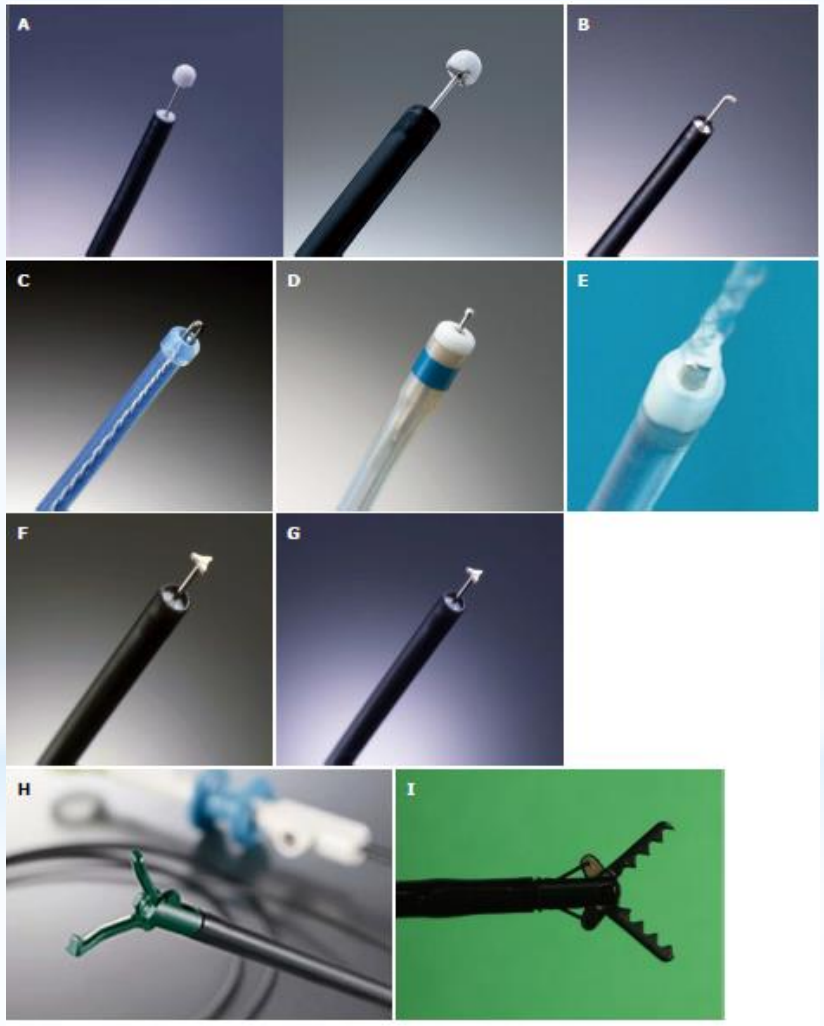


* ESD was developed in 1995
* The lesion is circumferentially outlined with coagulation marks
* then elevated after the injection of a solution in the submucosal layer
* Three to four electrosurgical incisions in the coagulation marks to access the submucosa and completes a circumferential incision around the lesion
* Finally, the submucosa is dissected in the submucosal plane to achieve an en bloc resection

* ESD

* ESD Accessories

*COMMERCIAL CUTTING KNIVES



* ESD Accessories

*WATER JET

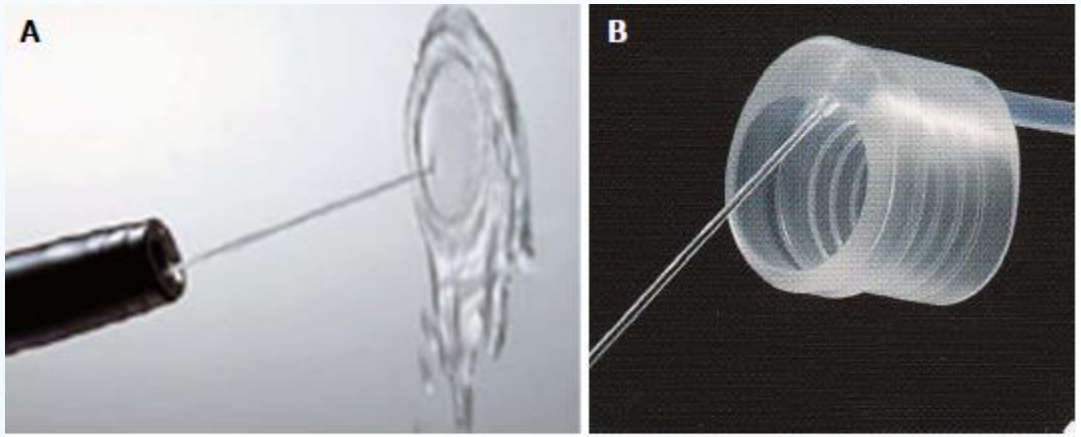


Figure 2 Water jet endoscope (A) and Irrigation hood (B).

Figure 3 Small-caliber-tip transparent hood.

* ESD Accessories

THERAPEUTIC ENDOSCOPE

-Multibending scope

-Multibending double-channel therapeutic endoscope

* EMR Vs ESD

* ESD >>>> EMR in achieving

  -en bloc and complete resection for lesions of any size,

  -higher rates of curative resection and lower recurrence.

* Regarding safety, ESD and EMR present similar levels of post-procedural bleeding,

* ESD is associated with higher perforation rates and operative time

* ESD continues to show high rates of en bloc and complete resection (over 95% and 90%, respectively) and low local recurrence (<5%) and low rates of adverse events, namely, perforation(<3%) and post-operative bleeding (5%)

* Post procedure bleeding

* The risk factors for unfavorable outcome ---

Patient	-a male gender, -cardiopathy, -antithrombotic drug use, -cirrhosis, -chronic kidney disease
Lesion	- a tumor size > 20 mm, -resected specimen >30 mm size, - localization in the lesser curvature, -a flat or depressed morphology, - carcinoma histology, -ulceration,
Procedure	- a procedure duration of >60 min, and - the use of H2 blocker.

* Endoscopic Resection

* A good long-term prognosis,

* 5-year overall (OS) and disease-specific survival (DSS) rates of 89.0–95.0% and >99%, respectively

* Endoscopic Resection Vs Surgery

* a superficial gastric lesion with a high likelihood of curability, guidelines consider endoscopic resection to be a more desirable choice of curative treatment compared to surgery

* Cost-- less

* Post-treatment follow-up

* Even when histological examination indicates endoscopic curability A (eCuraA), EGD once or twice per year

* When histological examination indicates resection of endoscopic curability B (eCuraB), follow-up with EGD, USG,CT scanning for the detection of metastases

* Summary

* An awareness of higher risk patient

* Combination of high-definition WLE and enhanced imaging (eg, NBI,iScan, FICE and magnification where available) should be carried out

  -Systematic Screening protocol for stomach

  -VS Classification

  -Prediction of Histology type

  -Depth of invasion

  -Horizontal margin delineation

* ESD is now established as the preferential endoscopic resection technique

Thank You