

Chromoscopy  
Magnifying endoscopy

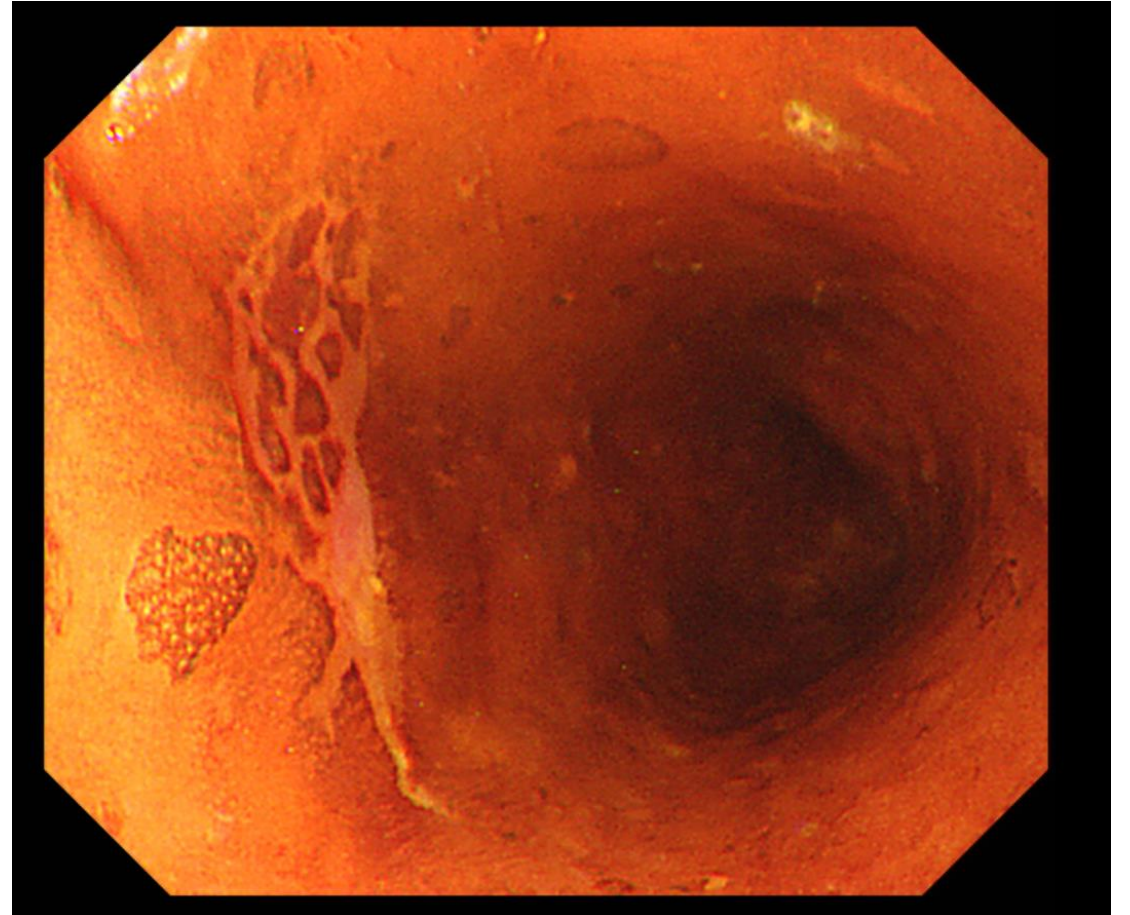
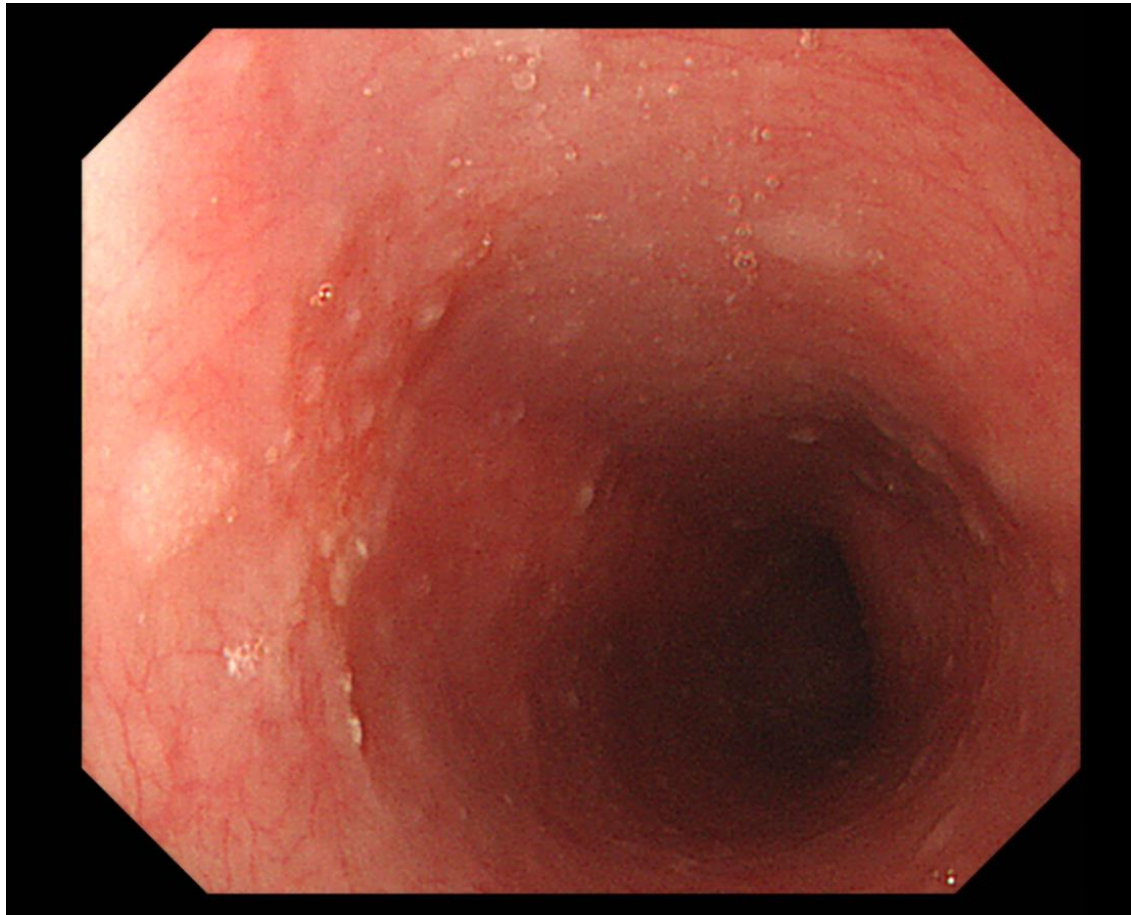
# Chromoscopy

Strain	Mechanism of staining	
<b>Absorptive strain</b>	taken up by epithelial cells either by diffusion or absorption	
Lugol's solution Methylene blue Toluidine blue		
<b>Reactive strain</b>	react with a specific constituent of the mucosal epithelial cell or with acid secretion at a specific pH level	
Congo red Phenol red		
<b>Contrast strain</b>	do not enter cells but percolate into mucosal depressions	
Indigocarmine		

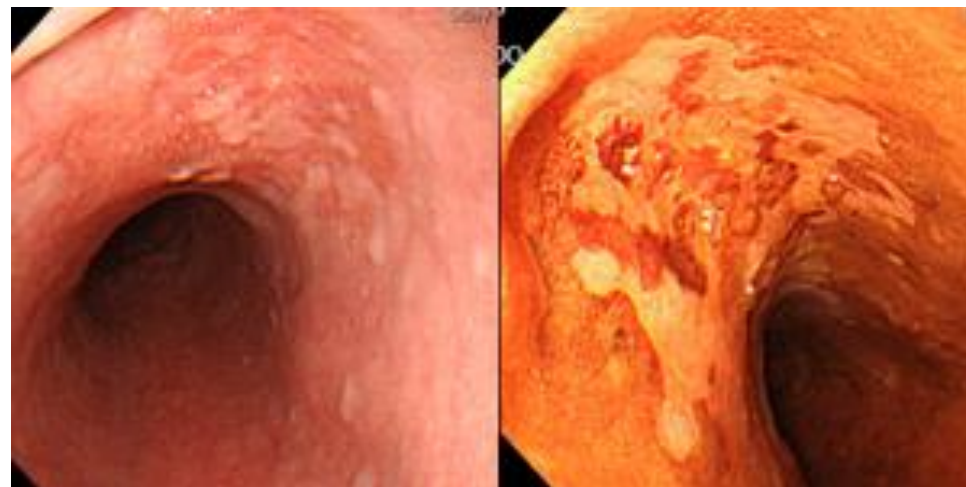
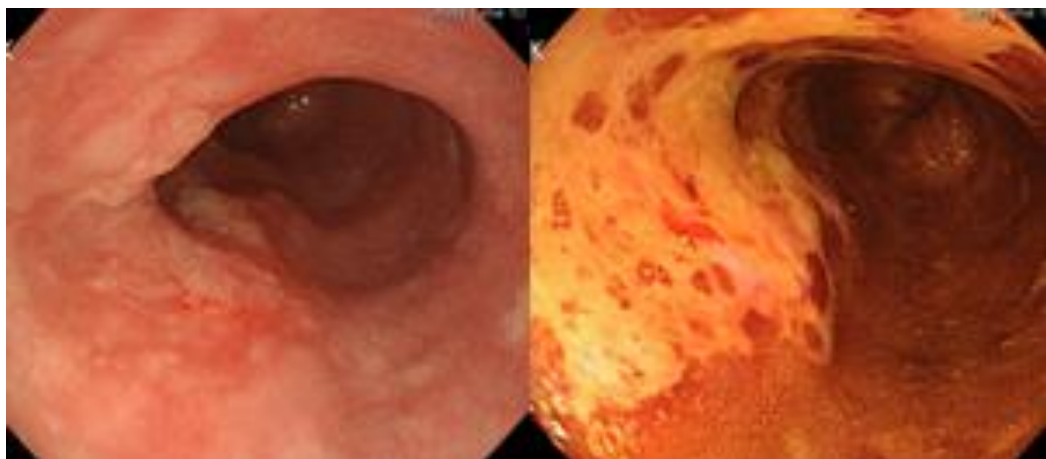
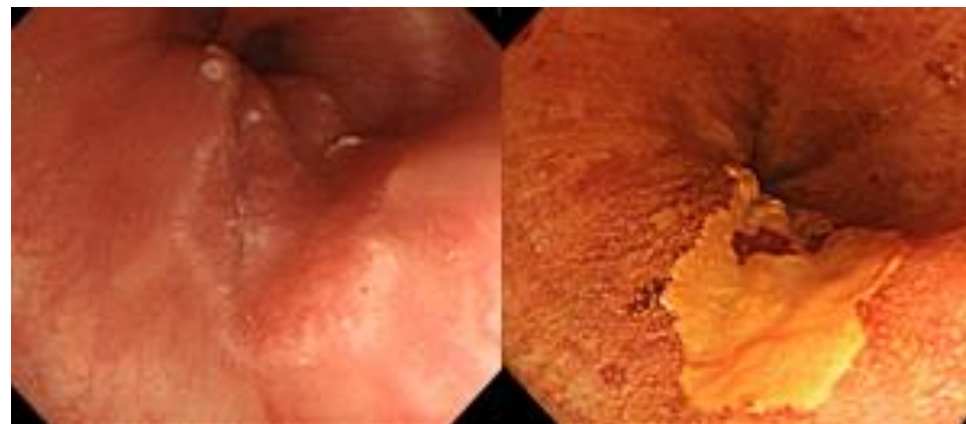
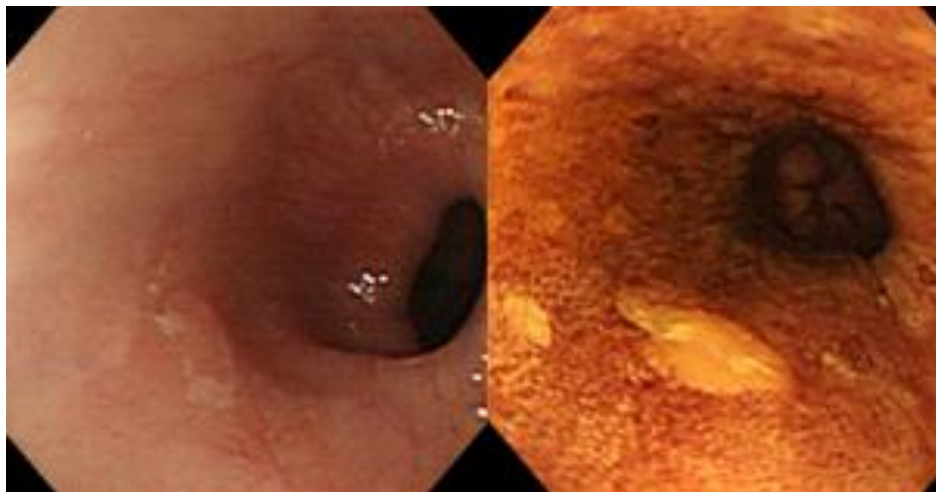
Stain	Chemical Name	Mechanism of Staining	Described Uses
Absorptive stains			
Lugol's Solution	Compound iodine solution (I + KI)	Stains glycogen in nonkeratinized squamous epithelia to brown	<u>Esophageal squamous cell carcinoma</u> Peptic esophagitis Barrett's esophagus
Methylene blue	Methyl-thionine chloride	Stains physiologically absorptive tissues blue	<u>Intestinal metaplasia of the stomach</u> <u>Gastric cancer</u> Gastric metaplasia of the duodenum
Toluidine blue	Dimethylaminotoluphenazothioni chloride	Stains the nuclei of malignant cells blue	Squamous cell carcinoma of the esophagus and oropharynx
Reactive stains			
Congo red	Biphenylene-naphthadene sulfonic acid	pH indicator that turns from red to dark blue-black in the presence of acid at pH < 3.0	Map acid secretion of gastric mucosa in the stomach and ectopic locations
Phenol red	Phenolsulfonphthalein	pH indicator that turns from yellow to red during alkalinization from pH 6.8–8.4	Gastric cancer screen with methylene blue Identification and mapping of urease production by <i>H. pylori</i> when administered with a urea solution
Contrast stains			
Indigo carmine	Sodium indigotin disulfonate	Nonabsorbed stain highlights mucosal irregularities with blue contrast	<u>Identification of inconspicuous mucosal lesions, including polyps and dysplasia of the esophagus or colon</u>
Tattooing agents			
India ink	Inconsistent mix of carbon black in aqueous or alcohol solution with varied stabilizers	Submucosal injection to permanently label a location of the gut for future identification of the serosal or the luminal aspect	Labeling locations of malignant polyps and other lesions or therapies for subsequent surveillance, intraoperative identification, or study of natural history
Indocyanine green		Parenteral dye used for cardiac function studies and hepatic function studies; described as a potentially benign tattooing agent	As for India ink

# Lugol solution

- Diluted Iodine/potassium-iodine solution
- 2 - 3 % 용액을 5 - 10 mL 정도 사용
- iodine이 **nonkeratinized squamous epithelium** 글리코겐에 affinity를 가지고 있음.
  - 정상 식도 상피 : 갈색으로 염색
  - 이형성이나 암 : 루골액이 흡착되지 않음.



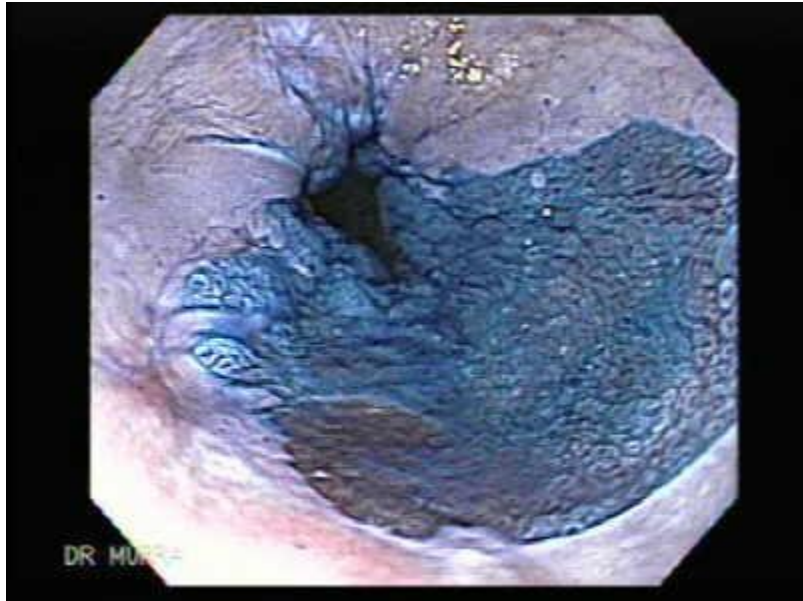




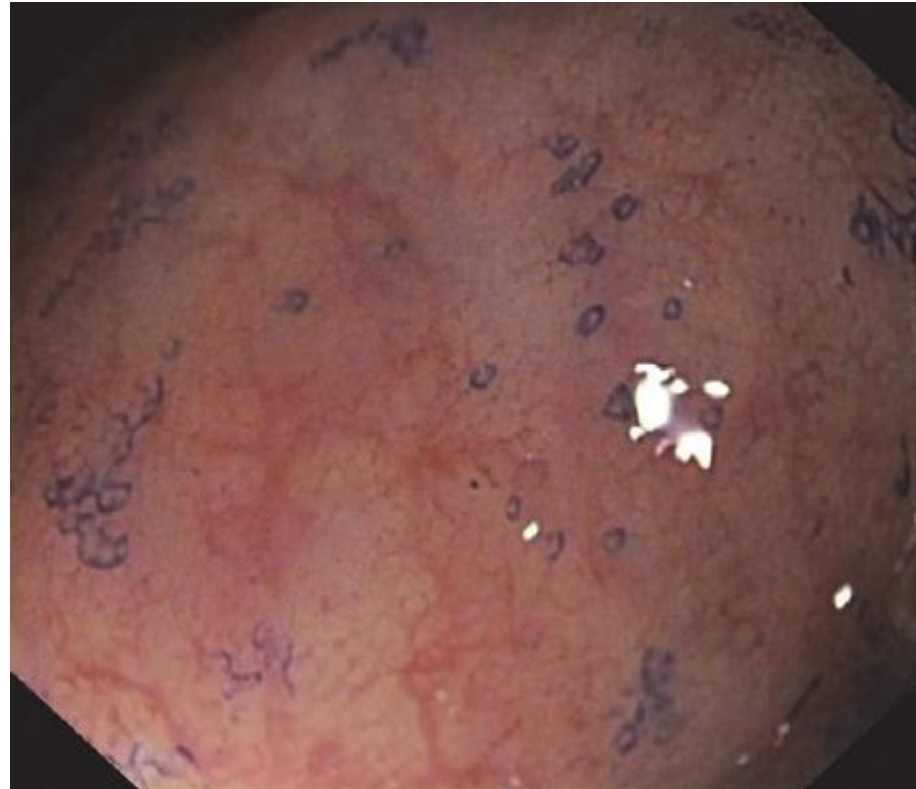
Endotody

# Methylene blue

- methylthionine chloride
- 보통 0.5-1 % 용액을 분무-> 1-2분 뒤 물로 씻고 관찰
- **intestinal metaplasia** 부위가 푸른색으로 염색



Barrett esophagus

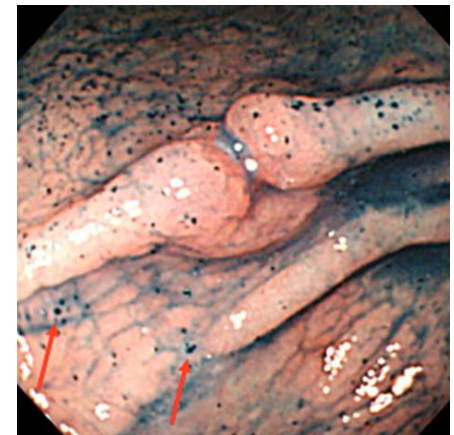
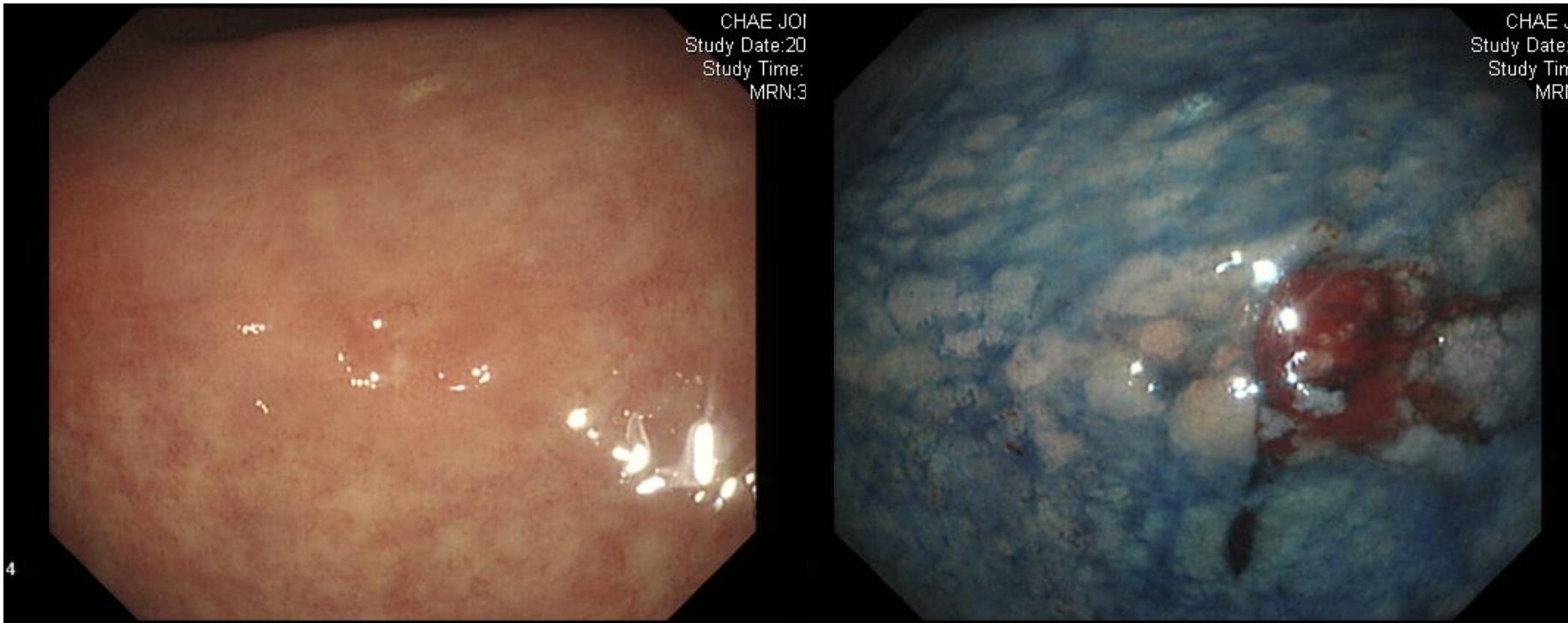
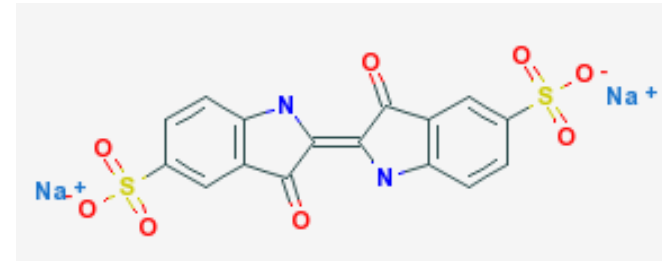


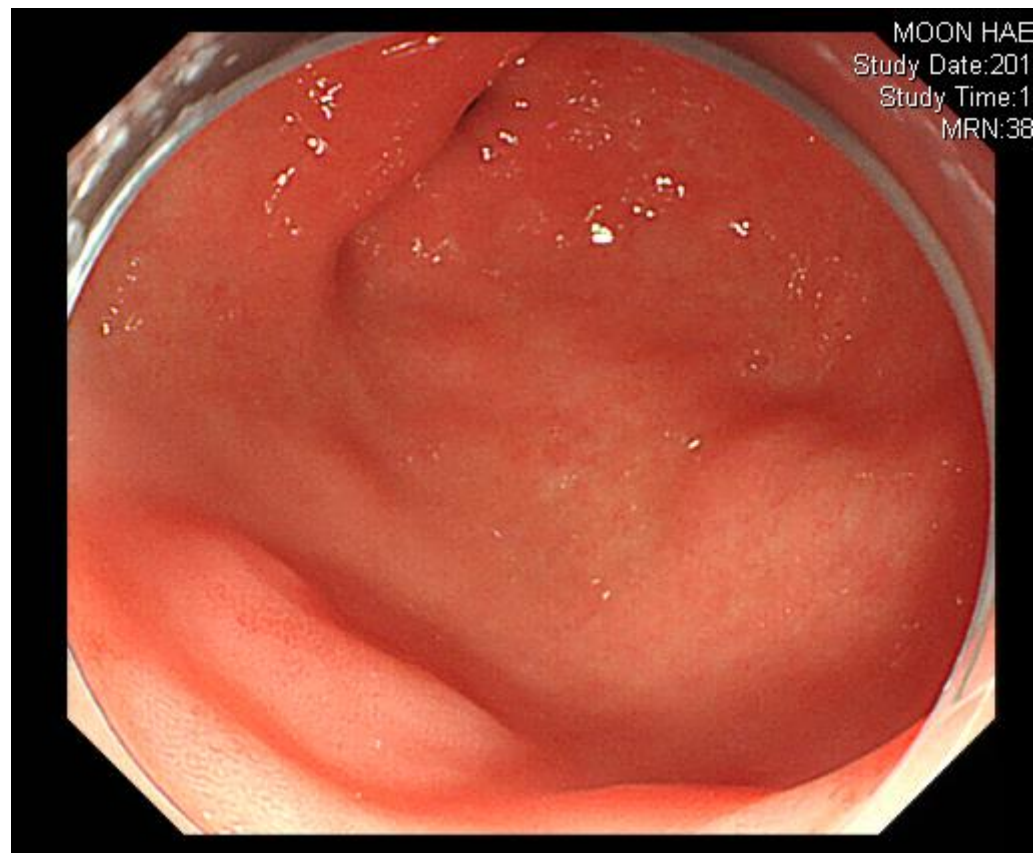
Intestinal metaplasia in chronic atrophic gastritis



# Indigo carmine

- 점막의 요철을 강조하는 색소





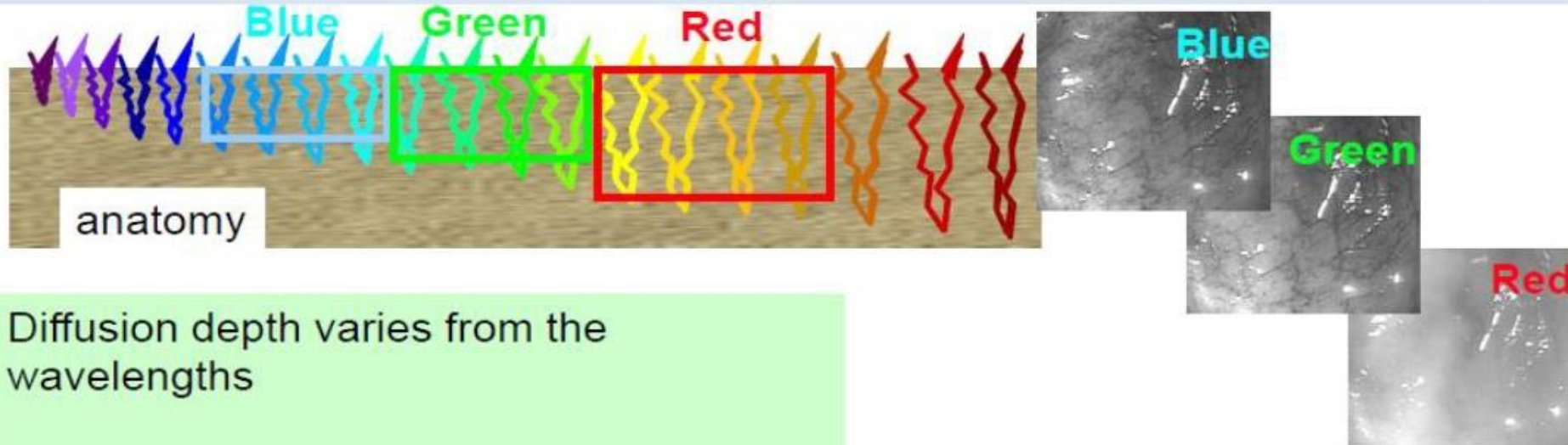
# [IEE. Image enhanced endoscopy]

- 광학적으로 혹은 전자적으로 일정 파장만 이용하여 같은 병소를 다른 색조로 관찰하는 기술
- NBI (narrow band imaging) by Olympus
  - Contrasts **surface structure** and **vascular architecture** of the superficial mucosa



# Principles

Difference of the diffusion depth and the color tone of 415 nm and 541 nm wavelengths



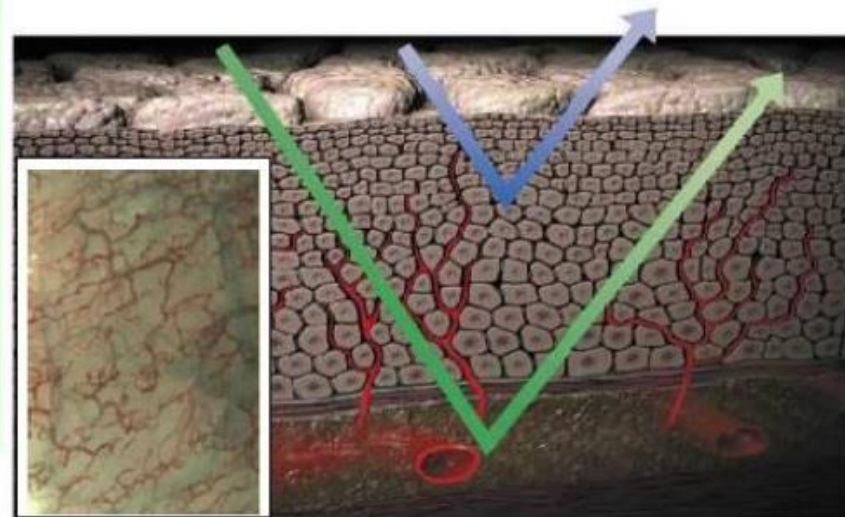
Diffusion depth varies from the wavelengths

NBI uses 2 wavelengths which respectively effect for the visualization

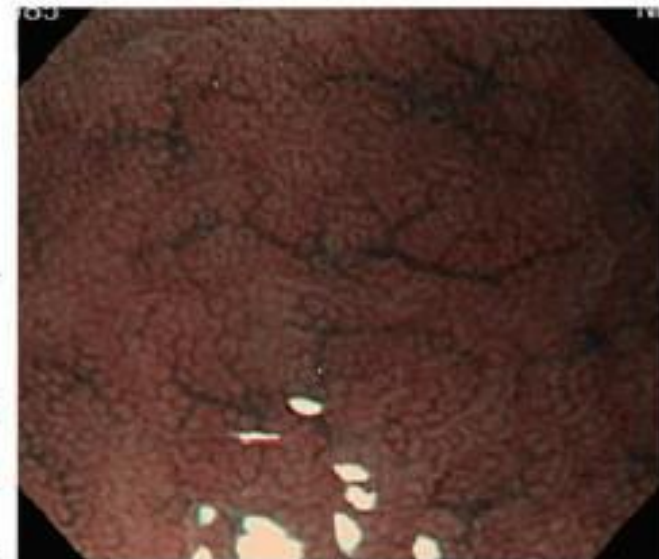
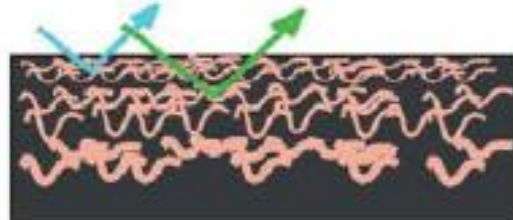
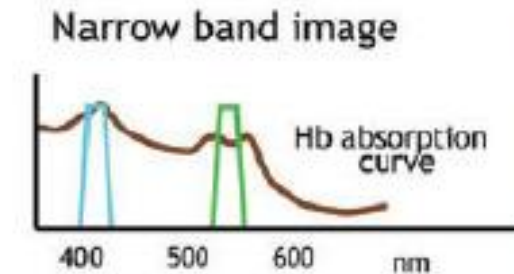
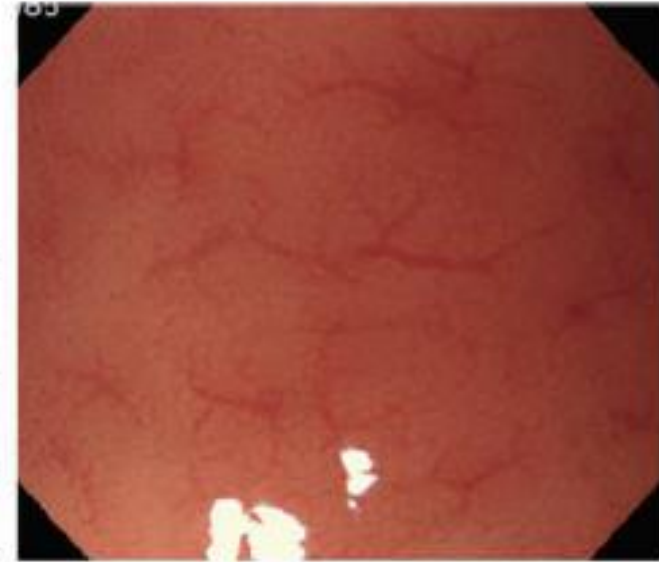
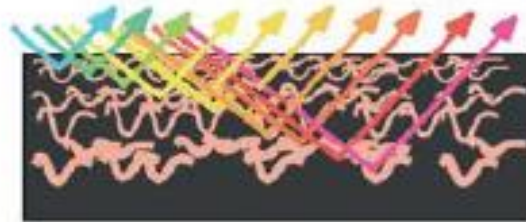
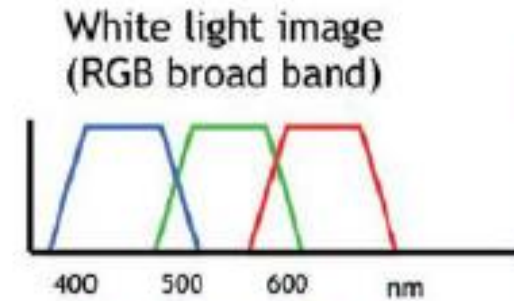
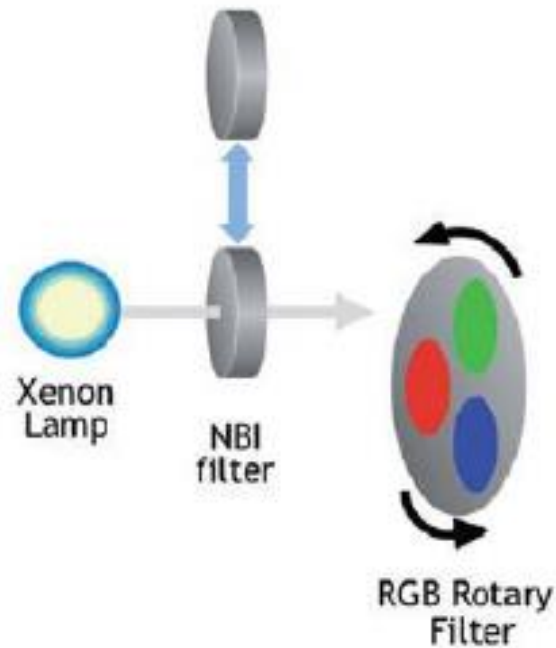
415nm = Capillaries on mucosal surface (Brown)

541nm = Veins in submucosa (Cyan)

Depicting the spatial effect by visualizing in different color tone



# Principle of narrow band imaging(NBI) endoscopy system



## Short wavelength light

- Reflects and scatters at the superficial layer of the mucosa
- Blue/green light is absorbed well by Hb
- Represent capillary or vessel architecture in the superficial mucosa.



Se:1  
35320398  
JEONG  
HO YONG

M

06/19/2017  
09:28:54

SCV: 71

C<sub>T</sub>: N E<sub>H</sub>: A5  
C<sub>E</sub>: 0 Z: 1.0

KSH



C127  
W256

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Study Time:09:15:00  
MRN:35320398

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HO YONG

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06/19/2017  
09:29:07

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KSH



C127  
W256

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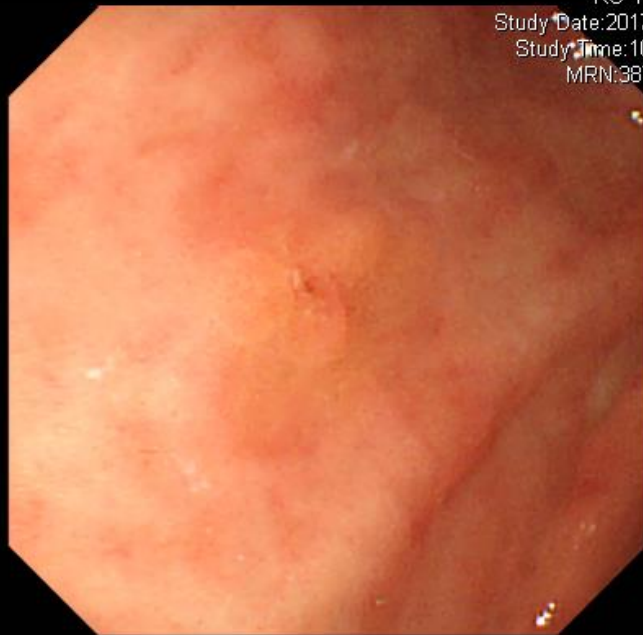
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HJT

GIF-XQ260  
Serial No. : 2521947  
Channel : 2.8  
Distal End : 9.0



KO YE EUN  
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C127  
W256

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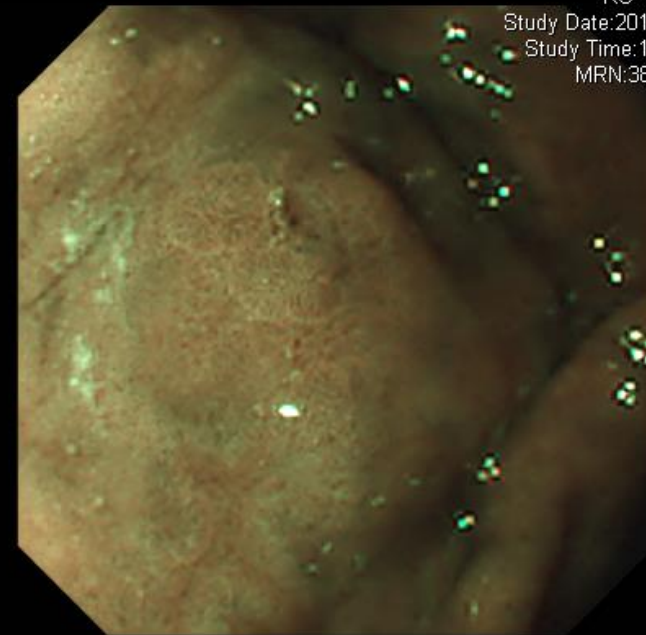
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KO YE EUN  
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MRN:38732769

C127  
W256

Se:1  
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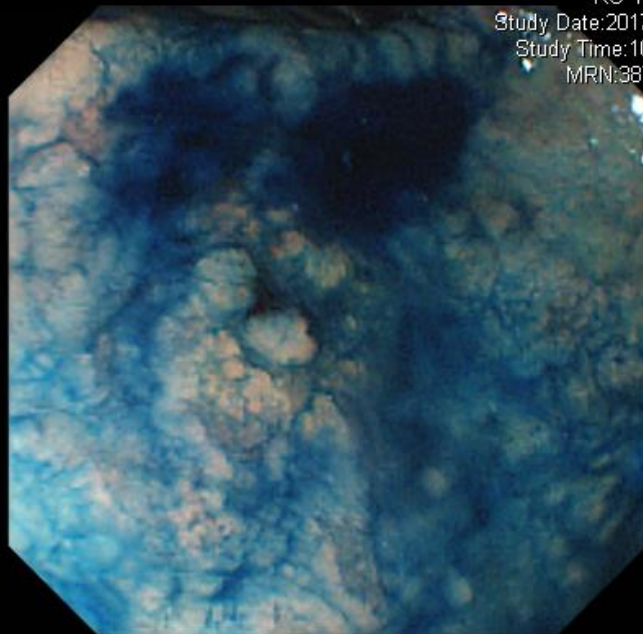
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HJT

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Channel : 2.8  
Distal End : 9.0



KO YE EUN  
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Study Time:10:29:00  
MRN:38732769

C127  
W256

Se:1  
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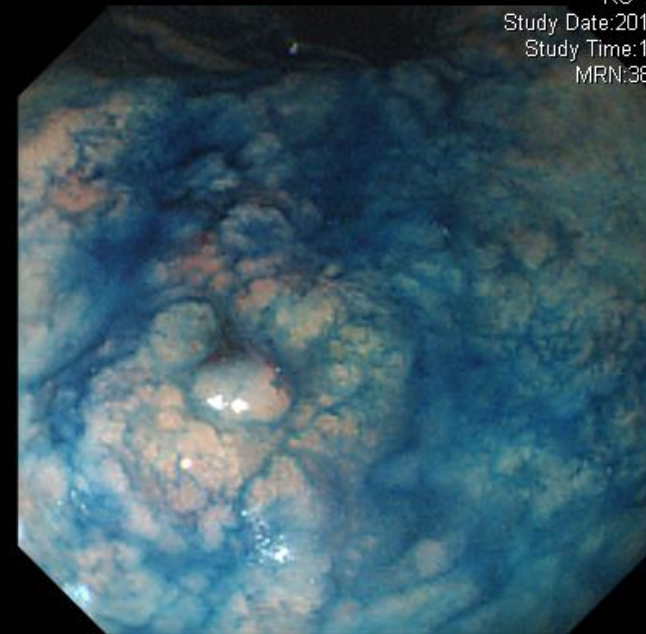
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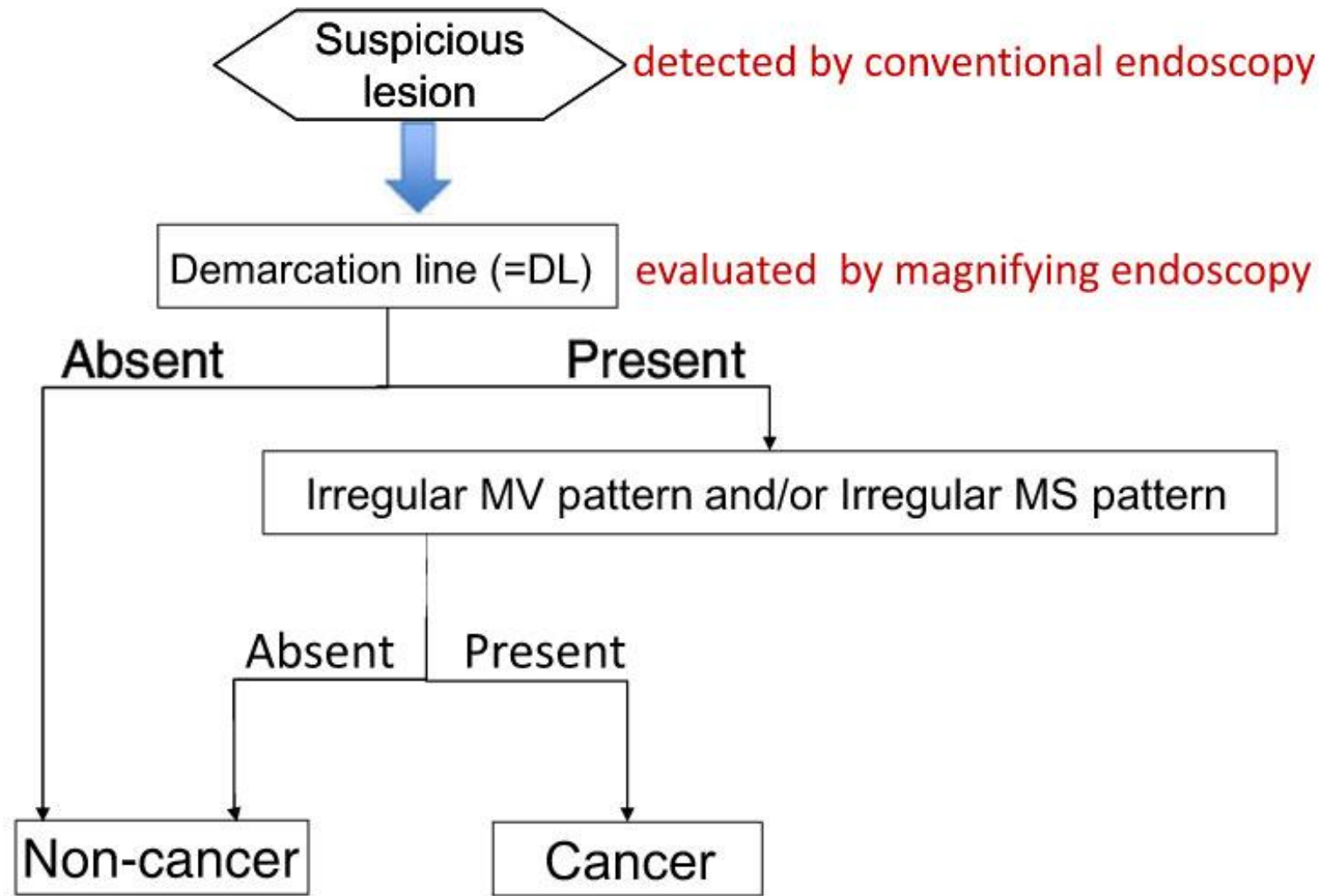
C127  
W256

# Magnifying endoscopy

- Endoscopic imaging technique that enhances visualisation of fine mucosal structures and capillary patterns.
- A transparent cap is affixed to the tip of the endoscope in order to maintain a distance of 2-3 mm between mucosa maintain good focus

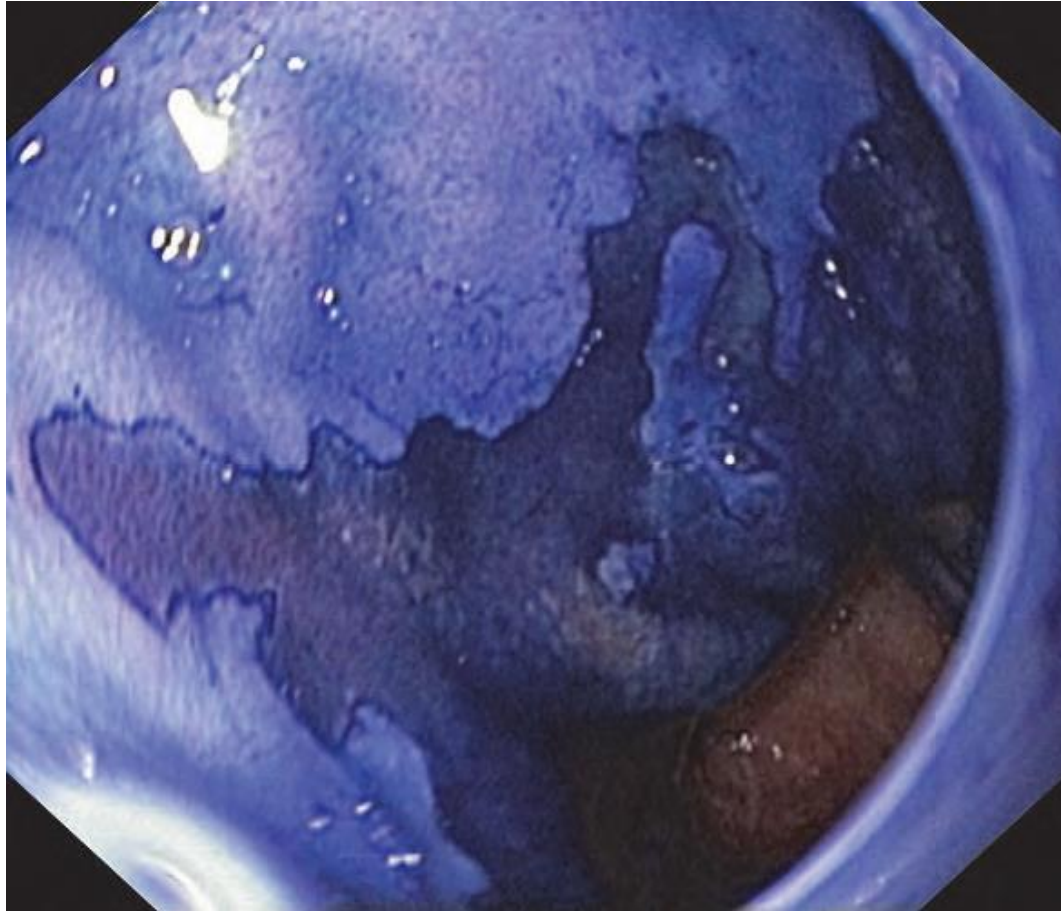


## Algorithm of GCA diagnosis with magnifying endoscopy



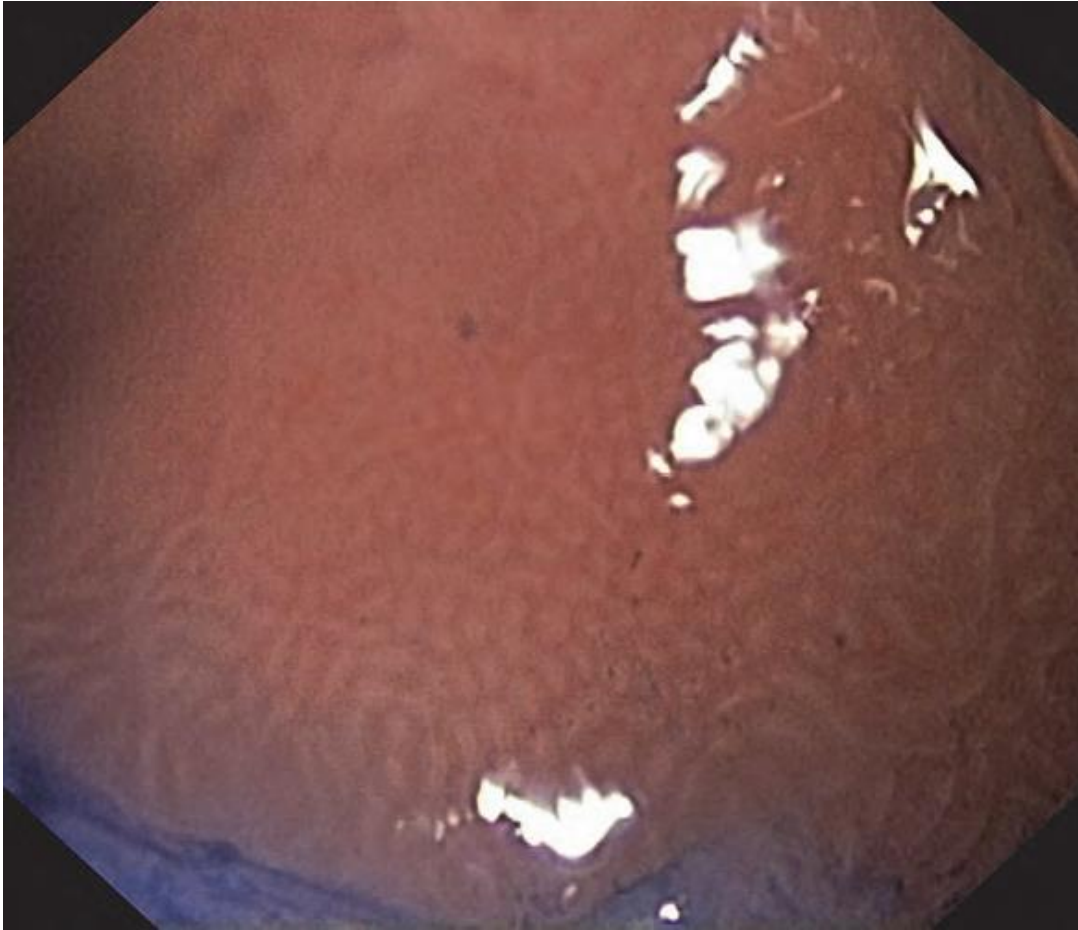


# Barrett's esophagus

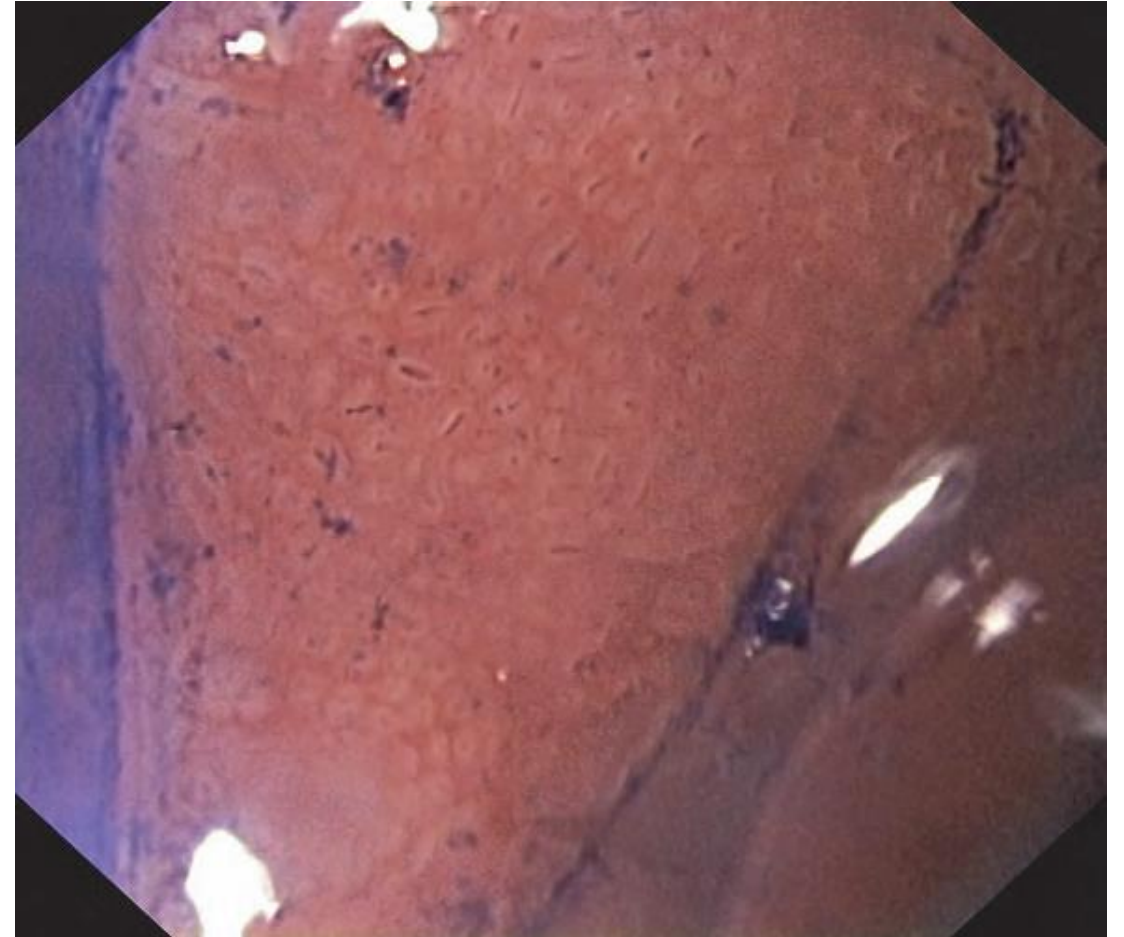


- Long-segment Barrett's esophagus: methylene blue selectively stains specialized columnar epithelium

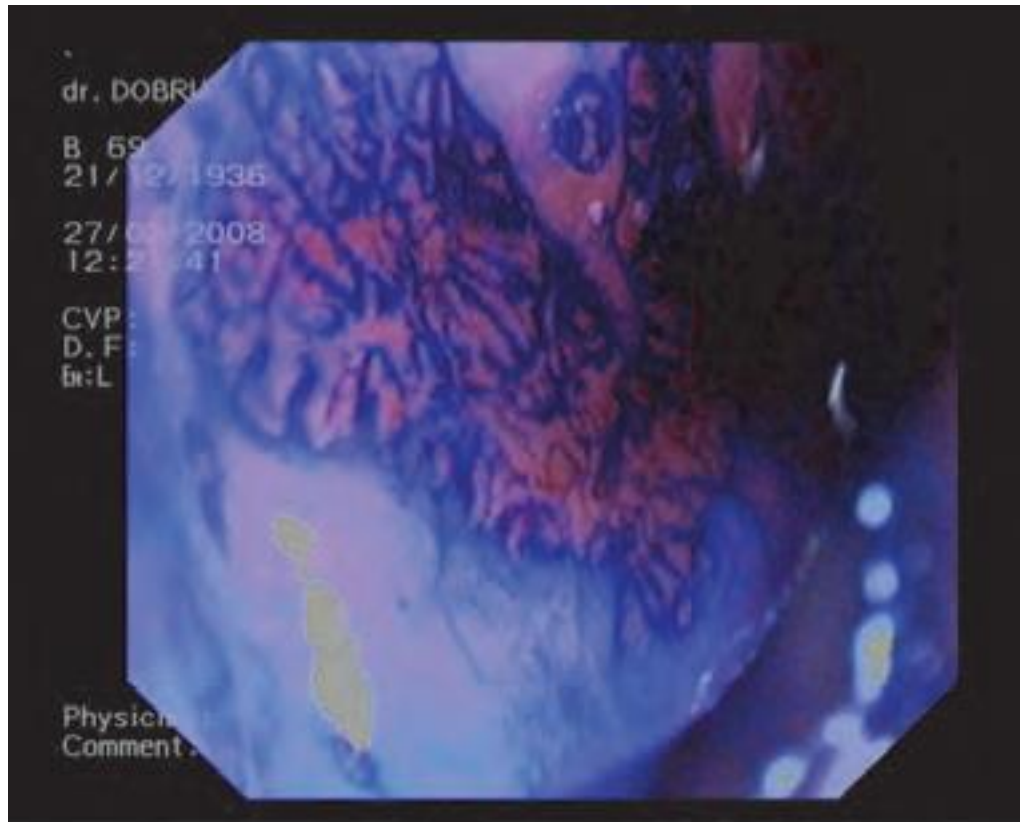




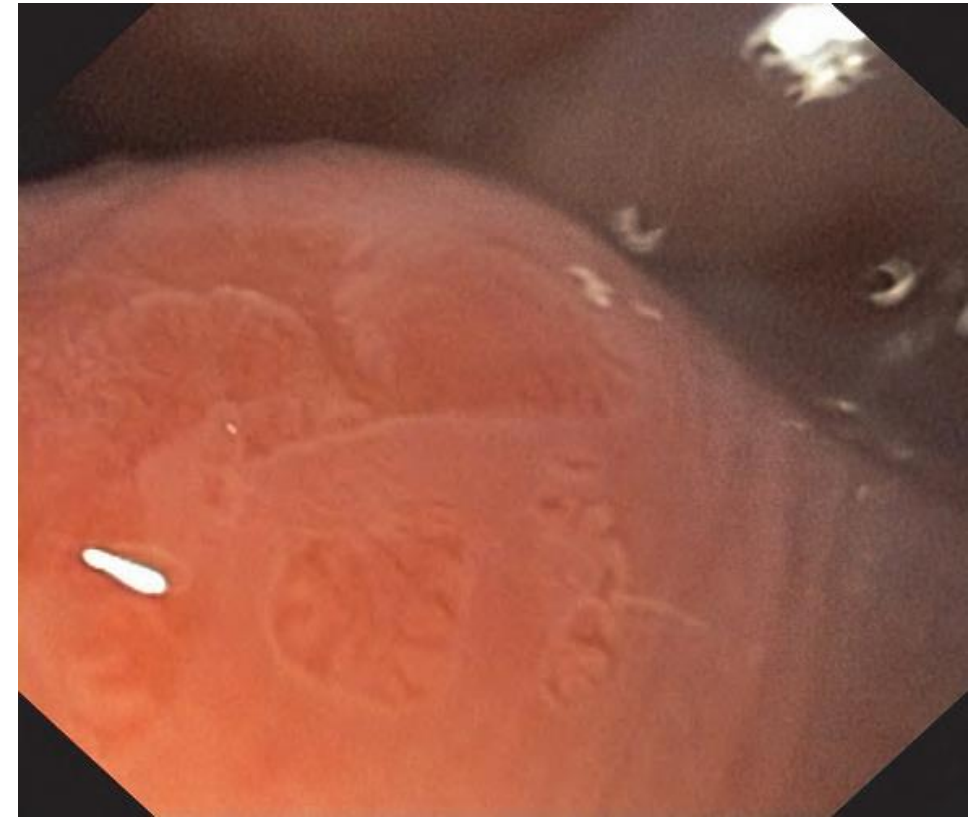
Circular or oval pits corresponding to cardiac-type mucosa



Round pits regular in shape and arrangement corresponding to fundic mucosa



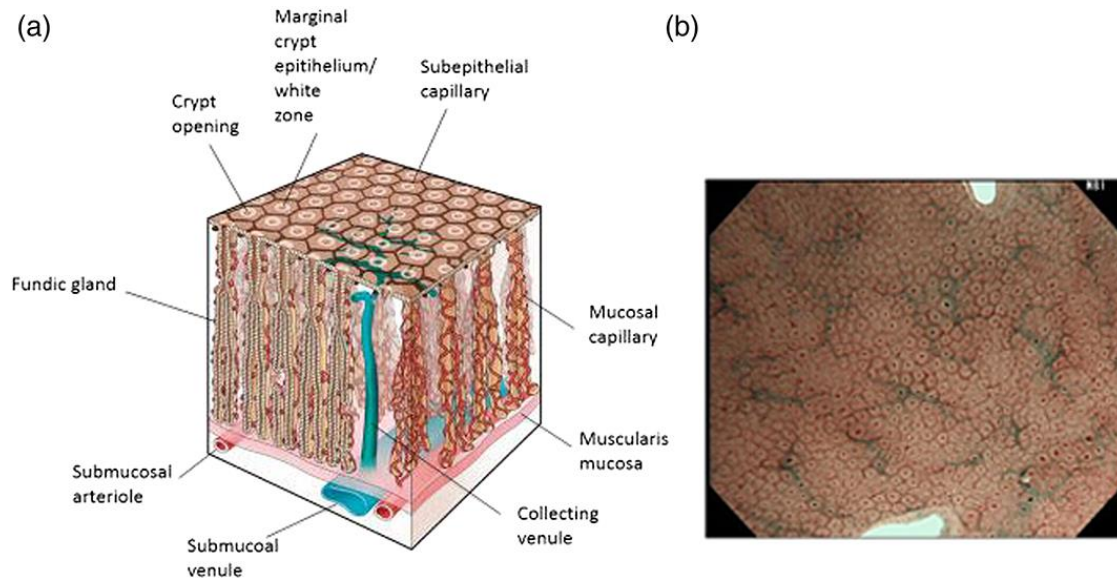
Tubular pattern corresponding to intestinal metaplasia



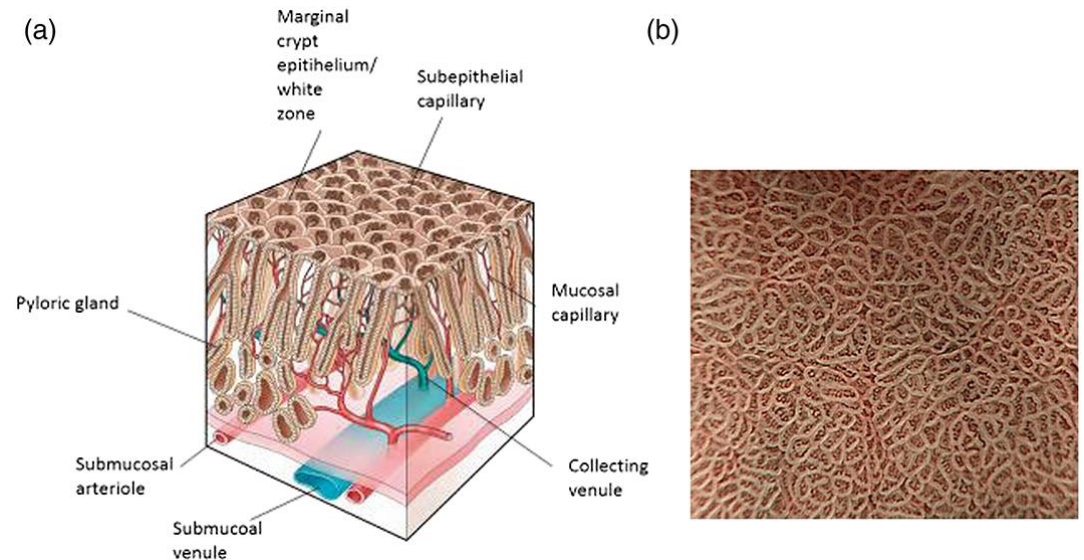
Villous pattern corresponding to intestinal metaplasia in a short-segment BE

# Stomach

- Small round pits of uniform shape are identified in normal gastric body mucosa.
- The capillary loops surround the necks of gastric pits and have a honeycomb-like appearance under magnification



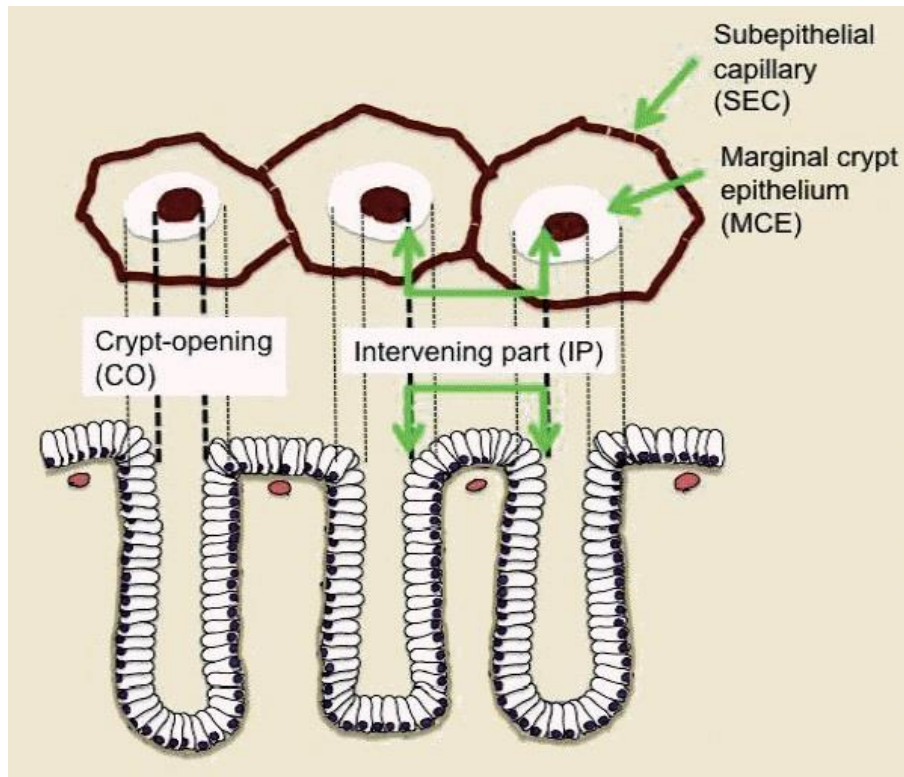
**Fundic gland**



**pyloric gland**

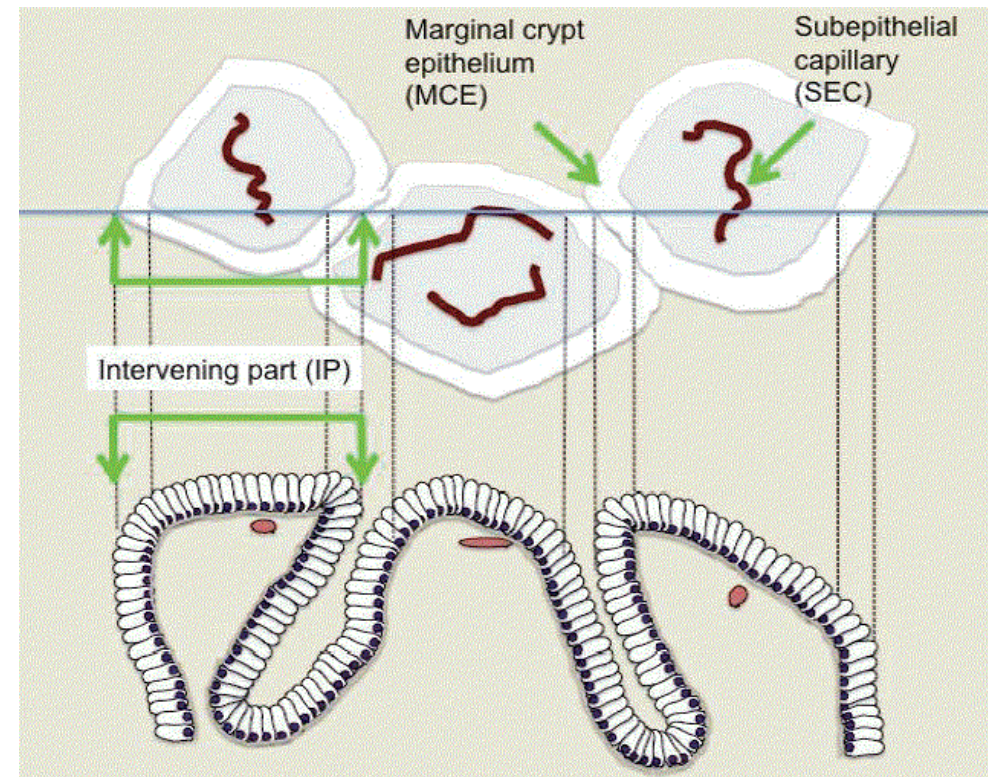


microvascular pattern은 SECN (subepithelial capillary network)가 벌집모양을 이루며, microsurface pattern은 marginal crypt epithelium (MCE)에 둘러싸인 crypt opening (CO)이 SECN 중앙에 위치



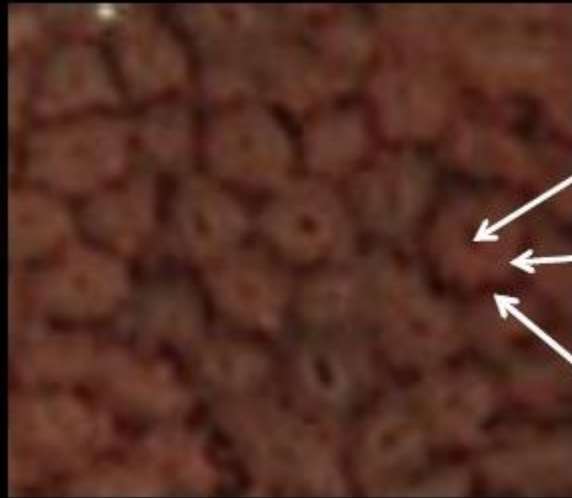
**Fundic gland**

microvascular pattern은 dark brown colored coil-shaped open loop를 이루며, microsurface pattern은 regular polygonal 또는 curved marginal crypt epithelium pattern

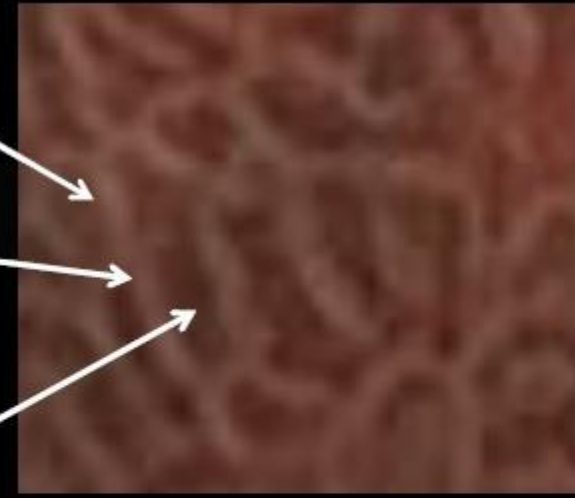


**pyloric gland**

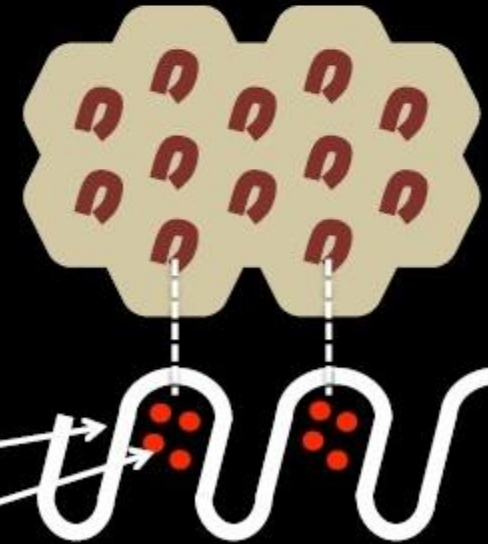
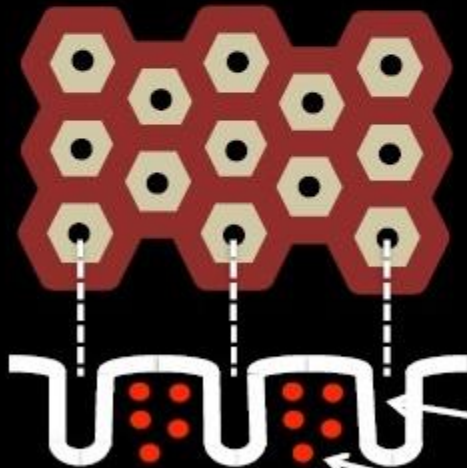
Fundic mucosa



Pyloric/atrophic mucosa



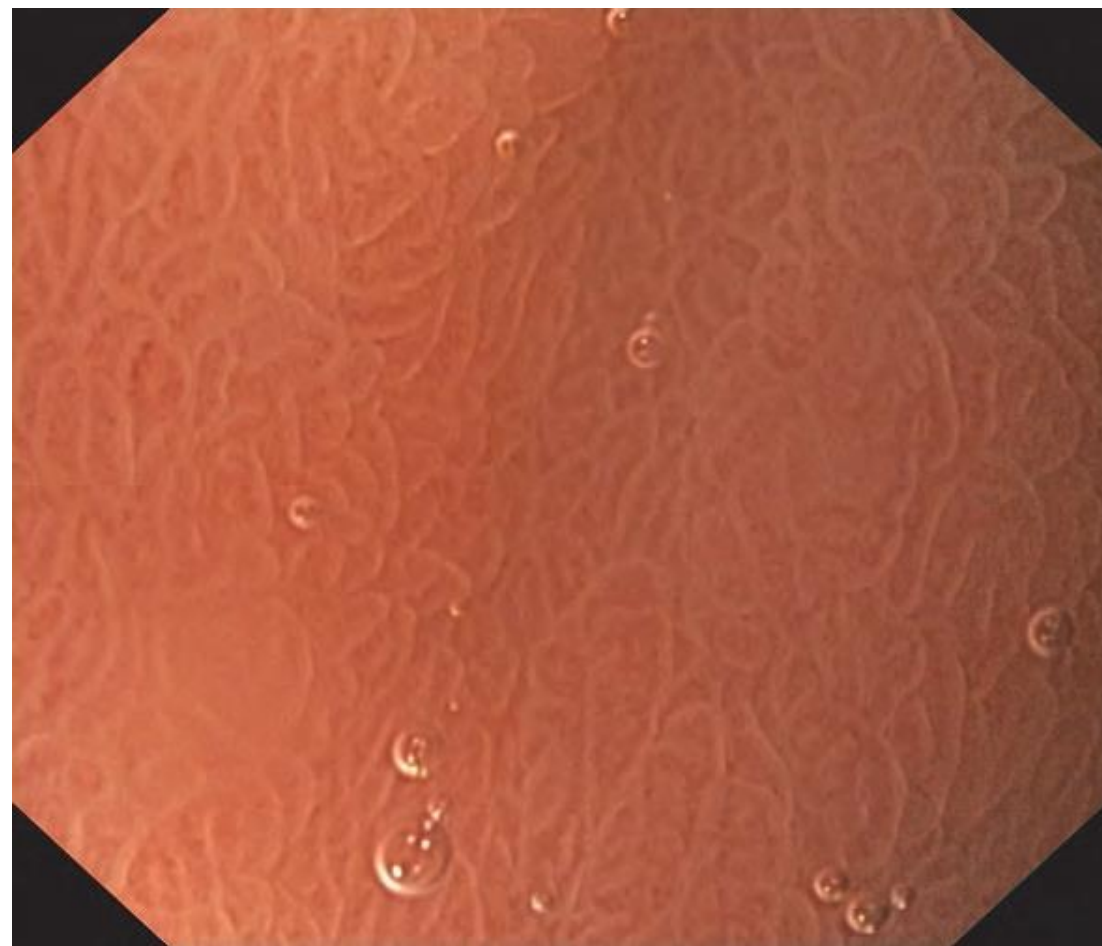
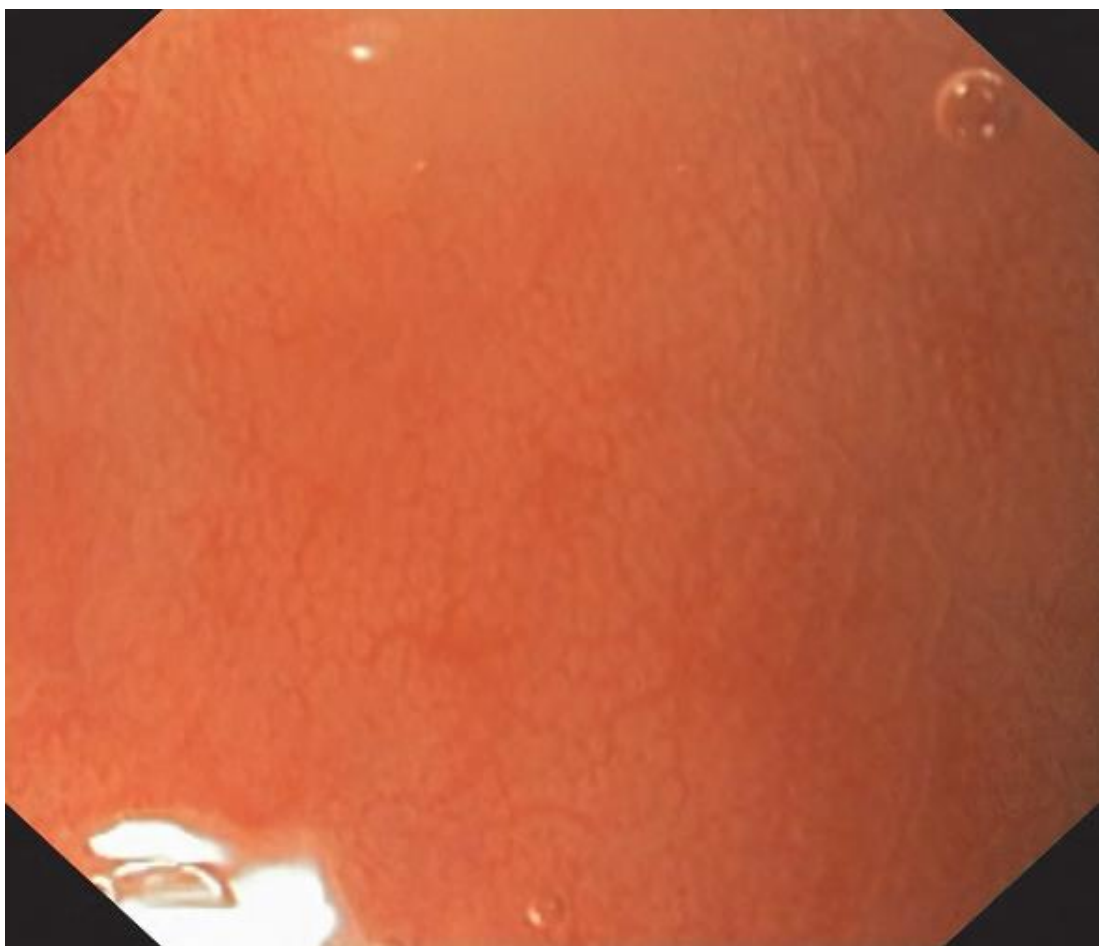
Crypt opening  
Marginal crypt  
epithelium  
Subepithelial  
capillary network



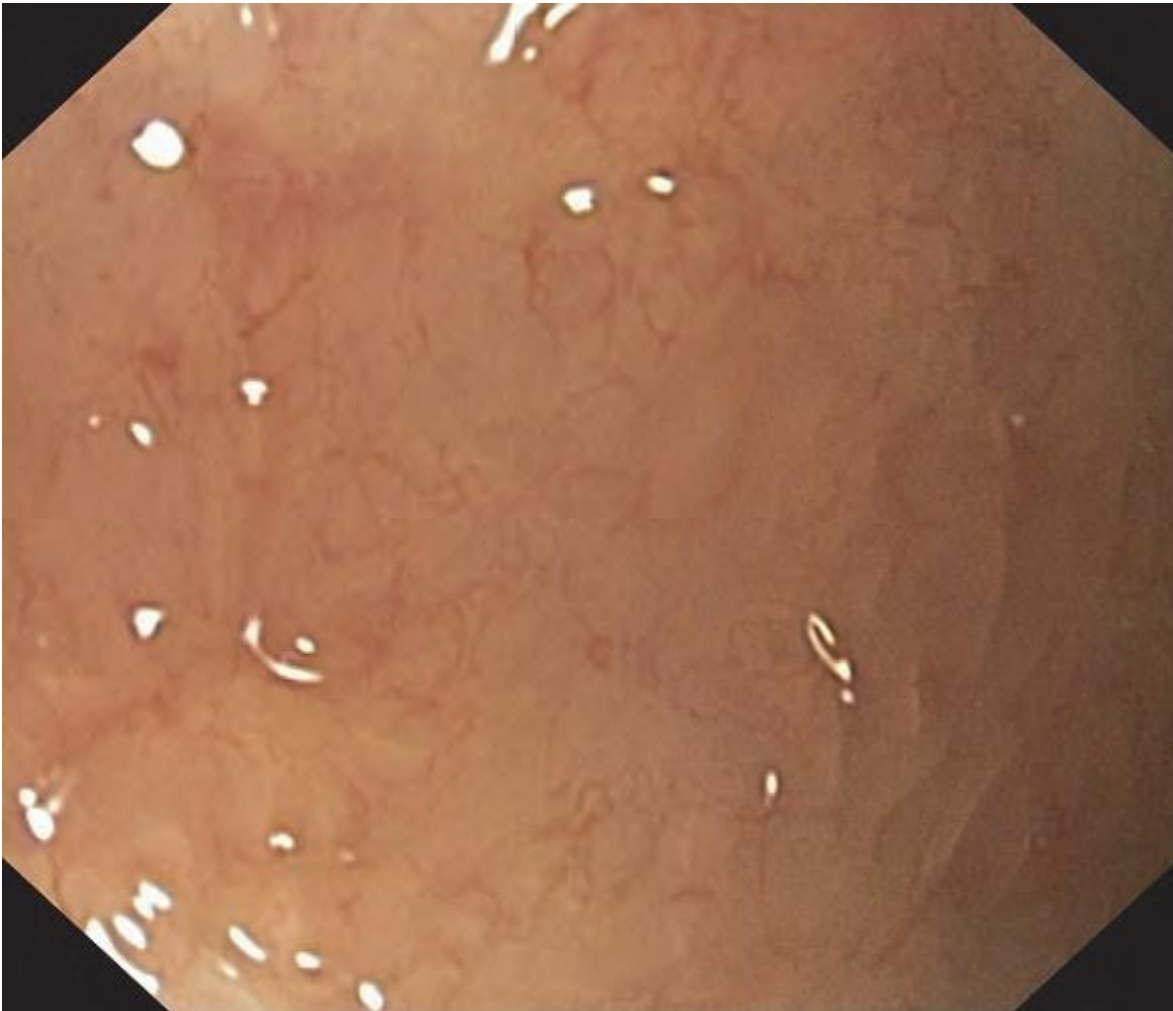
CO

SECN



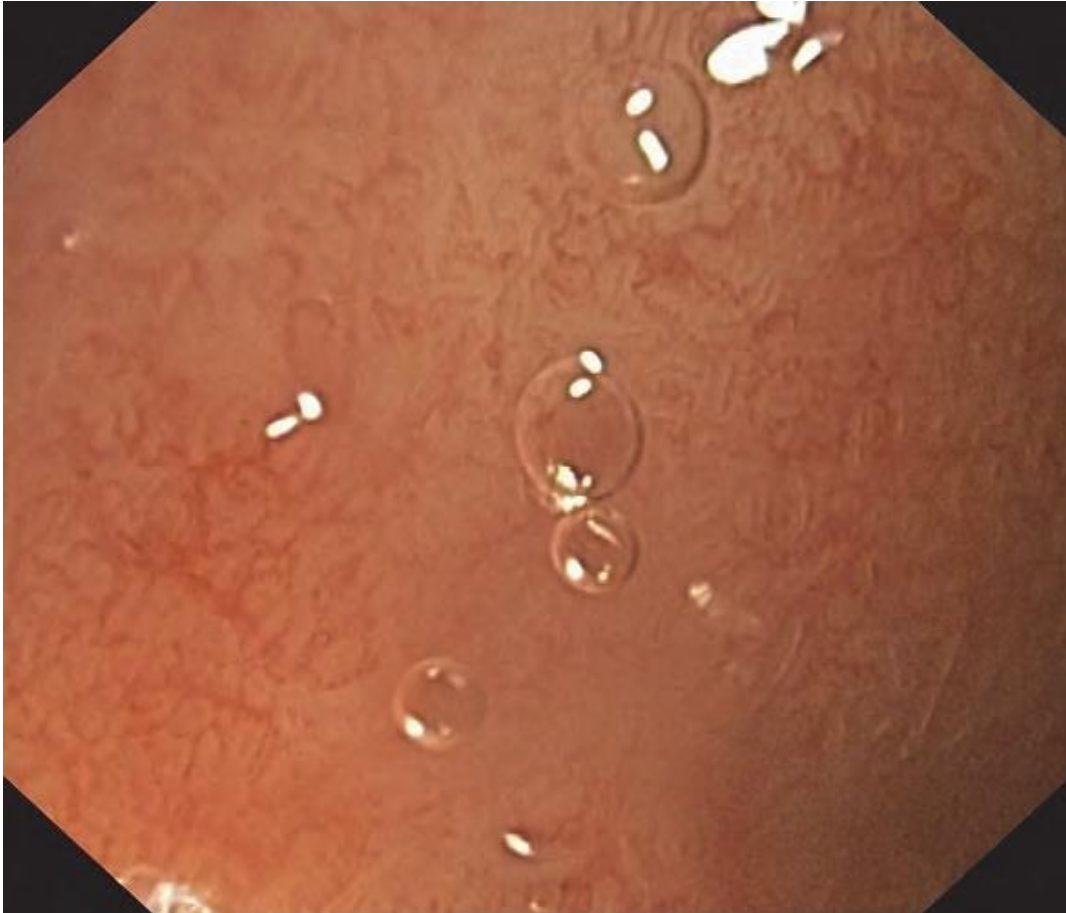


# Chronic gastritis



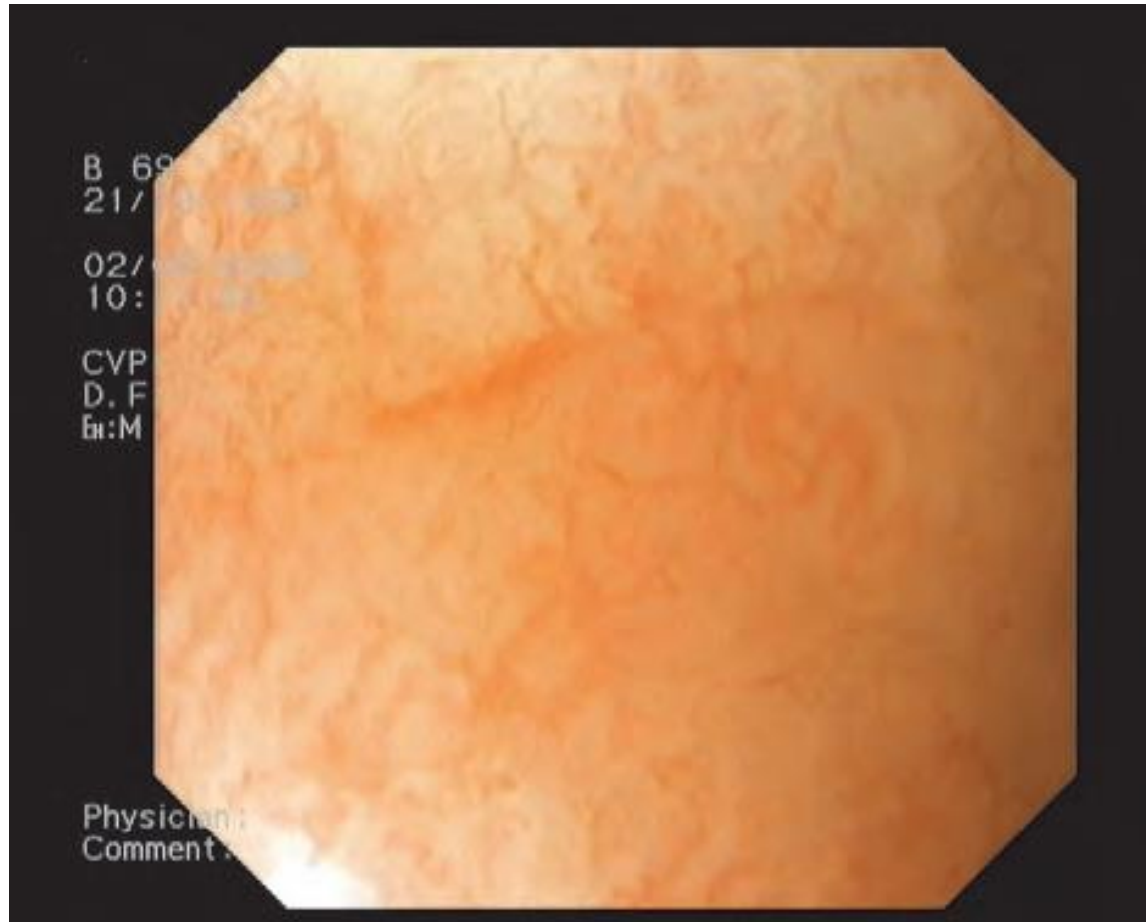
- Atrophic gastritis: the disappearance of normal SECN and round pits, irregular arrangement of CVs

# LGD



Area with lack of visible structure in a patient with LGD

# EGC



- Irregular shape and arrangement of microvessels

감사합니다.



