



대장용종절제술

고주파전원장치 SETTING을 포함하여

Eun-Ran Kim

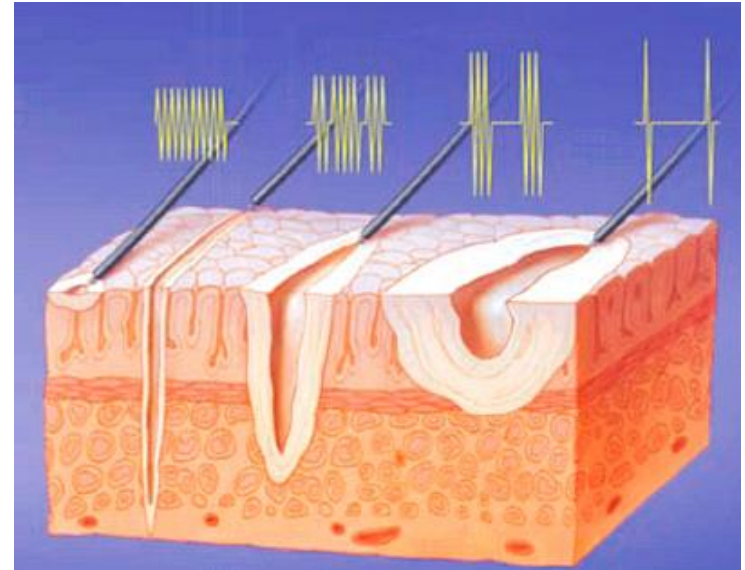
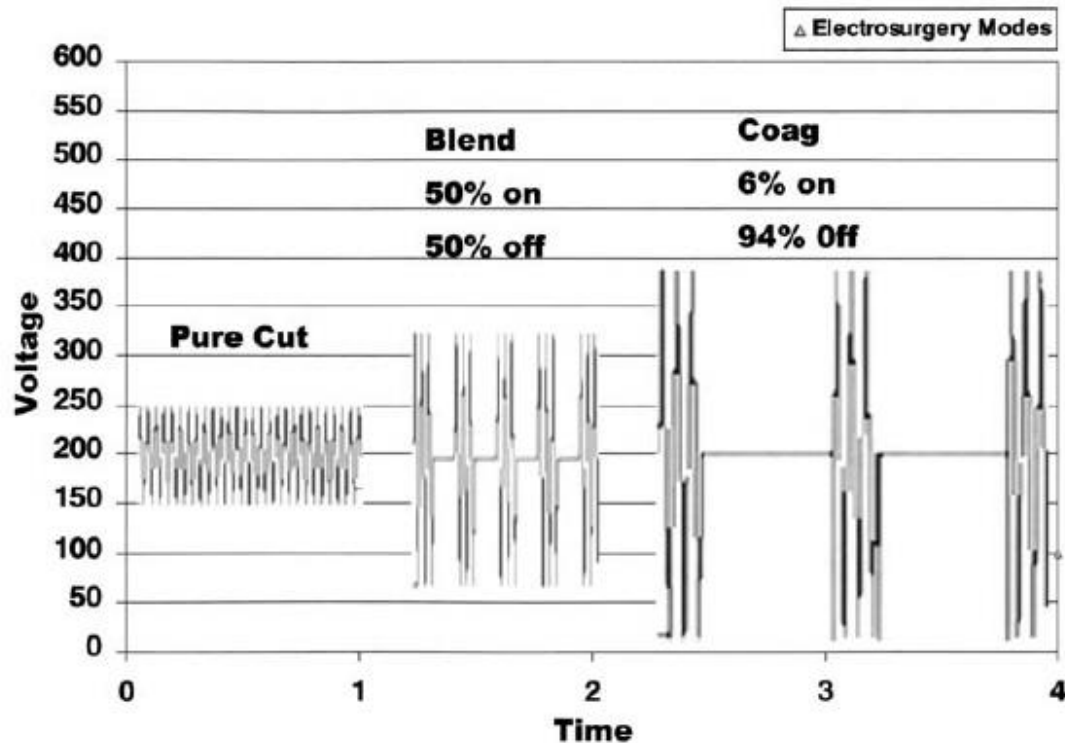
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Electrosurgical Units (ESU)

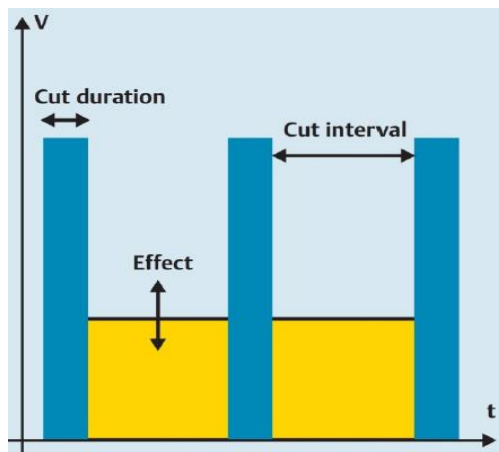
- **절단** : 전류밀도가 충분하여 세포 내의 수분이 급격히 가열되고 끓어
세포막 파열이 발생하는 경우
→ 200 V 이상의 고압전류를 연속적으로 조직에 보낼때
- **응고** : 적용된 에너지가 적어 열 발생이 서서히 진행되고 충분하지 못할 경우,
세포는 탈수되고 건조되어 응고가 발생
→ 200 V 이하의 전류를 연속적으로 보낼때
→ 200 V 이상의 전류를 간헐적으로 통전시킬때

Electrosurgical Units (ESU)



- Pure cut: 100% duty cycle at volts over 200
- Pure coagulation: intermittent current pulse at a 6% duty cycle
- Blended current: duty cycles ranging from 12% to 80%

Electrosurgical Units (ESU)



Effect : 보통 2-3

Cut Duration

Cut duration	ENDO CUT I max. 550 Vp	ENDO CUT Q max. 770 Vp
1	8 ms	2 ms
2	16 ms	6 ms
3	24 ms	10 ms
4	32 ms	14 ms

Cut Interval

Stage	ms
1	400
2	560
3	720
4	880
5	1040
6	1200
7	1360
8	1520
9	1680
10	1840

Electrosurgical Units (ESU)

Cutting mode of VIO 300D

Auto Cut



ICC200 Endocut 기능을 끈 상태와 유사

High Cut



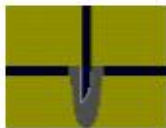
내시경실 해당사항 없음 (비뇨기과용)

Dry Cut



기존 방식보다 지혈 효과 강화

Precise Cut



내시경실 해당사항 없음 (신경외과용)

Endo Cut I



ESD, EST

Endo Cut Q



EMR, ESD – Spark가 섬. 지혈 효과 우수

Electrosurgical Units (ESU)

Coagulation mode of VIO 300D

Soft Coag

(부드러운 지혈)



천천히 균일한 지혈, EMR에서 느리지만 확실한sealing 효과

-Hot biopsy,약한Coag E6/80w

Swift Coag

(신속한 지혈)



Cut을 위한 (빠른)Coag

-EMR에서 Submucosal dissection E5/40w

Forced Coag

(일반적인 지혈)



전통적인 지혈 모드

- 일반적인(Olympus와 유사) 지혈, Hot biopsy E2/40w

Spray Coag

(비접촉식 지혈)



비접촉식 지혈-매우 강하다/전기 스파크가 3mm 정도 발생 - Marking E1/25w

Twin Coag

(동시 지혈)



CS용 특수 모드





Precise Coag

(정밀한 지혈)



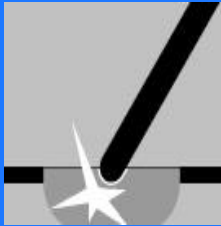


NS용 특수 모드

Electrosurgical Units (ESU)

3a Polypectomy – 5mm			
Guide/ Progs.	Monopolar receptacle		 
Mode	ENDO CUT Q Effect : 2-3 Duration : 2-3 Interval : 3-6		Mode Forced COAG
Effect	3 Upmax:770Vp 		Effect 2 Upmax:1100Vp 
Cut Duration	Cut Interval	Max.watts 40	
1	6		

Electrosurgical Units (ESU)

3a Polypectomy – 10mm			
Guide/ Progs.	Monopolar receptacle		
Mode	Effect : 2-3 Duration : 2-3 Interval : 3-6		Mode
ENDO CUT Q	Forced COAG		
Effect	Upmax:770Vp 		Effect
3	Upmax:1100Vp 		6
Cut Duration	Cut Interval	Max.watts	
1	6	80	

Steps to successful polypectomy

- **Locate** of the polyp
- Analyze the polyp's **shape**
- Determine the polyp's **size**
- Analysis of the polyp **surface**
- **Determine the number** of polyps : **one stage or two stage**
- **Position** the polyp before attempting its resection
- **Estimate polyp resectability** using endoscopic methods
- Use the **submucosal cushion** (injection-assisted-polypectomy)
- **Appropriate skills** using clips and/or endoloops

Timing for polypectomy

Insertion vs. Withdrawal

- 원칙 : 맹장까지 전체 대장을 파악한 후, 용종제거 시작
 - 용종 절제 직상부에서 암이 발견된다면 헛수고한 셈.
 - 용종 절제 중 공기 주입 → 추후 내시경 진입이 어려워짐.
 - 삽입 중에는 루프 형성 경향 → 뺄 때는 루프가 풀려서 유리.
- 단, 용종을 다시 발견하기 어렵다고 판단되면 바로 절제
 - 너무 작은 용종, 주름뒤에 숨은 용종.
 - 생검 검자나 색소로 표시한 후, 나중에 절제할 수도 있음.

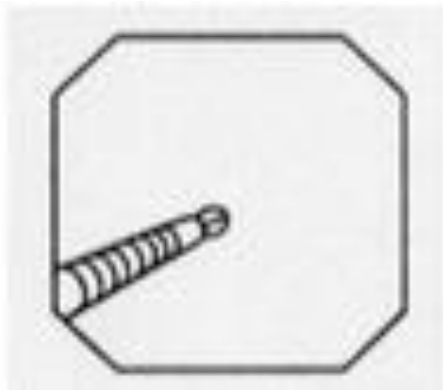
Estimate polyp resectability

- **Hardness**
- **Erosion, ulcer**
- **Non-lifting**
- **Fold convergence**
- **Polyp on polyp appearance**
- **Loss of air-induced deformity**

Positioning for polypectomy

- **용종이 내시경 화면의 5 ~ 6시 방향**(겸자공 위치)에 오도록 내시경 선단부 조작.
- 환자의 체위 조절 또는 복부압박
- Retroflexion이 필요할 수도.
- 용종이 물에 잠기지 않게.
- 유경성 용종의 경우, 장벽에서 떨어지도록
: head가 중력방향에 위치하도록

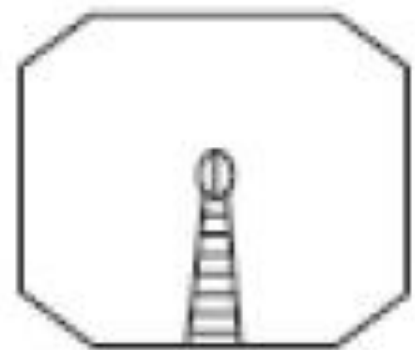
GIF



2T



PCF



Appropriate submucosal injection

- 편평한 병변을 용기-> 올가미 포획이 쉽게.
- 전층 응고 화상과 천공 예방.
- Tampon 효과로 출혈 예방.
- 유경성 용종: 용액 주입으로 경부를 곧게 펴 준다.
- 악성 병변: 주위 조직을 충분히 포획-> 완전 절제 가능.
- **점막하 주입을 적극적으로 고려해야 하는 경우**
 - 큰 용종, 경부가 굵은 용종: 전류가 많이 필요.
 - 편평형 종양으로 분할절제 고려할 때
 - 우측 결장이나 맹장처럼 장벽이 얇은 부위.

“대부분의 경우에서, 점막하 용액 주입은 장점이 많다.”

Appropriate skill


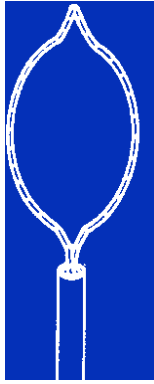


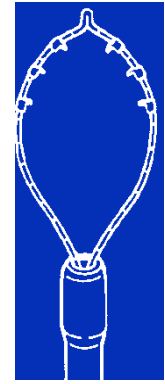
- Cold biopsy polypectomy
- Hot biopsy polypectomy
- Cold snaring polypectomy
- Hot snaring polypectomy
- Endoscopic mucosal resection (EMR) : en bloc vs. piecemeal
- EMR- Precutting (EMR-P)
- Endoscopic submucosal dissection

Appropriate skill using accessory

- Snare
- EndoLoop (Detachable snare)
- Cap-fitted colonoscopy
- Clips

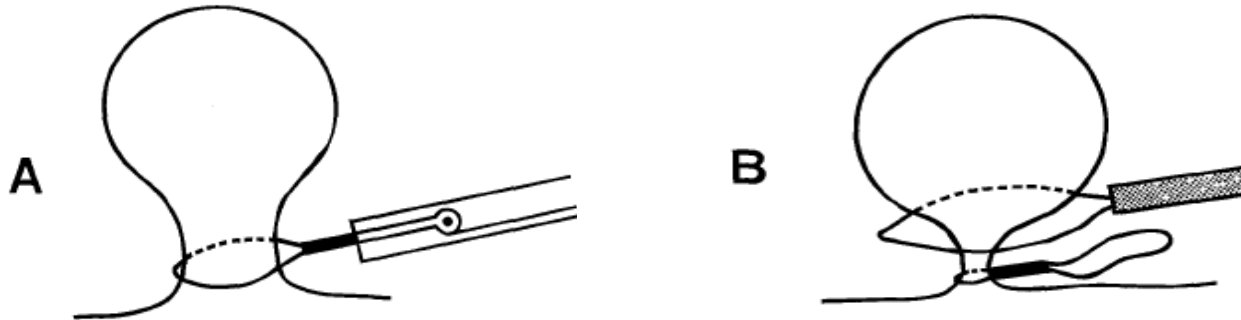
Snare



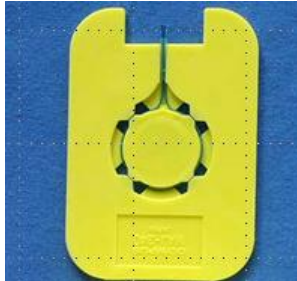
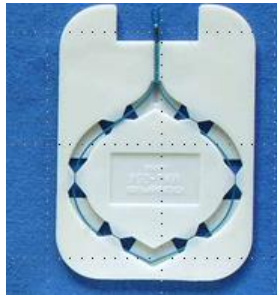

Olympus

Shape	Oval	Mini-oval	Crescent	Hexagonal	Spike (with thorns)
					
Model	SD-9U-1	SD-12U-1	SD-7P-1	SD-6L/U,8P	SD-16L,U/17U
Insertion portion diameter (mm)	2.6	2.6	1.8	2.3 / 1.8	2.6 / 2.6
Working length (mm)	2300	2300	1900	1650 / 1900	1650 / 2300
Loop diameter (mm)	25	15	23	22 / 23	25 / 15
Diameter of wire (mm)	0.47	0.47	0.3	0.4 / 0.3	0.43

EndoLoop (Detachable snare)

경부가 굽은 유경성 용종 : 출혈예방에 유리

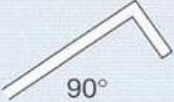
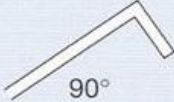
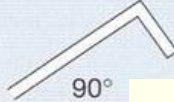
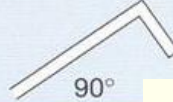
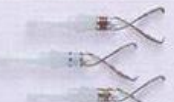













Model					
MAJ-339		MAJ-340		MAJ-254	
					
Loop diameter (mm)					
13		20		30	

Cap-fitted colonoscopy



Clips

	HX-610-090SC	HX-610-090S	HX-610-090	HX-610-090L
Exterior of jaw angle	 90°	 90°	 90°	 90°
Clip arm length	 Short	 Short	 Standard	 Long
Color code	Red / White / Yellow	White	Yellow	Blue
Quantity per box	24	40	40	40

	HX-610-135XS	HX-610-135S	HX-610-135	HX-610-135L
Exterior of jaw angle	 135°	 135°	 135°	 135°
Clip arm length	 Super Short	 Short	 Standard	 Long
Color code	Gray	Green	Pink	Purple
Quantity per box	24	40	40	40

Arm Length	5 mm	6 mm	8 mm	10 mm
Opening	7 mm	8.3 mm	10 mm	12.3 mm

Conclusions

- **Be faithful to the basics !!**

- **Good bowel preparation**

- Appropriate setting and preparation of ESU

- **Timing** for polypectomy : insertion vs. withdrawal

- Evaluation polyp size and shape → Estimate **resectability**

- Positioning for polypectomy

- : 5-6시 방향, retroflexion, 복부압박, cap-fited

- Appropriate submucosal injection : 근위부 부터

- Appropriate skill using accessory

- : 적절한 올가미로 적절한 위치에, EndoLoop, clip, cap-fited

Conclusions

- Know your limits
- Know the limits of your instruments
- Be able to cope with complications
- If you are not sure you can complete the procedure,
Do not start !!!

Inflammatory Bowel Diseases

Young-Ho Kim

Sungkyunkwan University School of Medicine

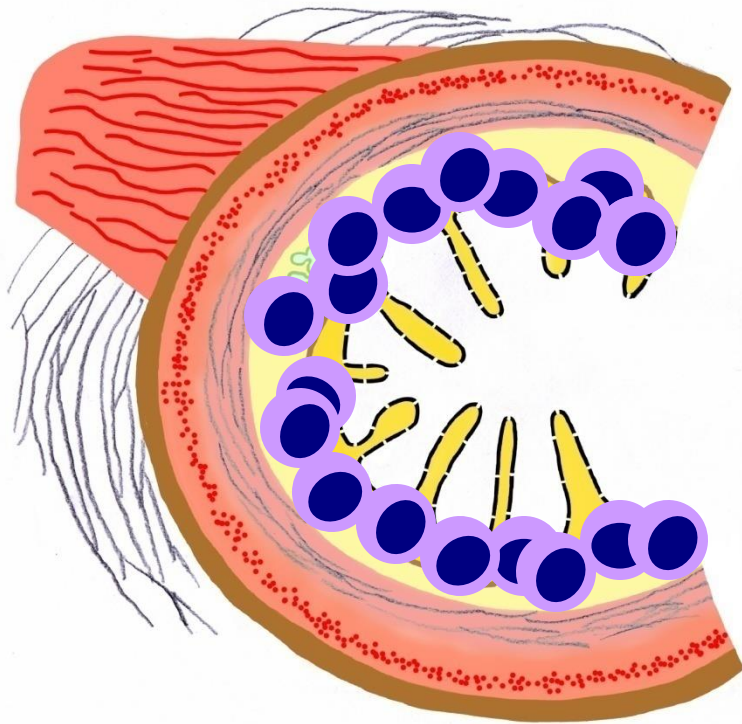
Definition of Inflammatory Bowel Disease (IBD)

- Chronic idiopathic inflammatory diseases of the gastrointestinal tract
- No single finding is absolutely diagnostic.
- Diagnosed by a set of clinical, endoscopic, radiologic and histologic characteristics

Ulcerative Colitis vs Crohn's Disease

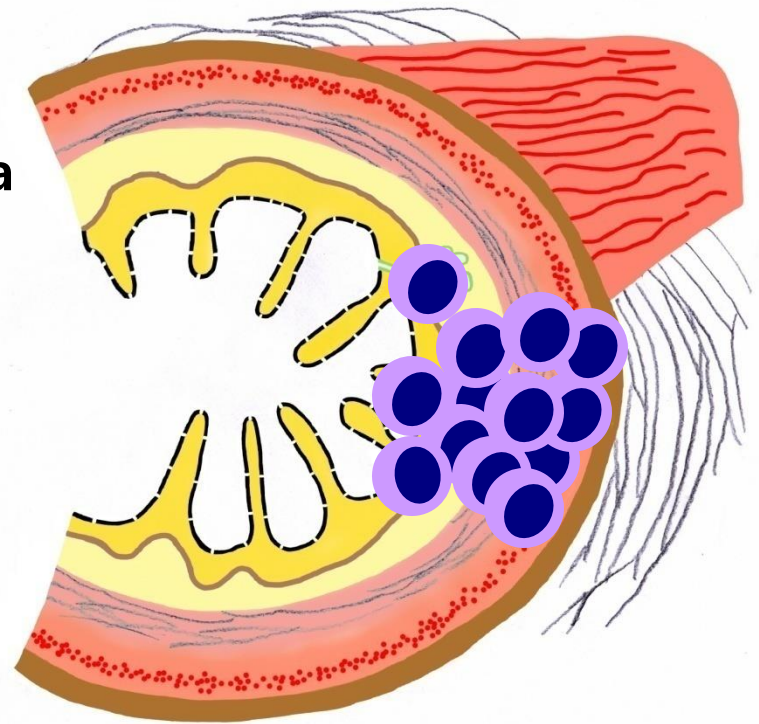
Ulcerative colitis (UC)	Crohn's disease (CD)
Superficial Confined to mucosa and submucosa	Transmural from mucosa to serosa
Continuous lesions from rectum, confined to colon	Skipped lesion from esophagus to rectum
Colectomy is curative.	Operation is not curative.

UC vs CD



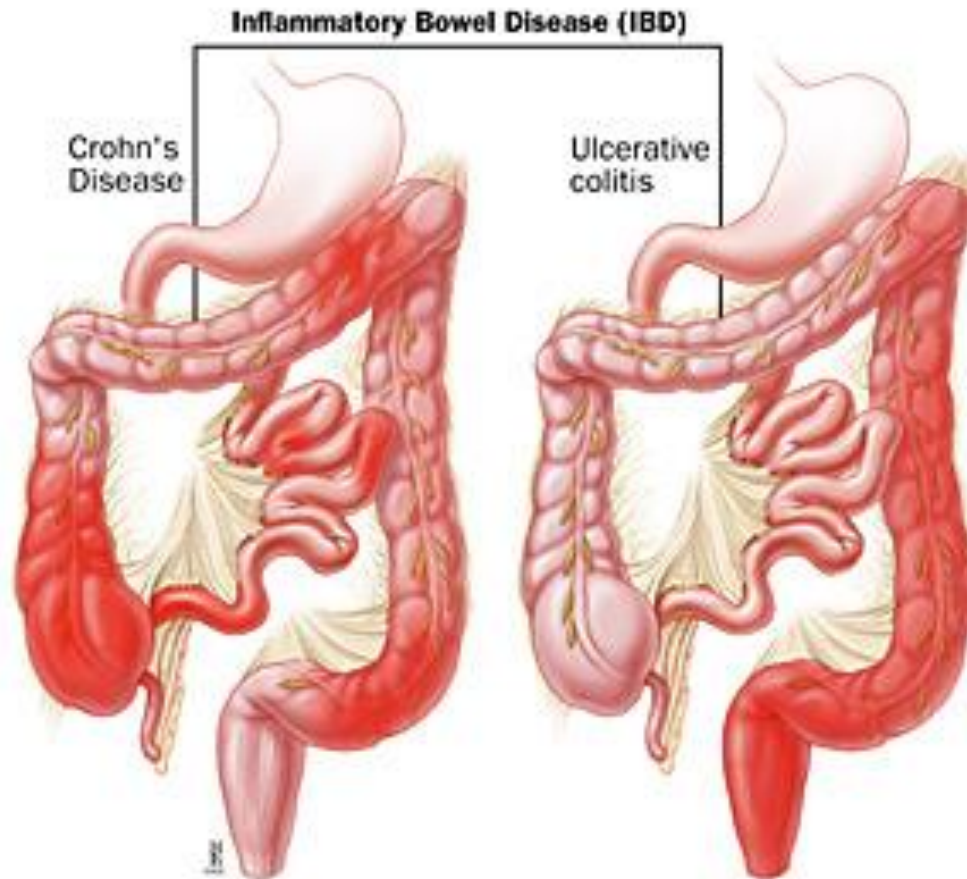
UC

muscle
submucosa
mucosa



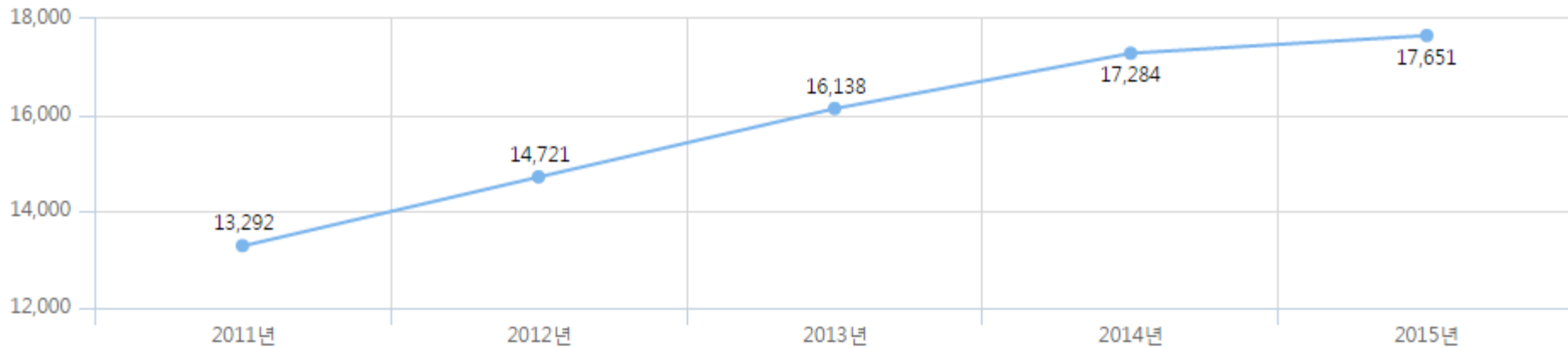
CD

UC vs CD

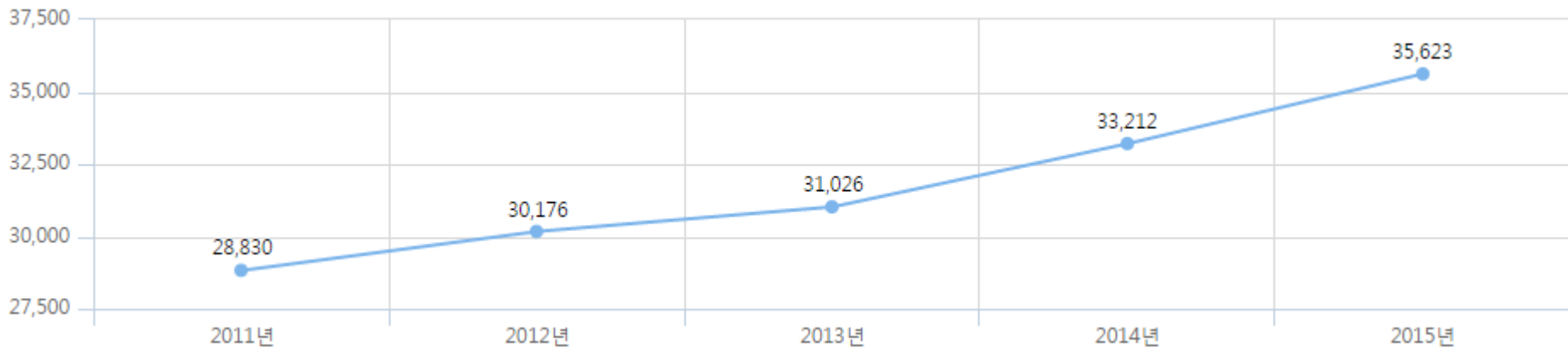


연도별 환자 수 추이

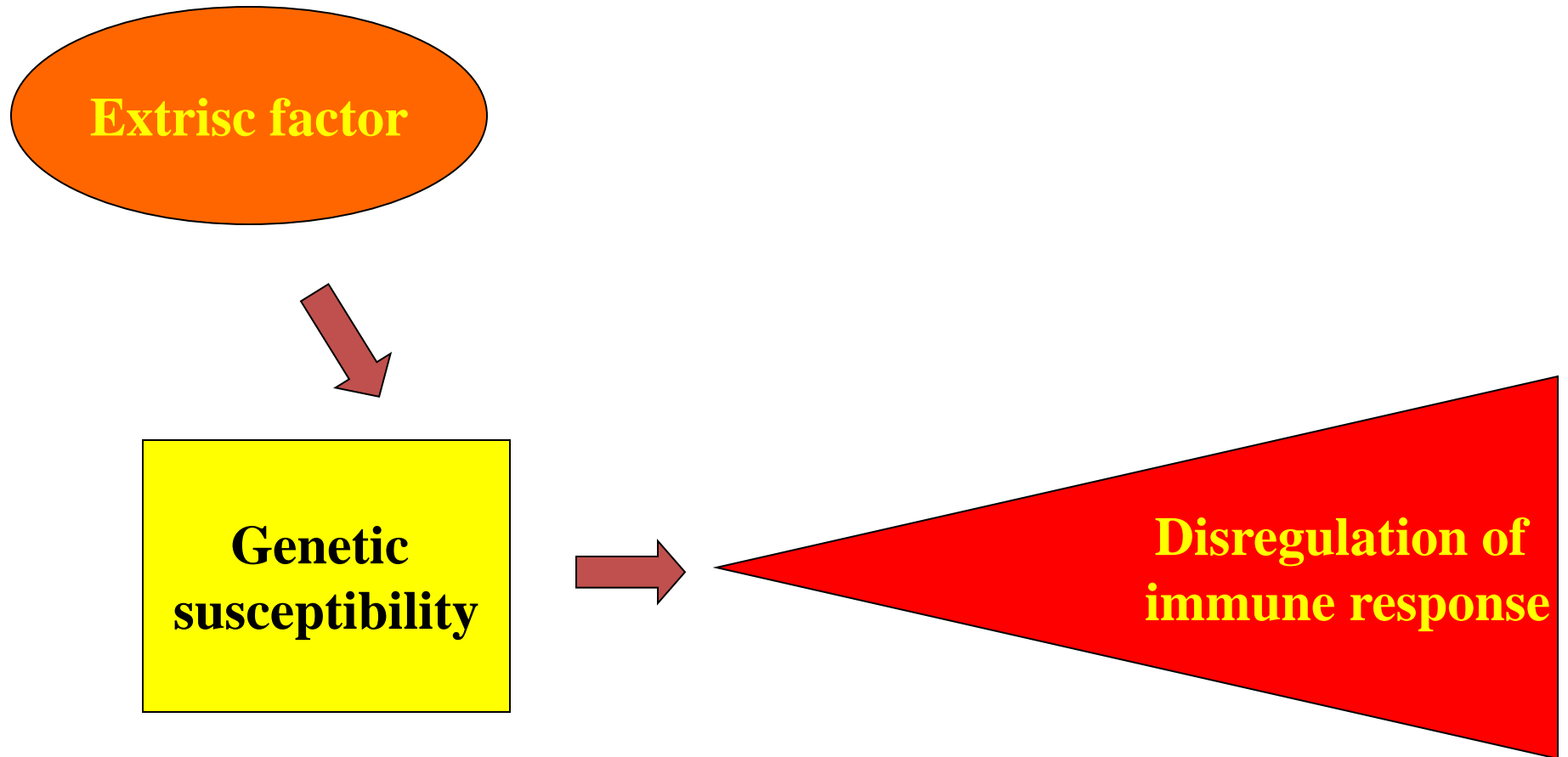
크론병



궤양성 대장염



Pathophysiology



Endoscopic Findings of UC

- 직장에서 시작하여 대장 근위부로 진행하는 연속적이고 대칭적인 염증 병변으로 정상 부위와 경계가 명확하다.
- 경도의 질환에서는 혈관 투견상의 감소, 발적, 과립상 점막 변화 및 경도의 점막 유약성 등이, 중등도의 질환에서는 혈관 투견상의 소실, 심한 발적, 중등도의 유약성 및 미란, 작은 궤양, 점측 출혈, 점액 및 혈변 부착 등이, 중증의 질환에서는 광범위한 궤양, 뚜렷한 자연 출혈 등이 관찰된다.

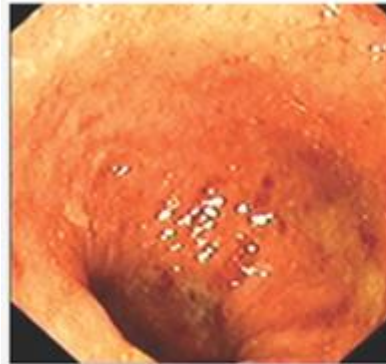
Mayo Endoscopic Subscore



0 Normal or inactive disease



1 Mild disease (erythema, decreased vascular pattern, mild friability)



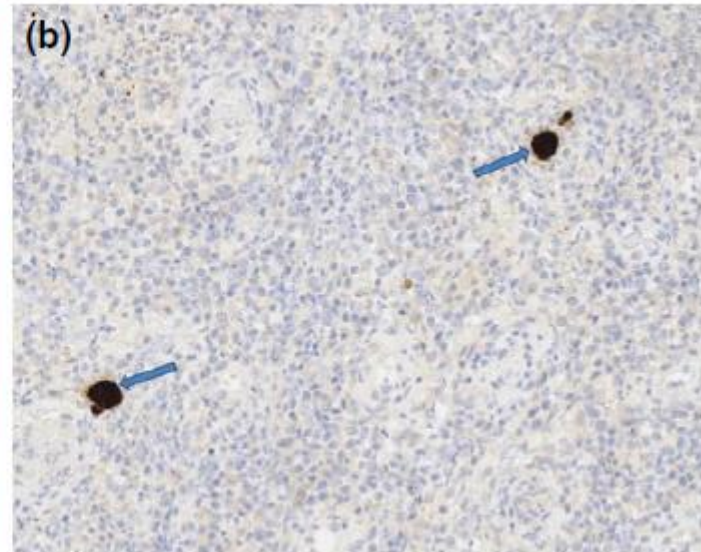
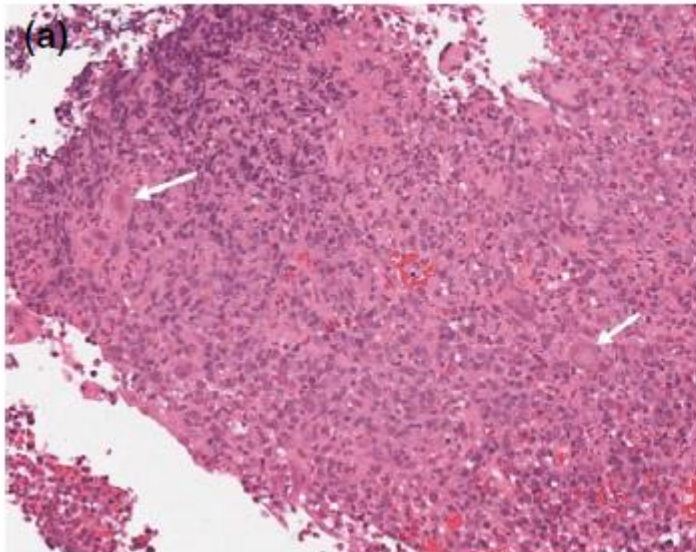
2 Moderate disease (marked erythema, absent vascular pattern, friability, erosions)



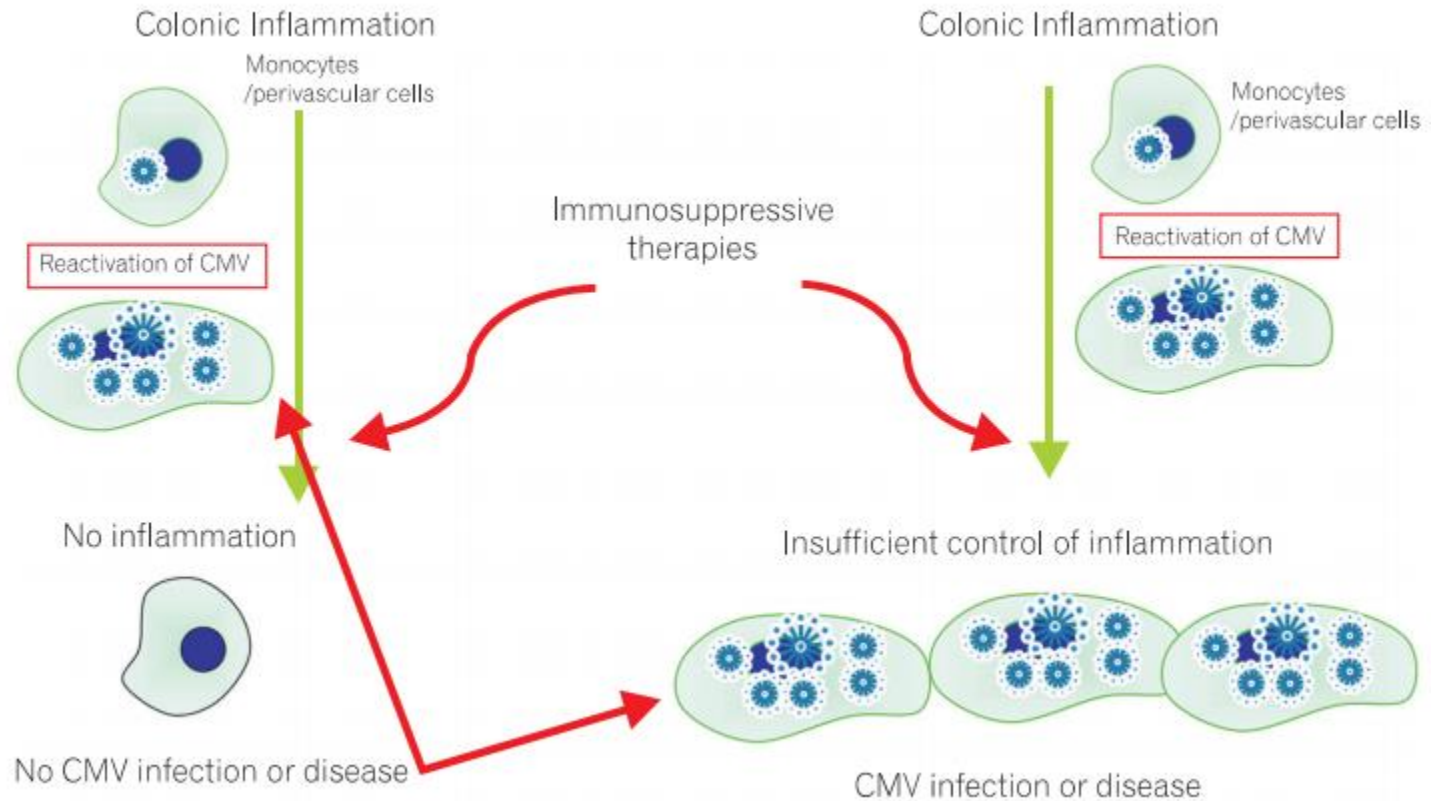
3 Severe disease (spontaneous bleeding, ulcerations)

Cytomegalovirus (CMV) in IBD

- There were no features that were diagnostic of CMV infection, but 'punched-out ulcers' and 'geographic ulcers' were more common in steroid-refractory patients' with CMV



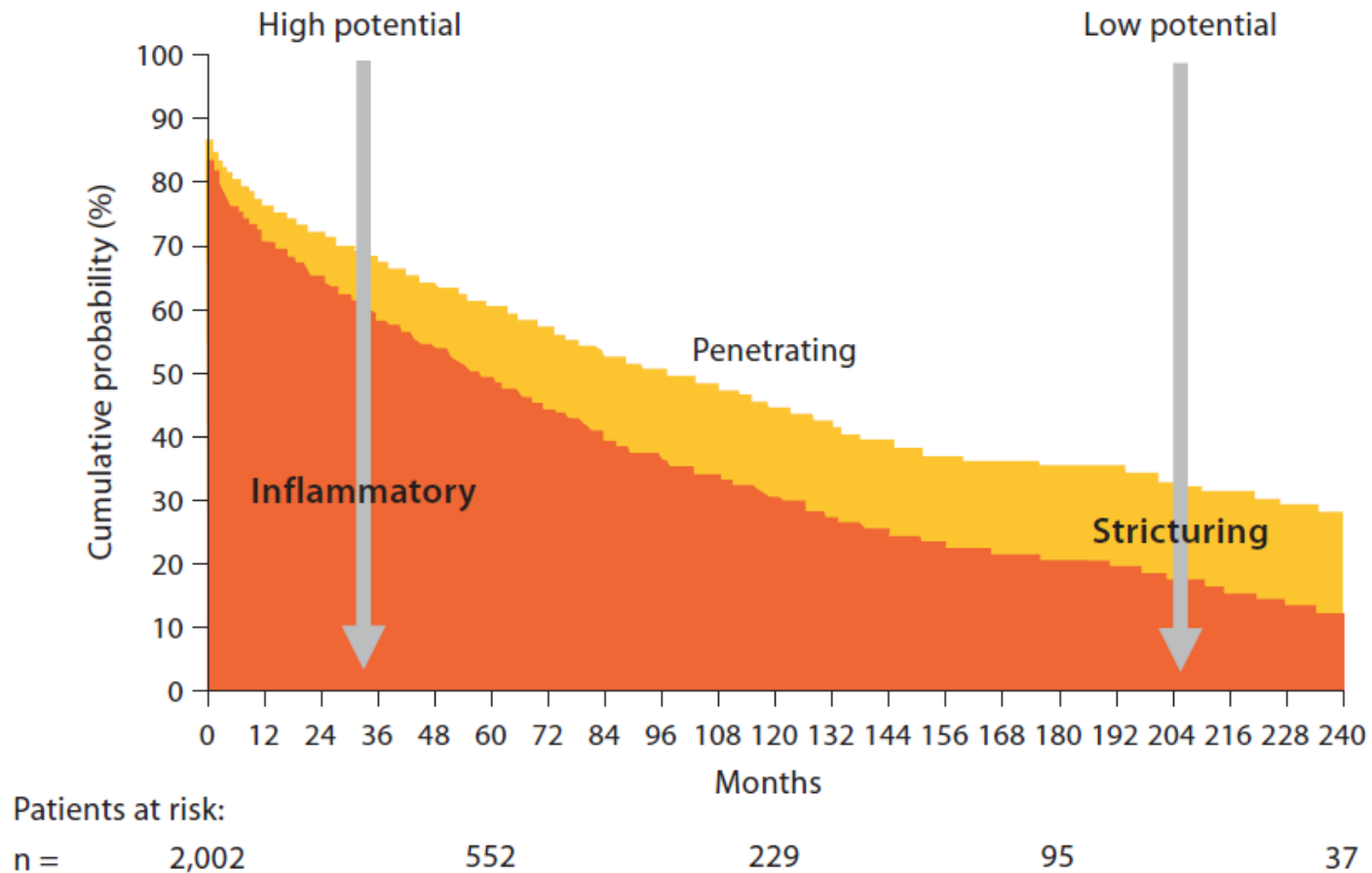
Cytomegalovirus (CMV) in IBD



Endoscopic Findings of CD

- 직장을 침범하지 않는 경우가 많고 건너 뛰기 병변(skip lesion)을 보인다.
- 구강에서 항문까지 어디에서나 발생할 수 있으나 회맹부가 가장 호발하는 부위이다.
- 종주로 배열된 아프타 궤양(aphthous ulcer), 종주 궤양(longitudinal ulcer), 또는 조약돌 점막 모양(cobblestone mucosal appearance) 등이 비연속적으로 나타난다.

Natural Course & Impact of Therapy in Crohn's Disease



Diagnosis of Tuberculous Colitis_Korean Guideline

Abd. pain, diarrhea, wt. loss
Chronic ileo-colonic inflammation

Not confirmed at mucosal biopsy or culture
TB not identified at an extra-intestinal site

- Previous TB history
- TB pts. contact history
- Abnormal chest X-ray
- Characteristic CFS findings (4 findings)
- Suspected TB histology
- TB tissue PCR positive
- Positive test for latent TB (TST ± IFN γ assay)
- Abdominal imaging with features of TB

Definite Intestinal TB

- Caseating granulomas or AFB on mucosal bx.
- TB tissue culture(+)

Empiric anti-TB tx. for 2 months

- TB tissue culture(+) and/or
- Clinical improvement
- Endoscopic improvement
- Inflammatory markers ↓

Probable Intestinal TB

- Continue TB therapy

- TB tissue culture(-)
- Poor clinical response
- No endoscopic improvement
- Inflammatory markers ↑

Re-evaluate

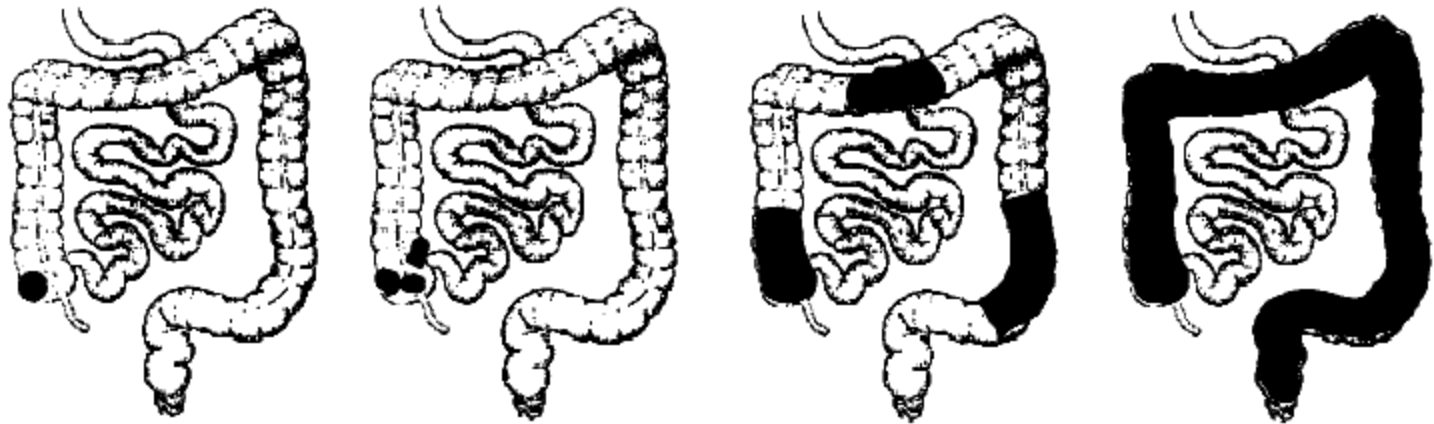
- Delayed response
- Resistant to drug
- **Other disease (CD)**

Behçet's Disease

. International Study Group for Behçet's Disease criteria for diagnosis of Behçet's disease

Recurrent oral ulceration <i>Plus 2 of:</i>	Minor aphthous, major aphthous, or herpetiform ulceration observed by physician or patient, which recurred at least 3 times in one 12-mo period
Recurrent genital ulceration	Aphthous ulceration or scarring observed by physician or patient
Eye lesions	Anterior uveitis, posterior uveitis, or cells in vitreous on slit-lamp examination; or retinal vasculitis observed by ophthalmologist
Skin lesions	Erythema nodosum, observed by physician or patient, pseudofolliculitis, or papulopustular lesions; or acneiform nodules observed by physician in postadolescent patients not taking corticosteroid treatment
Positive pathergy test	Read by physician at 24–48 h

Behçet's Disease



Localized single

Localized multiple

Multi-segmental

Diffuse

Typical BD	27 (64%)	12 (29%)	1 (2%)	2 (5%)
Atypical BD	36 (69%)	13 (25%)	1 (2%)	2 (4%)
Total	63 (67%)	25 (27%)	2 (2%)	4 (4%)

FIG. 2. The distribution pattern of lesions in intestinal Behçet's disease.

Lee CR, et al. Inflammatory Bowel Disease 2001;7:243

Infectious Colitis

- Regardless of the etiology, clinical symptoms are quite similar.
- It is hard to prove the existence of pathogens.
- Patients whose symptoms have not improved within 1 week should undergo a sigmoidoscopy or colonoscopy.

Infectious Colitis

- Symptoms
 - acute onset
 - fever, vomiting, abd pain, frequent bowel movement
- Endoscopy
 - severe hyperemia, profuse exudate
 - rectal sparing, patchy distribution

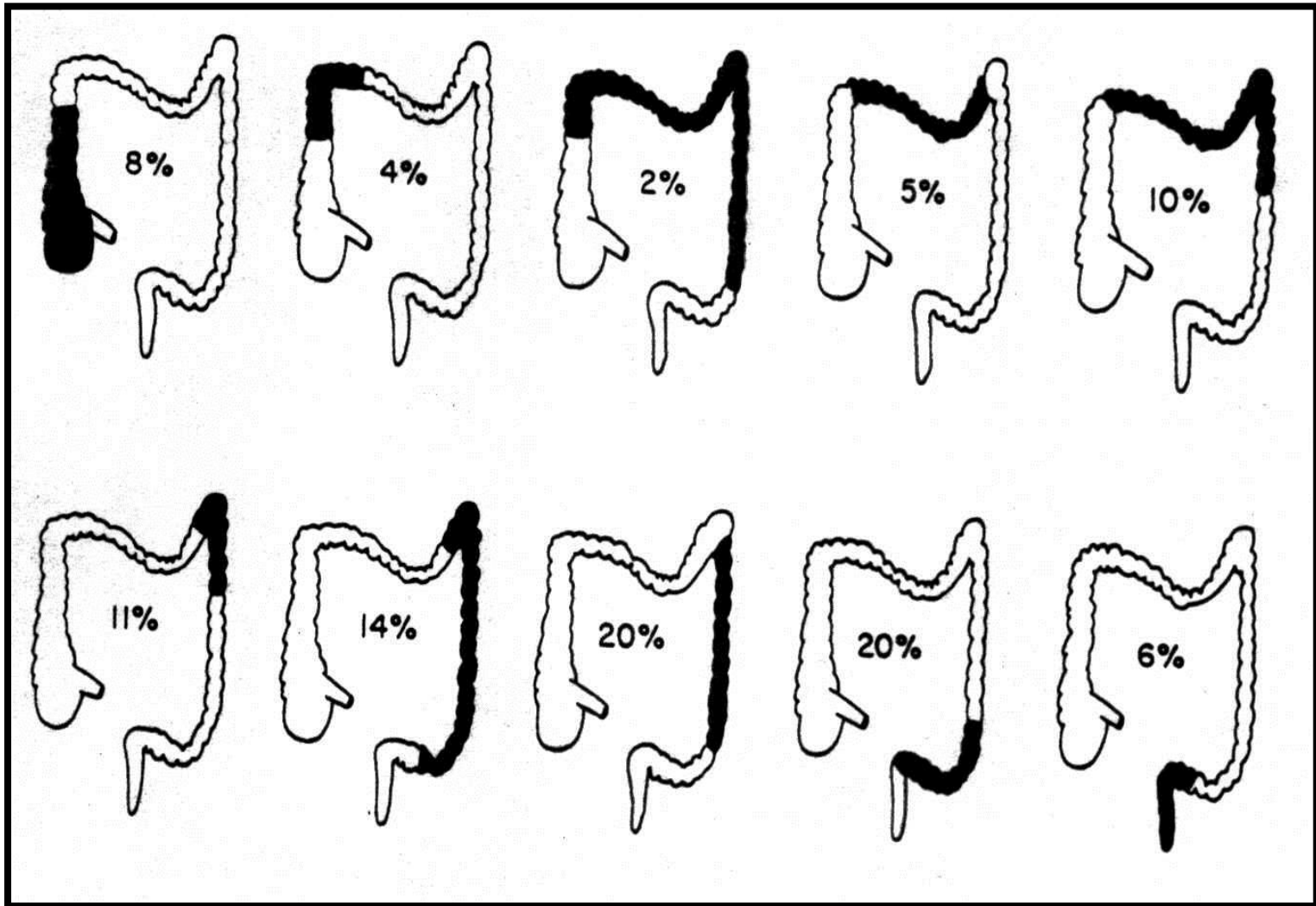
Colonoscopic Findings of Infectious Colitis

- UC (ulcertive colitis)-like
 - Shigella, Salmonella, Campylobacter, Amoeba
- CD (Crohn's disease)-like
 - Salmonella, Campylobacter, Yersinia, Amoeba

Ischemic Colitis

- Old age
- Sudden onset of abdominal pain & hematochezia
- Endoscopy
 - hyperemia, edema, ulceration
 - rectal sparing
 - resolved within 1-2 weeks
 - Bx : coagulation necrosis

Distribution of Ischemic Colitis



Radiation Colitis

- Radiation history due to cervix ca or prostatic ca
- Endoscopy
 - proximal rectum & distal sigmoid colon
 - mucosal friability
 - granularity with spontaneous bleeding
 - multiple telangiectasia

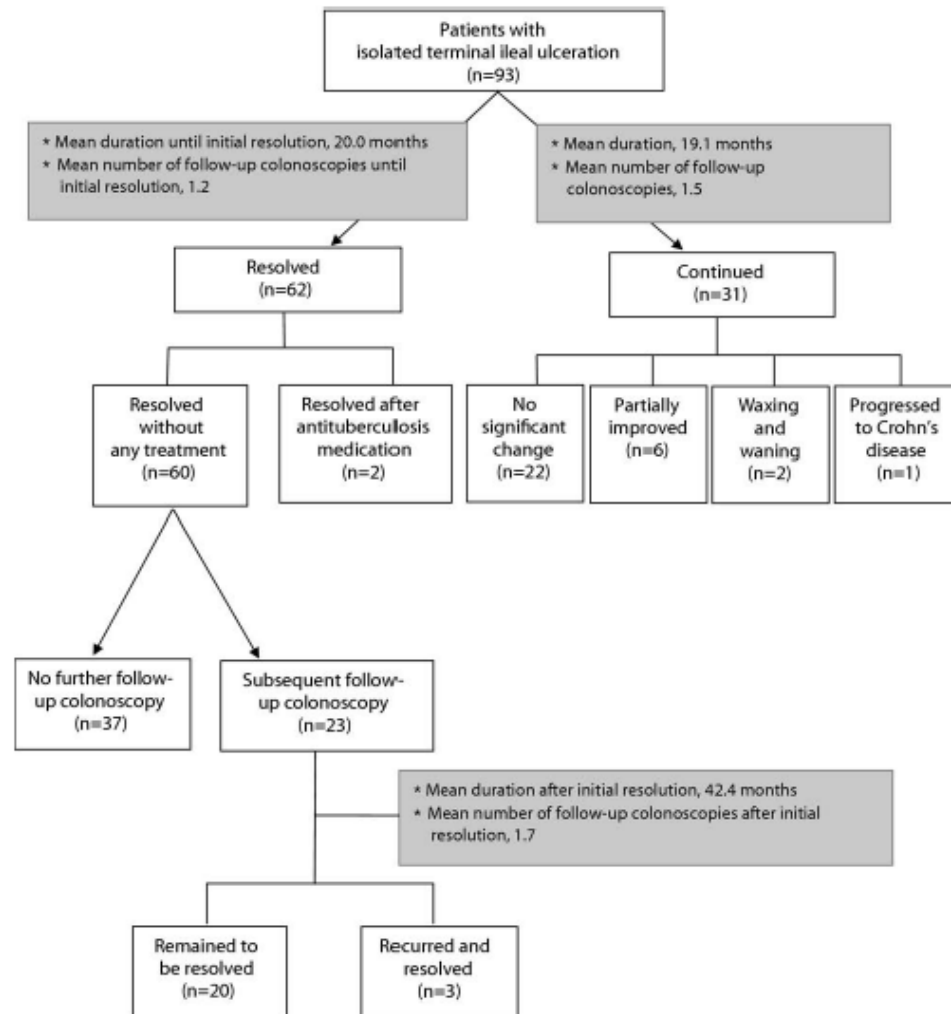
Solitary Rectal Ulcer Syndrome

- A chronic course characterized by rectal bleeding, disordered defecation, tenesmus and mucorrhea
- Endoscopy
 - anterior wall, 4 to 15 cm from the anal verge
 - shallow ulcers with white, sloughy base surrounded by a thin rim of erythematous mucosa

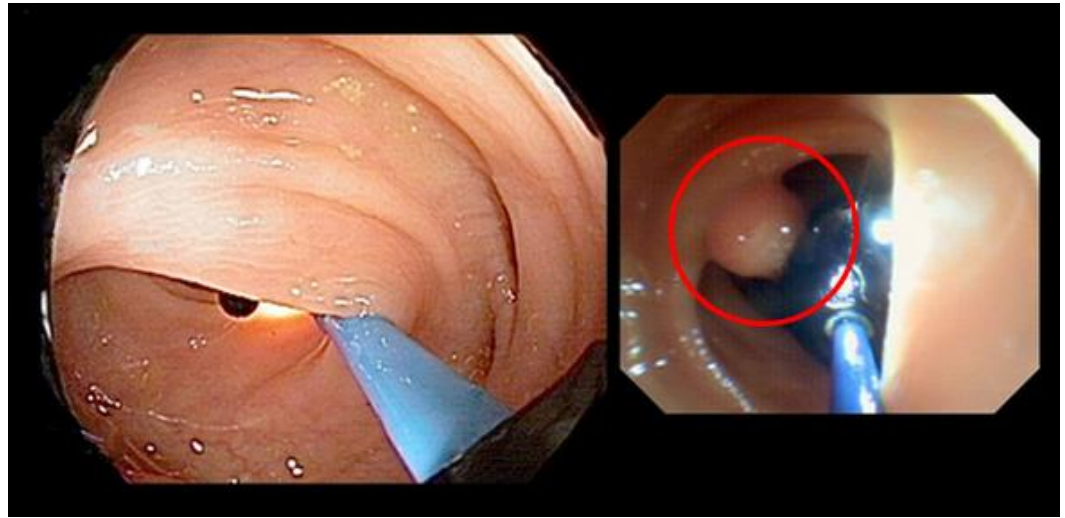
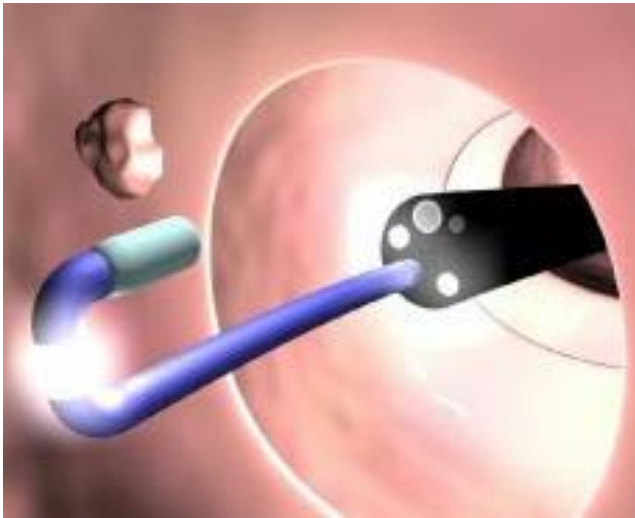
Solitary Rectal Ulcer Syndrome

- Histology
 - characteristic
 - obliteration of lamina propria by fibromuscular proliferation of the muscularis mucosa
 - streaming of fibroblasts and muscle fibers up between crypts
 - thickening of muscularis mucosa
 - branching, distorted glandular crypts
 - diffuse collagen infiltration of lamina propria

Isolated Terminal Ileal Ulcer



Retroview? Third Eye Retroscope



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April/May 2006

Five Year Anniversary

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SMC 내시경실 환자 안전

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내시경실의 안전 이대로 괜찮은가?

뒷

환자안전사고

발생

open

- 이미지 추락
- 문책, 질책
- 보고서, 시달서
- 자신감 저하

- 문제점 공유
- 개선대책 마련
- 대책 적용
- 재발 가능성 ↓

내시경실 환자안전 가장 큰 이슈 - 진정 & 약물중단

* 항혈소판제, 항응고제 중단

TABLE 12. Best practice recommendations for the management of DAPT³⁶

Avoid cessation of all antiplatelet therapies after PCI with stent placement.

Avoid cessation of clopidogrel (even when aspirin is continued) within the first 30 days after PCI and either DES or BMS placement when possible.

Defer elective endoscopic procedures, possibly up to 12 months, if clinically acceptable from the time of PCI to DES placement.

Perform endoscopic procedures, particularly those associated with bleeding risk, 5-7 days after thienopyridine drug cessation. ASA should be continued.

Resume thienopyridine and ASA drug therapy after the procedure once hemostasis is achieved. A loading dose of the former should be considered among patients at risk for thrombosis.

Continue platelet-directed therapy in patients undergoing elective endoscopy procedures associated with a low-risk for bleeding.

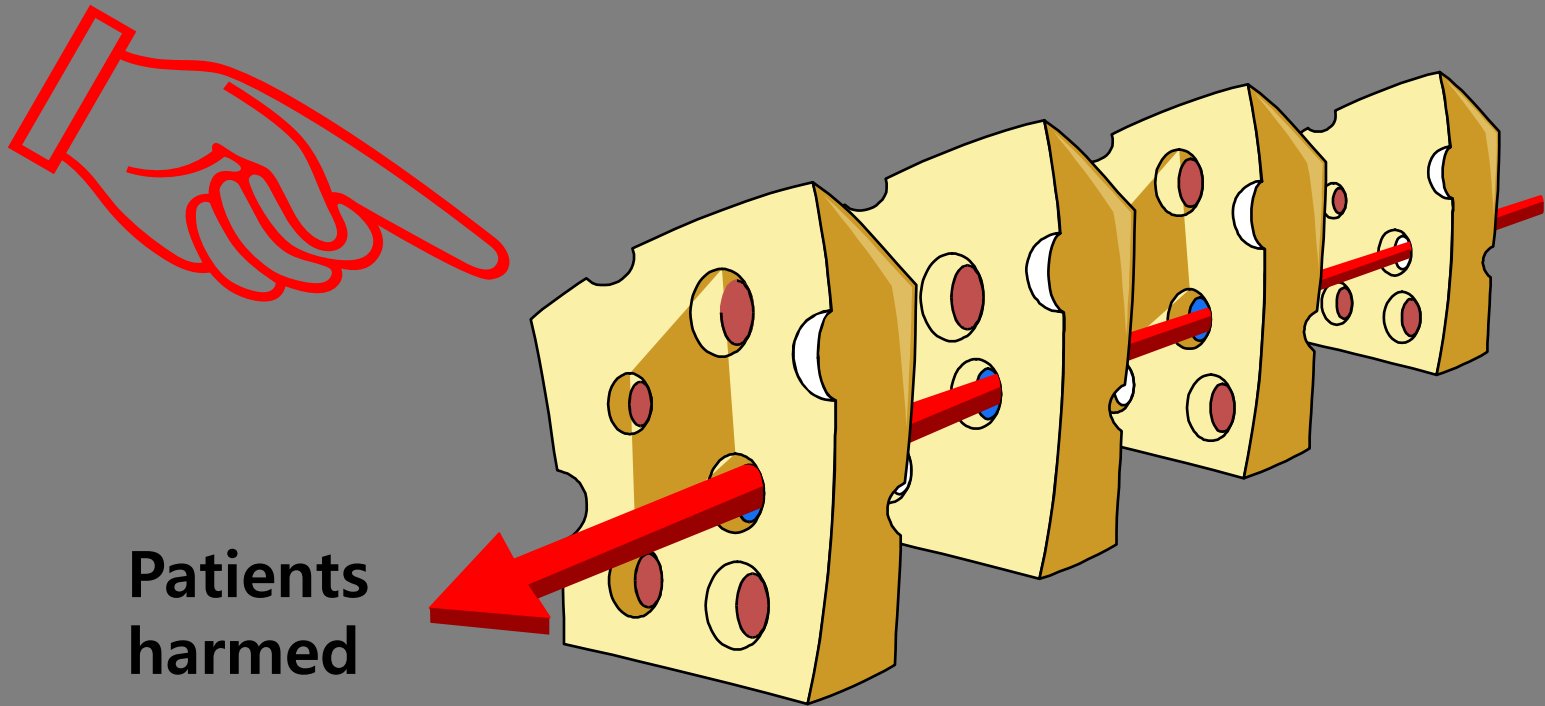
DAPT, dual antiplatelet therapy; *BMS*, Bare metal stent(s); *DES*, drug-eluting stent(s); *PCI*, percutaneous coronary intervention; *ASA*, acetylsalicylic acid, or aspirin.

ASGE Guideline 2016

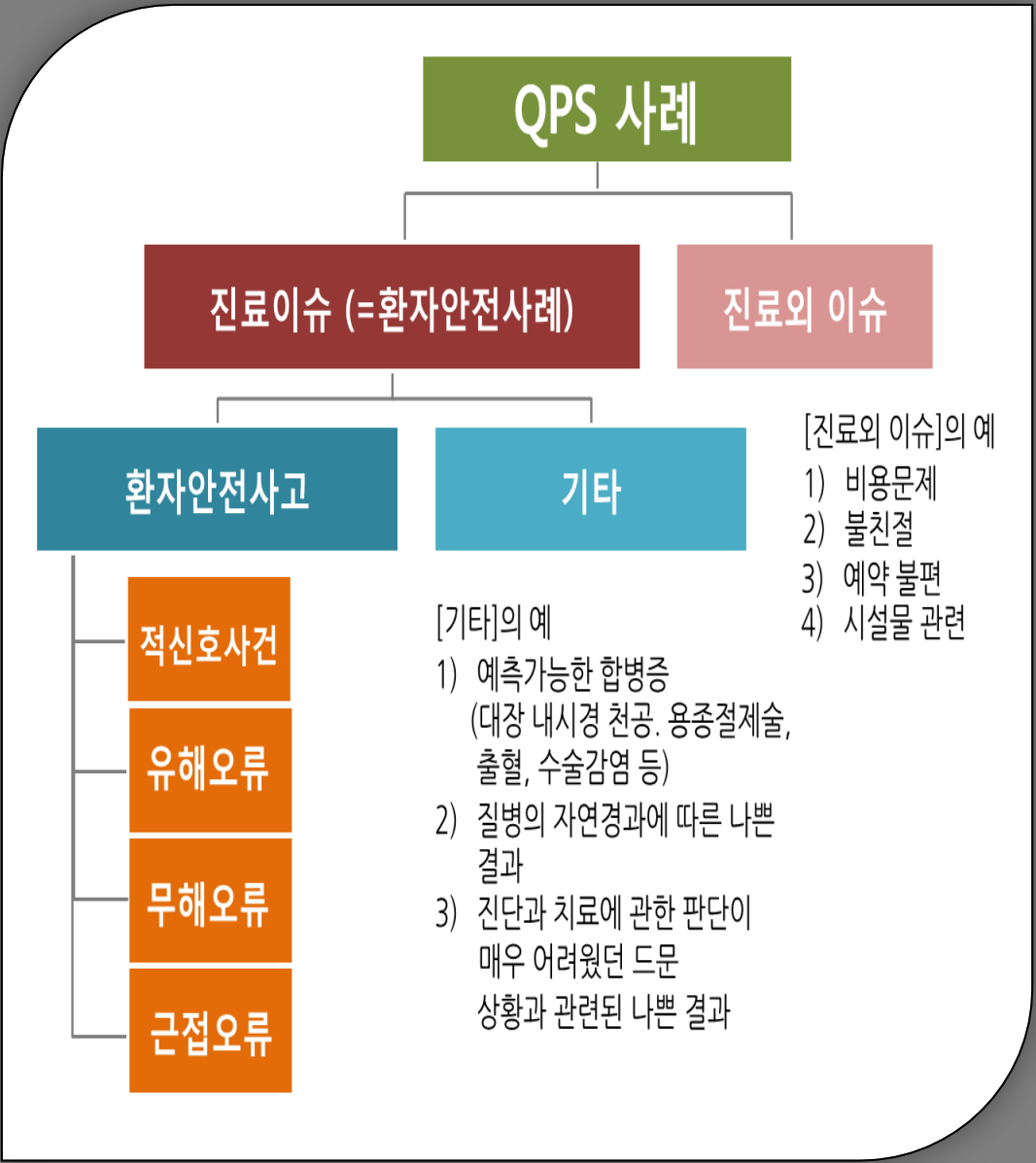
또 다른 이슈들.....

- 고위험 환자(천공, 출혈)
- 낙상
- 검체 (분실 혹은 바뀜)
- 치아손상
- IV
- 찢김사고
- 투약 오류
- 동명 이인
- 이물질 삼킴...

Fingering은 효과가 있을까?



QPS 팀 (Quality & Patient Safety)- CQIS 보고서 SMC



내시경실의 안전사고 발생시 대처 과정

안전팀

- 내시경실의 안전문제(우발증, 환자안전사고) 담당
- 내시경실 질지표 관리
- 팀원은 질지표 관련 교육과정 이수

사고발생

- 안전사고 발생시 소집
- 안전사고를 RCA를 통해 문제 분석, 개선대책 마련

대책실시

- 사건을 전 직원과 공유
- 개선 대책에 대해 전 직원이 함께 실시

사후관리

- 지속적인 QI

근본원인 분석 - RCA(Root Cause Analysis)

RCA란?

오류가 발생한 원인을 상세 분석함으로써
근본원인(Root Cause)을 규명하고
오류의 예방 방법을 발굴하고 알아가는 과정

* 오류에 대한 책임을 묻는 것보다
시스템 및 과정에 초점을 두고
원인 개선

내시경실의 안전사고 : **대응자세** - 고위험 환자

내시경 검사 중 우발증 발생시 대처요령

출혈

내시경 시행 중 활동성 출혈 또는 출혈의 가능성이 높은 병변이 관찰되는 경우

- ① Vital sign check, 최근 lab check (Hb, coagulation profile)
- ② 환자와 보호자에게 설명 (ER refer and 2nd stage endoscopic management)
- ③ ER refer-contact on-call IM1 fellow
- ④ emergency lab check, vital sign monitoring, iv hydration and prn transfusion
- ⑤ 2nd stage endoscopic management or Radiology contact for embolization

천공

내시경시행 중 위장관 천공이 발생한 경우

- ① Vital sign check
- ② Contact senior fellow or staff for immediate closure of perforation with clip (if primary endoscopic closure was impossible, immediately notify to staff in charge and GS contact)
- ③ 환자와 보호자에게 설명 (ER refer and close monitoring)
- ④ ER refer → contact on-call IM1 fellow (emergency lab check, vital sign monitoring, iv hydration and antibiotics)
- ⑤ Notify to on call staff and admission for close monitoring or operation

CPR

내시경시행 중 CPR필요한 상황이 발생한 경우
① 비수면내시경인데 의식저하시
② Nasal O2 사용 중에도 SaO2가 90% 미만인 경우
③ 혈압 또는 맥박이 측지되지 않거나 자발호흡이 없어진 경우

- ① 내시경 검사를 즉각 중단하고 환자를 supine position으로 하고 얼굴은 측면을 향하도록 자세를 취한다.
- ② Mental status, respiration, pulse, BP 를 재확인하고 이상소견 지속시 담당간호사와 내시경실 준비실에 도움을 요청하면서 CPR방송을 의뢰한다.
- ③ 기도를 확보하고 AMBU-bagging 및 cardiac massage시행하면서 CPR을 시행한다.
- ④ CPR종료 후 환자의 상태에 따라 ICU 또는 ER (병동)로 환자를 이송한다.

그 외, 우발증 발생 또는 긴급한 상황발생시 연락처
▪ 민양원 (#8-2293), 김은란 (#8-0080), 내시경실장 : 이준행 (#8-0912)

상황 종료 후 임상조교수, 내시경실장(참조:파트장), 소화기내과 과장에게 싱글멜로 보고한다

연락처
보고

환자안전은 보고와 표준화가 핵심입니다.

실수로부터
배우기

표준화

Independent
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