2015 Winter School

대장 종양성 병변의 진단과 치료

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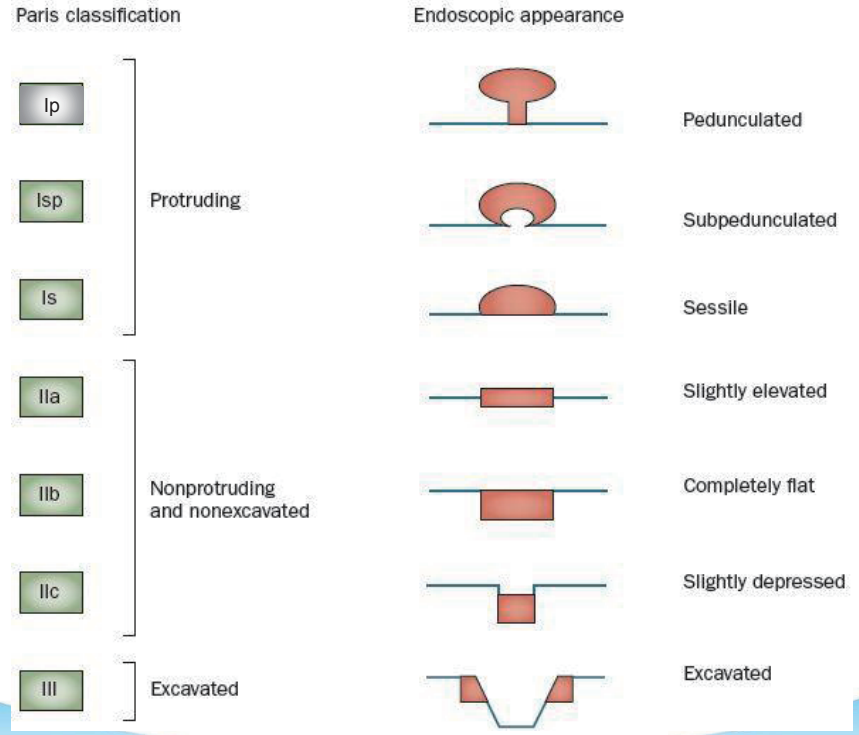
Colon Polyps (Epithelial origin)

Neoplastic	Non-neoplastic
Premalignant polyp	Mucosal tag
Tubular adenoma	Hyperplastic
Tubulovillous adenoma	Inflammatory
Villous adenoma	Juvenile

Carcinoma in situ: D01.0~01.2 (by 2010 AJCC staging)
- High-grade dysplasia
- Intraepithelial cancer (CIS)
- Intramucosal cancer (infiltrating into lamina propria)

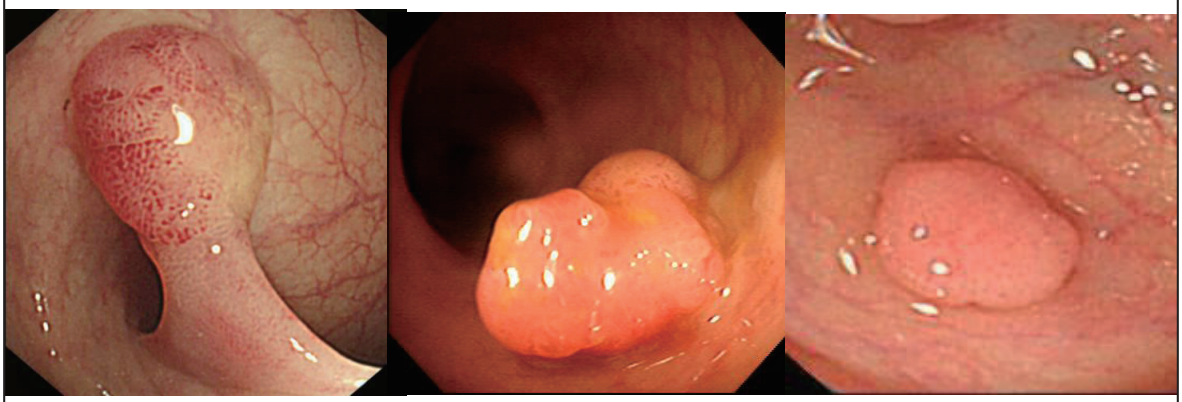
Invasive carcinoma: C18 ~20
- Submucosal cancer (Malignant polyp) –beyond the m.m.

Paris endoscopy classification for superficial (type 0) lesions (tumors with superficial invasion:M,SM)



*Protruding lesions are elevated more than 2.5 mm.

Adenomatous Polyp



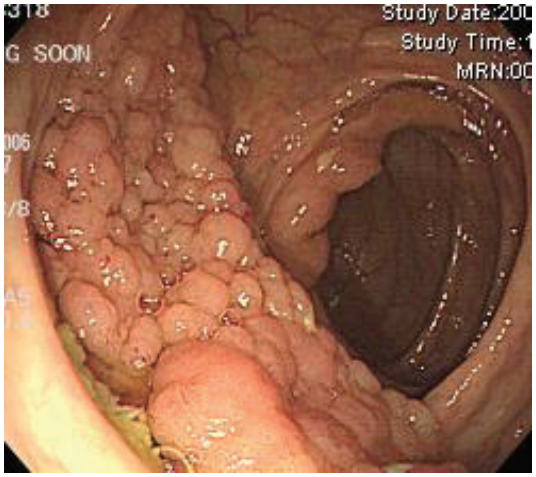
Ip Isp Is

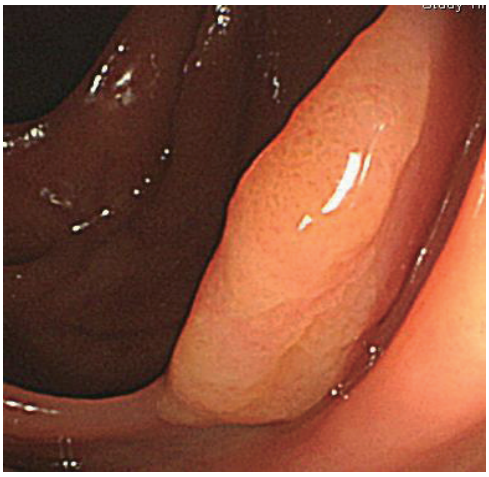
0.2 cm

IIa

LST: Lateral spreading tumor (> 1cm)

G-H (Granular type – Homogeneous) NG-F (flat elevated)





Classification of LSTs

LST-G (granular) 46%

Kudo: LST-G-H (homogeneous)
Paris: IIa 30%

LST-G-M (nodular mixed)
IIa + Is 16%

LST-NG (non-granular) 54%

Kudo: LST-NG-F(flat elevated)
Paris: IIa 41%

LST-NG-PD (pseudodepressed)
IIc + IIa, IIa + IIc 13%

Kudo S. 1993
Kudo S et al. Stomach and Intestine. 2005. 40;1367
Kudo S et al. Gastrointest Endosc 2008;68(S4):S3

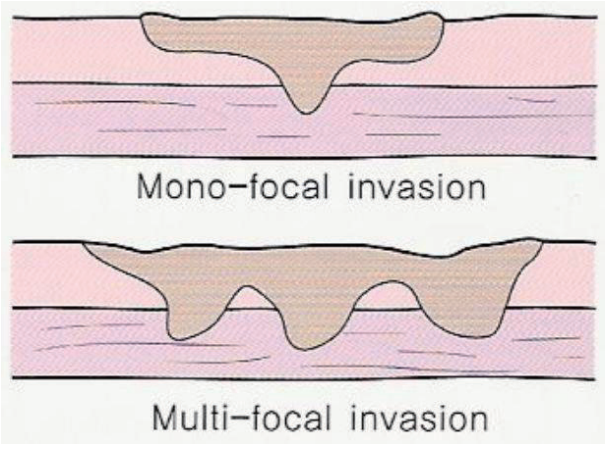
Proportion of M/SM cancers according to the type and the size of the LST

		M/SM	total (%)	< 2 cm(%)	≥ 2 cm(%)
LST-G					
	LST-G-H	M	22.9	13.5	39.5
		SM	1.8	1.0	3.4
	LST-G-M	M	33.5	25.4	38.0
		SM	18.0	5.1	25.0
LST-NG					
	LST-NG-F	M	12.7	11.3	17.9
		SM	4.1	1.9	11.9
	LST-NG-PD	M	23.5	19.6	31.8
		SM	25.0	15.2	45.5

Yamano H et al. Stomach and Intestine. 2007.

Multifocal submucosa-invading cancer

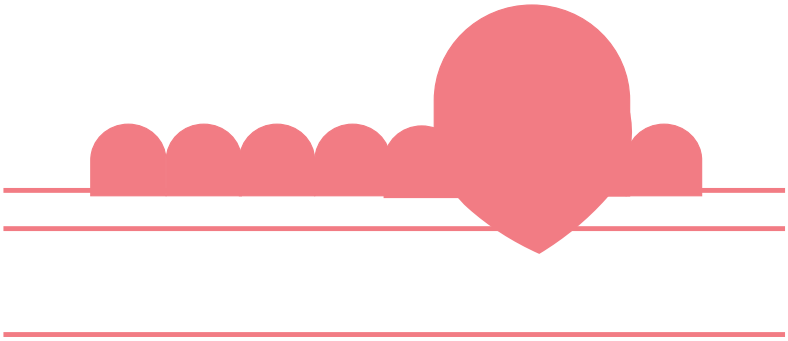
LST-G: 1/7 (14.3%)
LST-NG: 5/20 (25.0%)



Shinji Tanaka 2006. Basic Technique of EMR and ESD for colorectal tumors

LST-G-MN type

An invasive cancer focus in the large nodule



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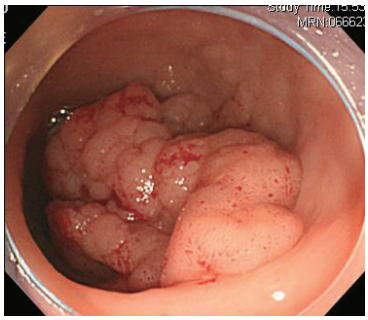
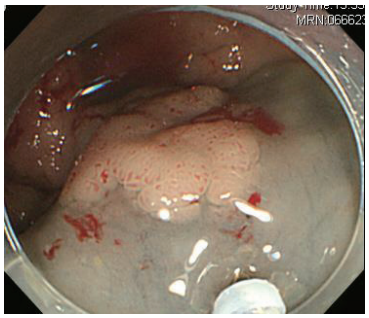
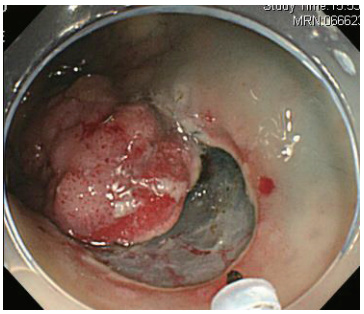
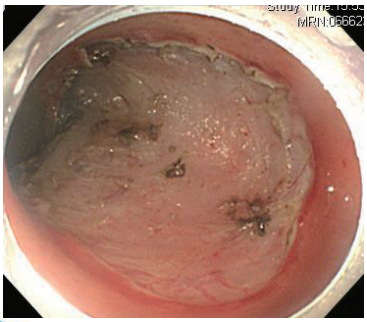
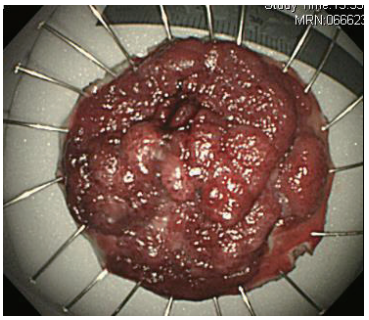
Rectal LST-G-M, 5 cm

Adenocarcinoma,
(well differentiated)
in the pre-existing adenoma

Adenoma size: 5.0 x 4.5 cm
Cancer Size: 0.4 x 0.2 cm

Depth of invasion:
intraepithelial
carcinoma(pTis)

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Three steps to observe polyps *for treatment plan*

Neoplastic vs. Non-neoplastic

Neoplastic : benign vs. malignant

Malignant : mucosal vs. submucosal or deeper

Methods:

Gross endoscopic appearance

Vascular pattern analysis

Pit pattern analysis etc.

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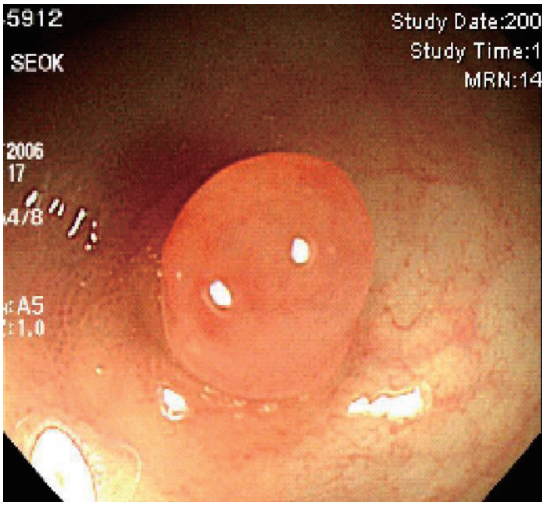
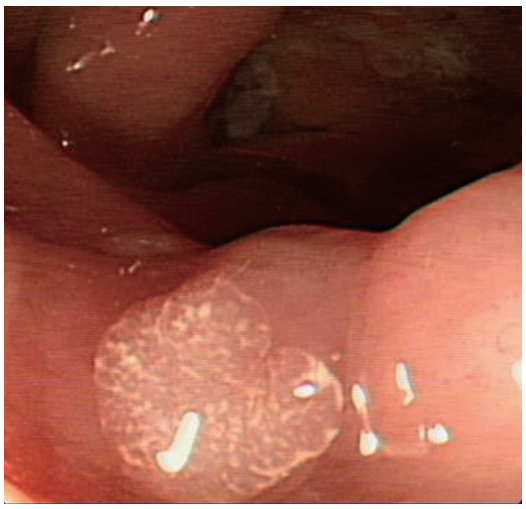
Hyperplastic Polyp





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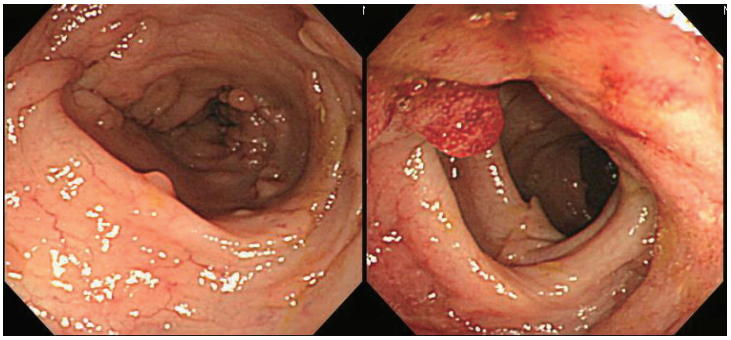
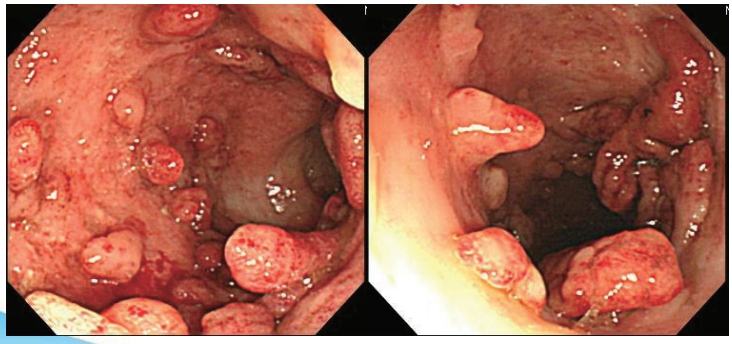
Inflammatory polyp



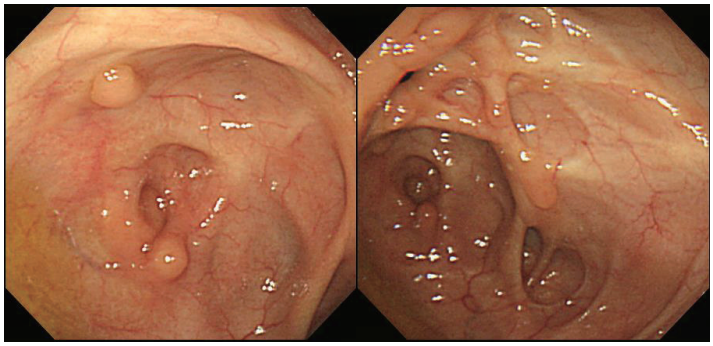
Ascending colon



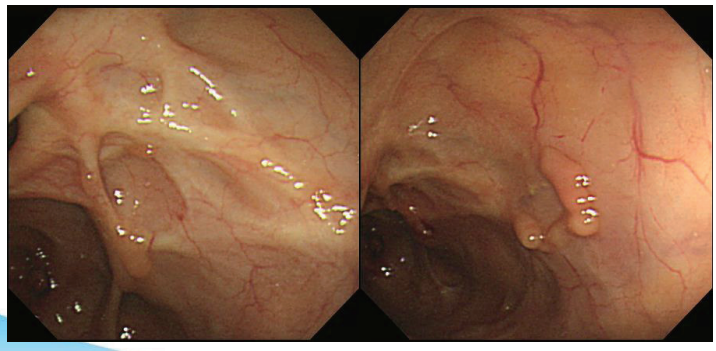
Sigmoid colon

Ulcerative colitis

Inflammatory polyp

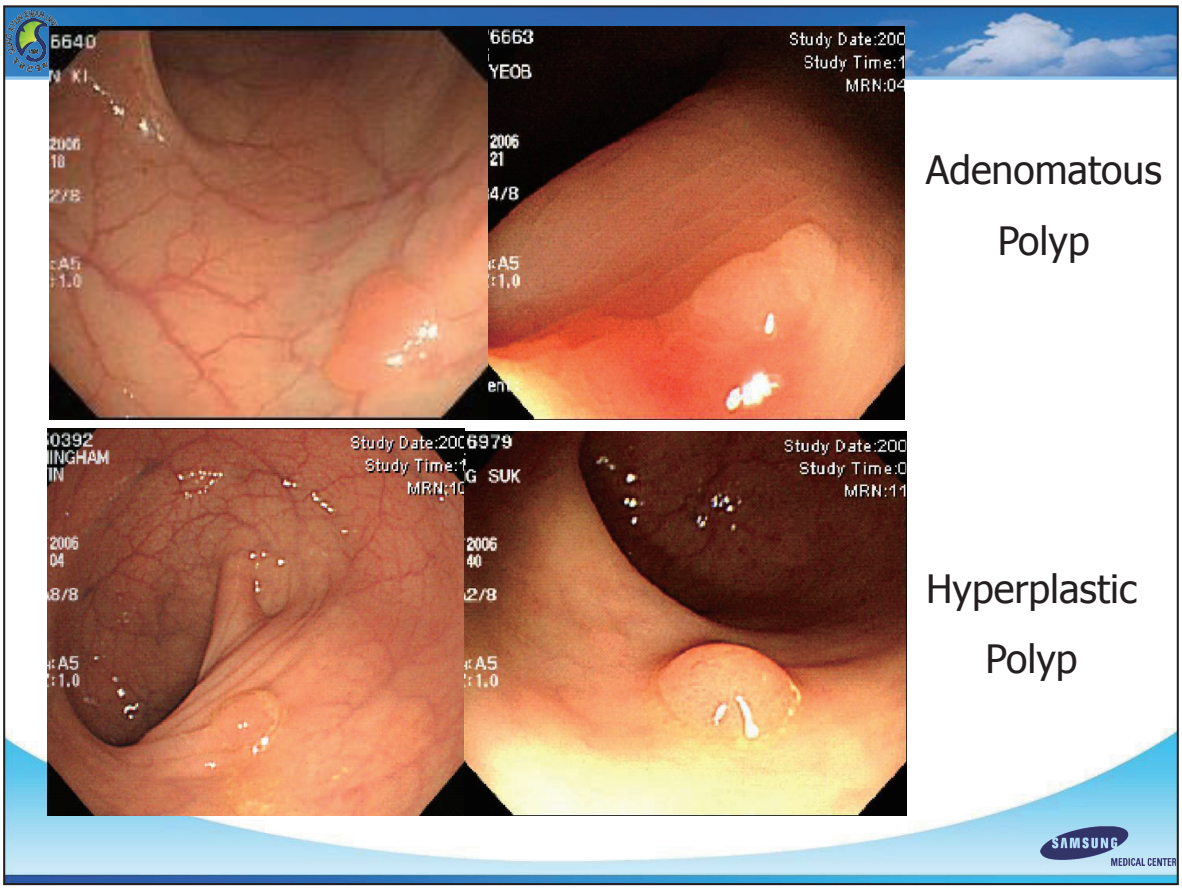


Cecum



Ascending colon

Tuberculosis scar


Adenomatous Polyp
Hyperplastic Polyp
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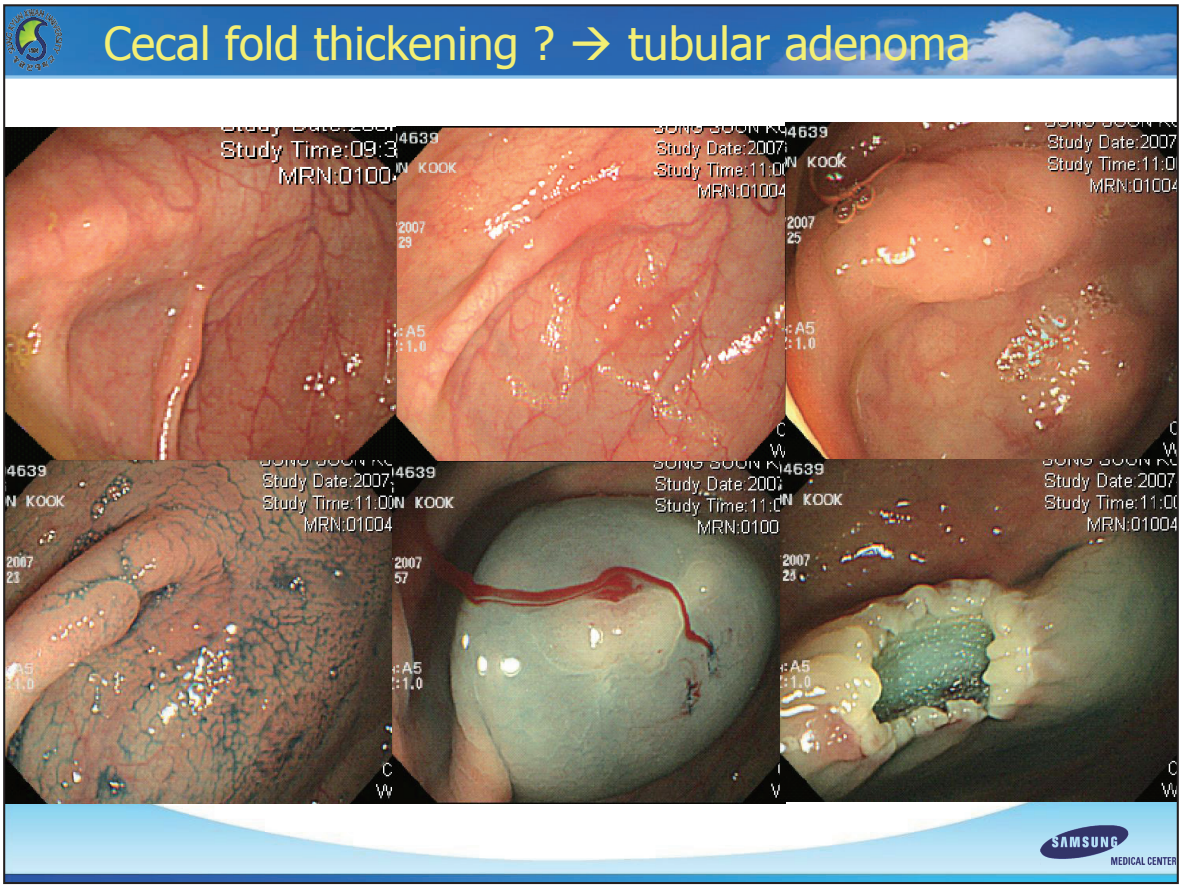
Cecal fold thickening ? → tubular adenoma
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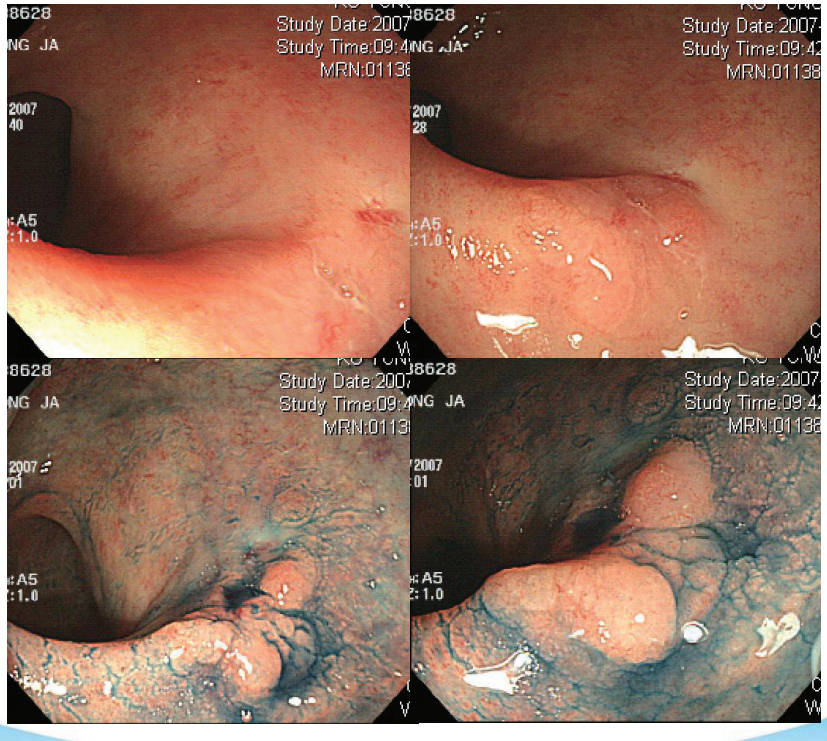
염증? → Tubular adenoma with High grade dysplasia!



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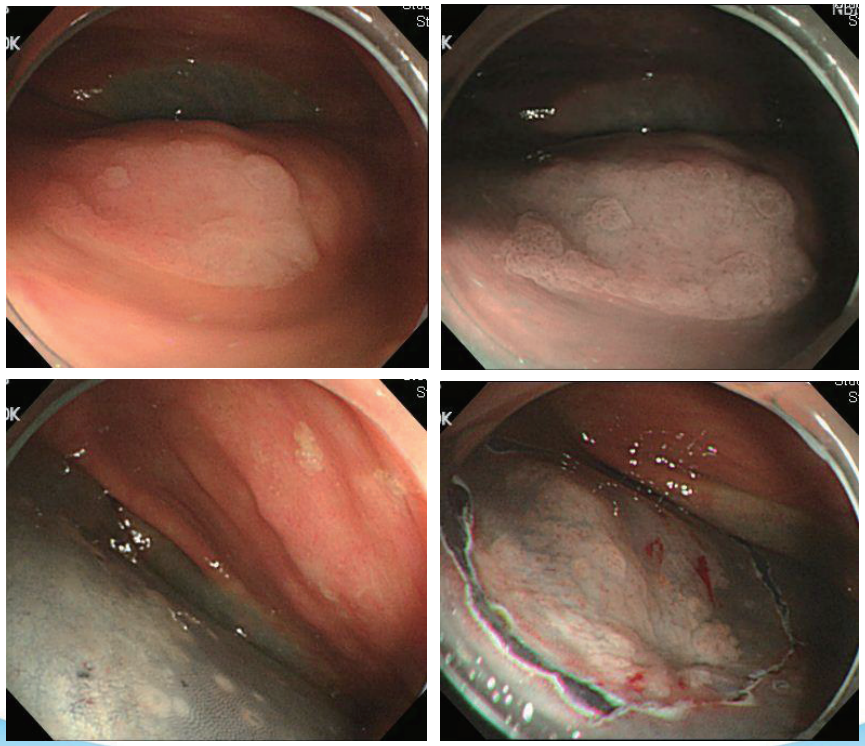
Serrated Adenoma, ascending colon



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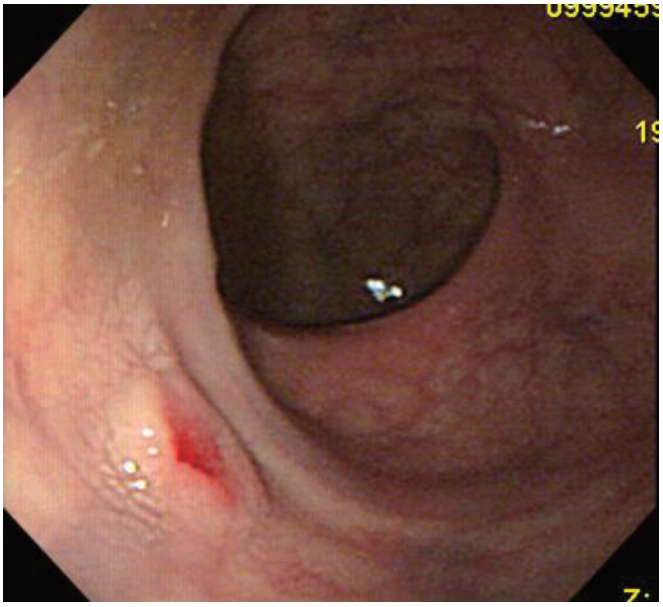
Early colon cancer: IIc+IIa



de-novo cancer ?

Endoscopic Appearance of Depressed type Early Colon Cancers

Color change: hyperemic,

rarely whitish (ddx. with hyperplastic polyp)

Spontaneous bleeding, or bleeding induced by air-inflation

Wall deformity

Irregular-edged depression

Gross Endoscopic Appearances suggestive of Massive Malignant Submucosal Invasion

Size & Gross type: depressed >1 cm,
flat or superficial elevated > 2 cm,
protruded or LST > 3 cm

Hardness, stiffness, or rigidity

Severe depression, erosion, or ulcer

Polyp on polyp (Buddha) appearance

Fold convergence

Loss of air-induced deformity

Pit pattern : type Vn (nonstructural)

Non-lifting sign

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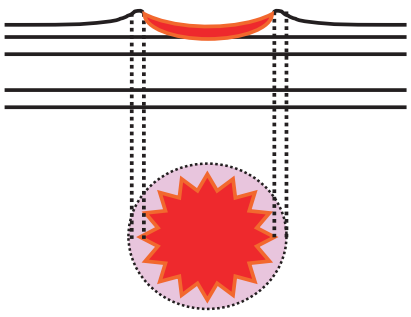
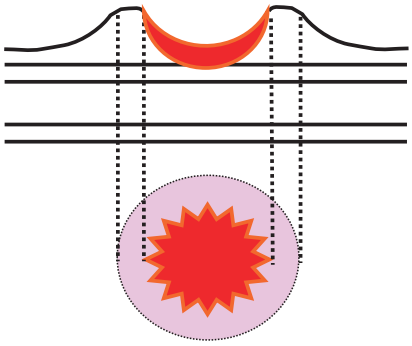
Air-induced deformity in M/SM1 cancer

Increased air volume



Decreased air volume



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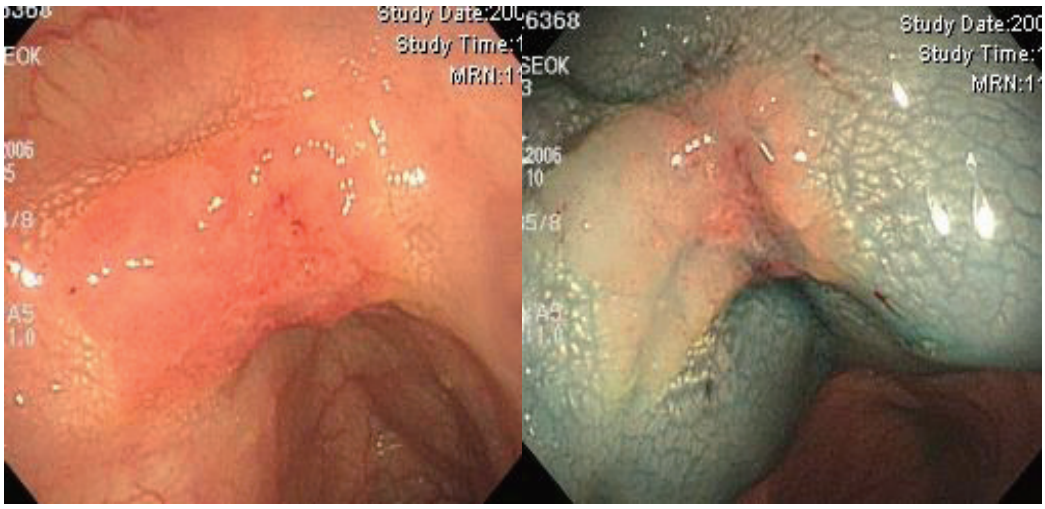
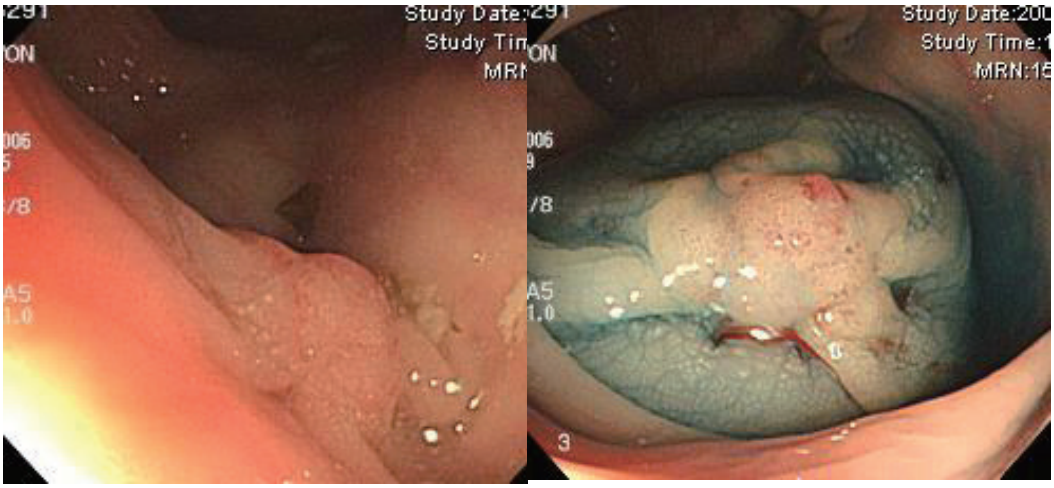
Hardness, non-lifting…



Adenocarcinoma, W/D

- extension to the Muscularis Propria

Fold convergence, Polyp on polyp appearance…



Adenocarcinoma, W/D

- extension to submucosa

Fold convergence, hardness, erosions,

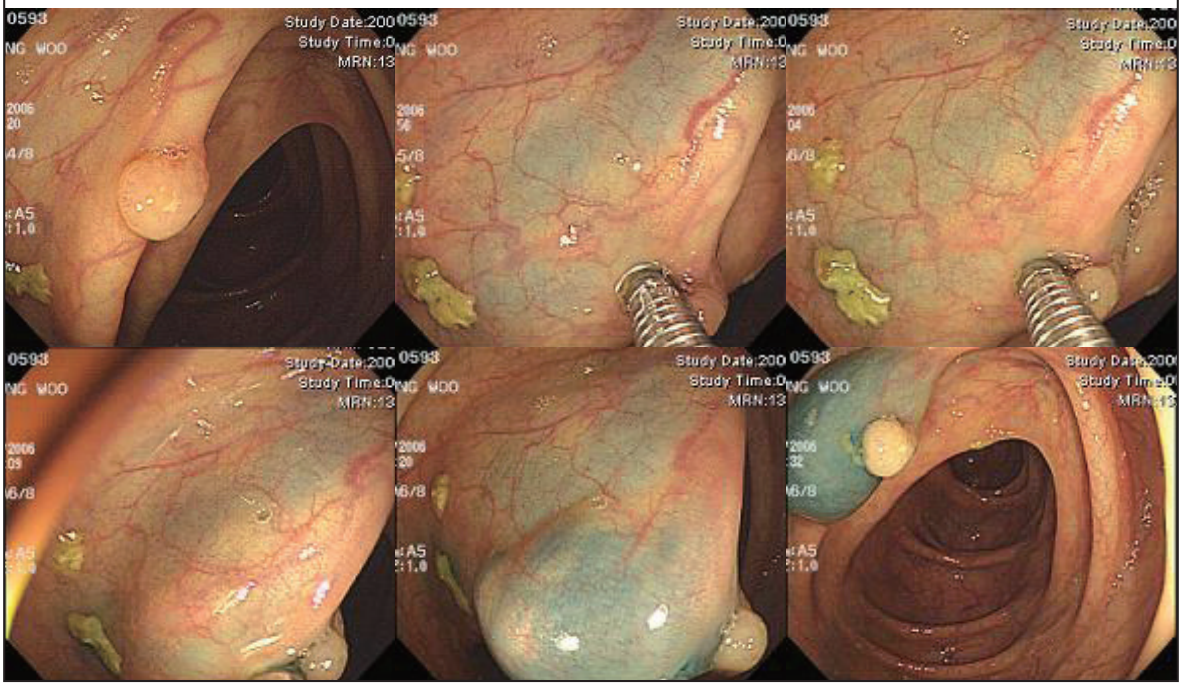
Loss of air-induced deformity, non-lifting…

Adenocarcinoma, W/D

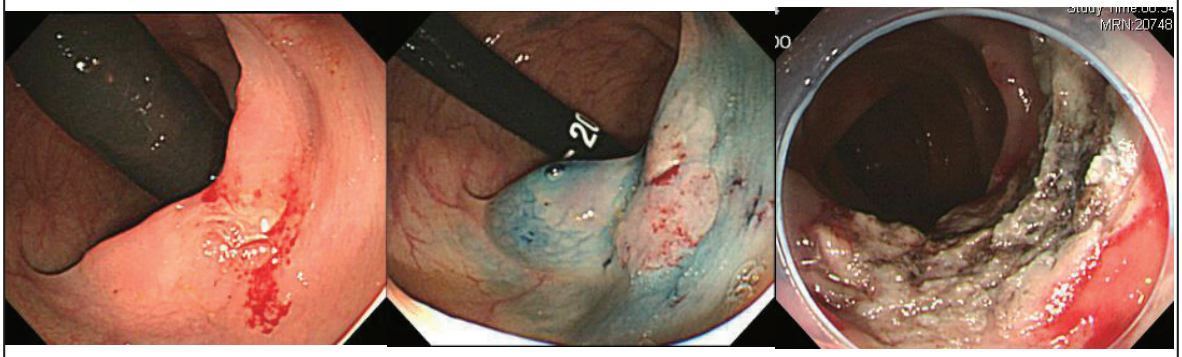
- extension to submucosa

바늘이 고유근층을 뚫으면 융기되지 않는다.

cf) Non-lifting sign (+)인 경우: 주위 점막은 잘 융기.



Do not try submucosal injection if you are not prepared to do complete resection!



D0 → D7

Fibrosis 생겨서 en bloc resection 안 됨.

-> Piecemeal EMR과 coagulation으로 제거

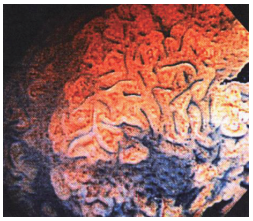
LST는 ESD를 고려하는 경우라면 biopsy도 1 – 2 개만 가볍게!!

Pit Pattern Classification & Treatment

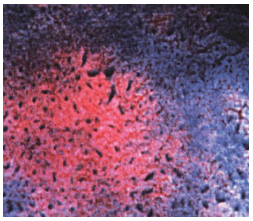
I: normal

II: stellate

→Non-neoplastic
: No treatment



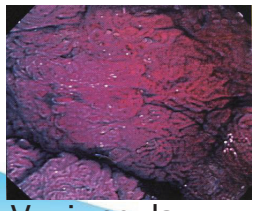
III_L : large tubular



III_S :small round

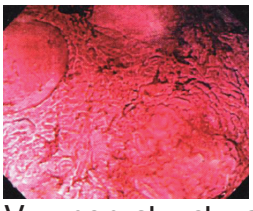
IV: branched, gyriform

→ Adenoma
: Endoscopic resection



V_I : irregular

→ Cancer
: Endoscopic resection (en bloc)

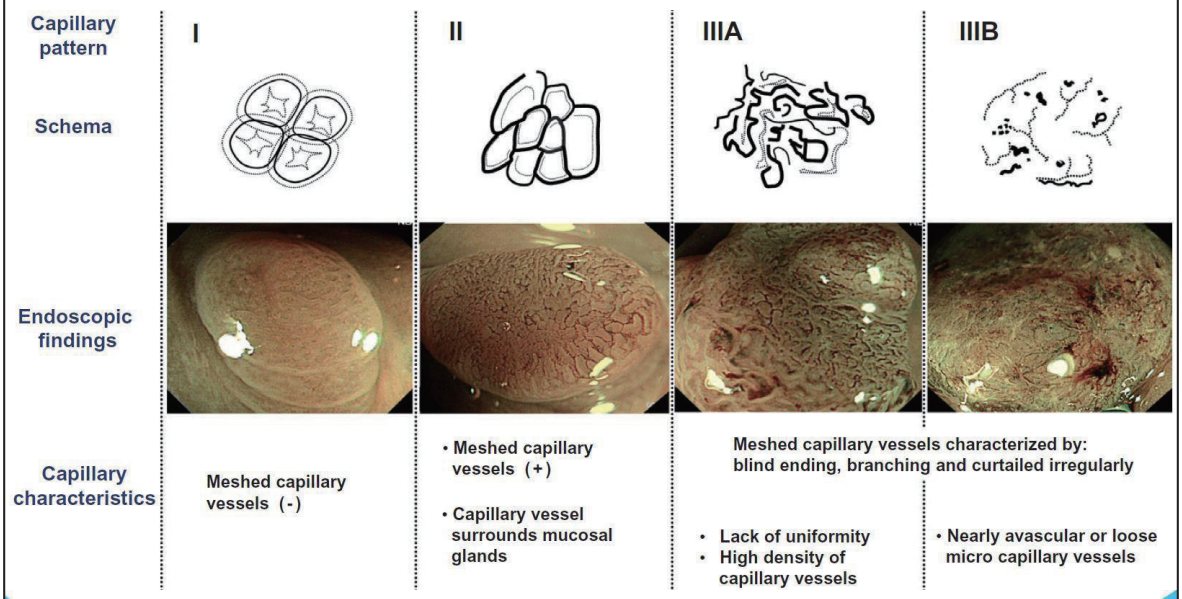


V_N : non-structural

→ SM Cancer
: Surgery

Kudo S et al, Endosccopy 2001;33:367

NBI – Vascular pattern: Sano classification



Tanaka S, Sano Y. Dig Endosc. 2011 May;23 Suppl 1:131-9

NBI international colorectal endoscopic (NICE) classification

	Type 1	Type 2	Type 3
Color	Same or lighter than background	Browner relative to background (verify color arises from vessels)	Brown to dark brown relative to background; sometimes patchy whiter areas
Vessels	None, or isolated lacy vessels might be present coursing across the lesion	Thick brown vessels surrounding white structures‡	Has area(s) with markedly distorted or missing vessels
Surface pattern	Dark or white spots of uniform size, or homogenous absence of pattern	Oval, tubular or branched white structures surrounded by brown vessels	Areas of distortion or absence of pattern
Most likely pathology	Hyperplastic	Adenoma§	Deep submucosal invasive cancer
Sano classification	Type I	Type II–IIIA	Type IIIB
	⇩ No treatment or Endoscopic Resection	⇩ Endoscopic Resection	⇩ Surgery

Tanaka S, Sano Y. Dig Endosc. 2011 May;23 Suppl 1:131-9

Serrated Polyps

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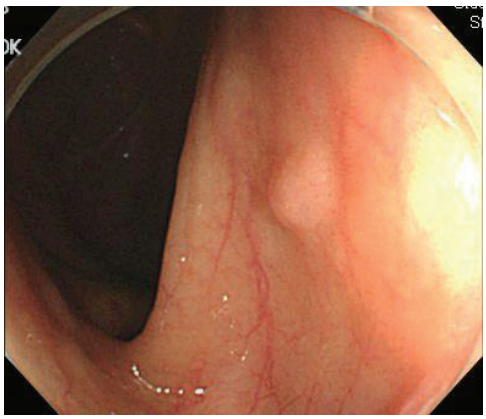
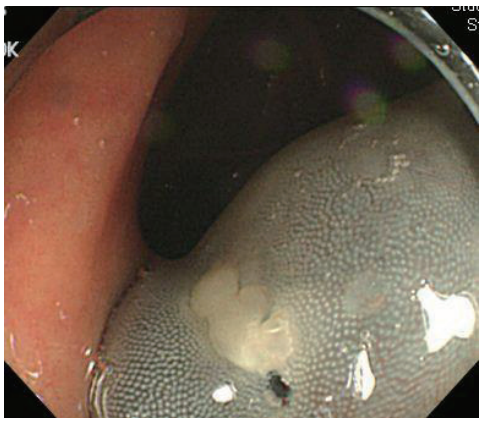
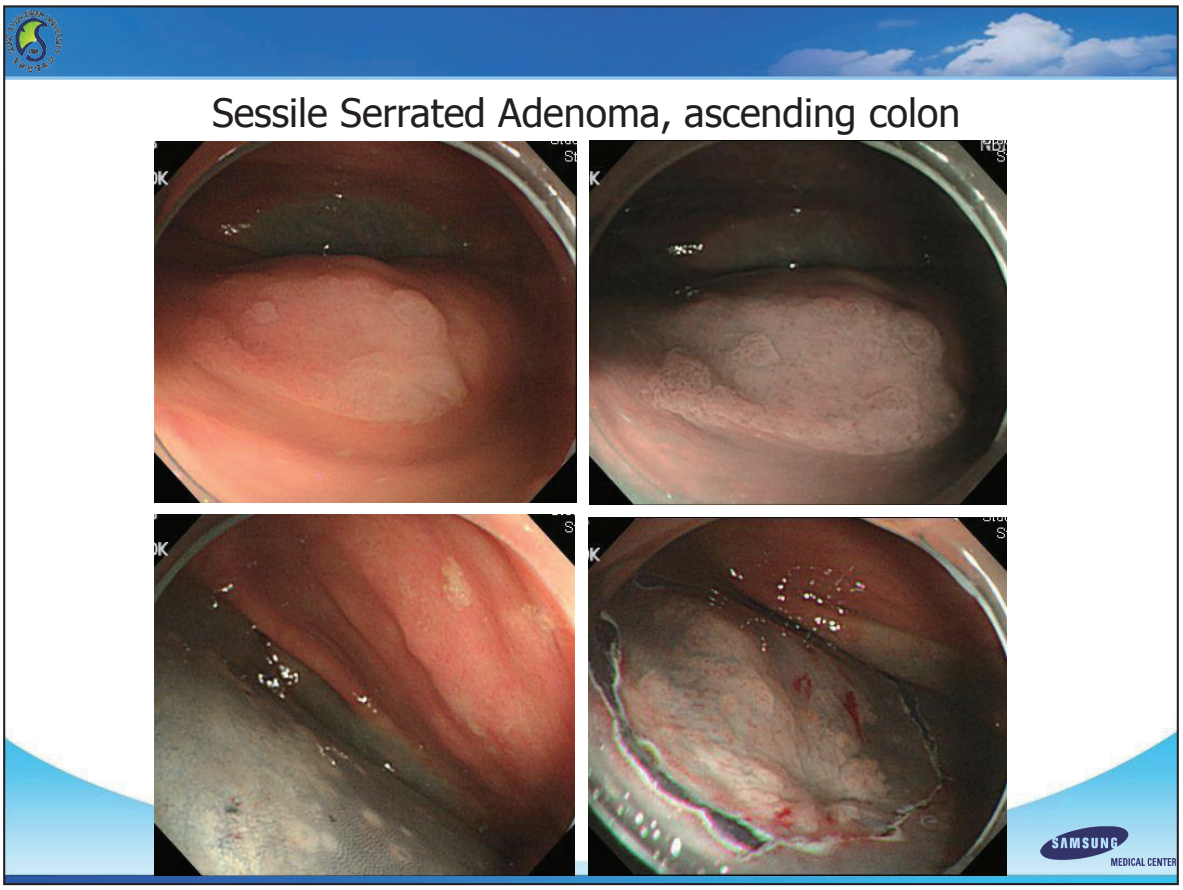
Hyperplastic polyp, ascending colon






Sessile Serrated Adenoma, ascending colon
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Sessile Serrated Adenoma, ascending colon
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PROBLEM POSING

Colonoscopies have resulted in an overall reduction of

-CRC-related deaths by 29%
-Deaths from distal CRC by 47%

-No observed reduction in deaths caused by proximal CRC

* More right-sided CRC cases in the setting of previous negative colonoscopic examinations (interval carcinomas)

Singh H, Nugent Z, Demers AA, et al. The reduction in colorectal cancer mortality after colonoscopy varies by site of the cancer. Gastroenterology 2010;139:1128-37

Frequency and Location of Interval CRCs

Study	Data source	Total detected cancers, n	Interval cancers		
			Overall, n (%)	Proximal, n (%)	Distal, n (%)
Baxter et al 2011	Ontario Ca Registry (2000–2005)	34,312	1260 (9.0)	676 (12.4)	584 (6.8)
Singh et al 2010	Manitoba Ca Registry (1992–2008)	4883	388 (7.9)	225 (11.3)	147 (5.3)
Cooper et al 2012	SEER-Medicare DB (1994–2005)	57,839	4192 (7.2)	2851 (9.9)	1253 (4.5)

Patel SG, Ahnen DJ. Clinical Gastroenterology and Hepatology 2014; 12:7-15

Etiology of Interval Colorectal Cancers

Pabby et al[21] and Robertson et al[37]

•50% - 75% of interval CRCs : missed or incompletely resected lesions

•less than 30% : rapidly progressing lesions.

Missed Lesions

Adenoma detection rates (ADRs) : 17 – 47% (serrated polyps : 1 – 18%)

Tandem colonoscopy (van Rijn et al 2006)/colonoscopy in tandem with CT colonography (Pickhardt et al 2003)

overall adenoma miss rate : 22%,

miss rate for adenomas of 10 mm or greater : 2% - 12%

Incomplete Polypectomy

Overall incomplete resection rate: 10.1% (6.5%–22.7%) (Pohl et al 2013)

- Larger polyps :5.8% (for 5-7mm) vs 23.3% (for 15- 20 mm)
- Sessile serrated polyps (vs adenomas): 31% vs 7.2%

Rapid Progression

Lynch syndrome

MSI, CIMP, and lower rates of *KRAS* mutations→ serrated polyp pathway

Sessile serrated polyps : common in the right colon, missed frequently during endoscopy, and a higher rate of incomplete resection.[47]

Patel SG, Ahnen DJ. Clinical Gastroenterology and Hepatology 2014; 12:7-15

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SERRATED POLYPS

- Serrated = saw-tooth like
- 36% of colonic polyps
- Past: Hyperplastic polyp - the only recognized serrated polyp
- A heterogeneous family of polyps
  - Hyperplastic polyp
  - Sessile Serrated adenoma/polyp
  - Traditional Serrated adenoma

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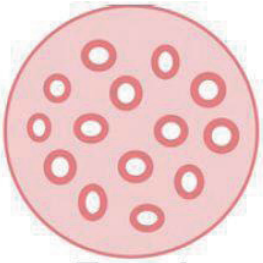
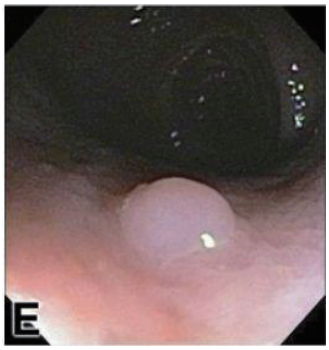
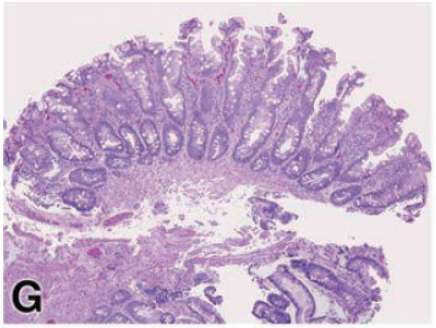
Normal colon

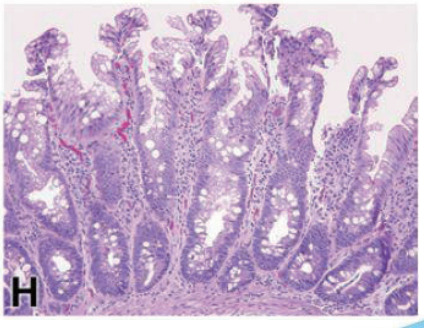


GASTROINTESTINAL ENDOSCOPY 2013:77(3);360 -375

Hyperplastic polyp (Microvesicular type)

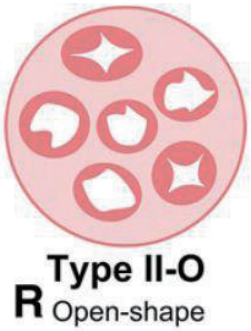


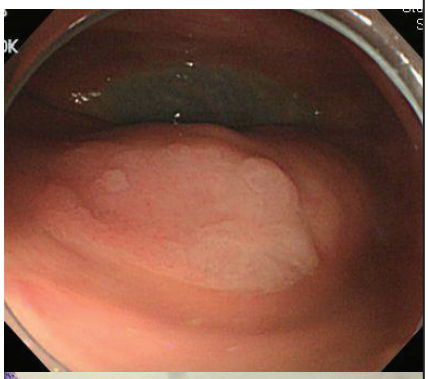


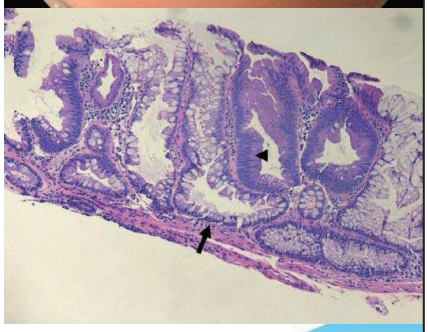


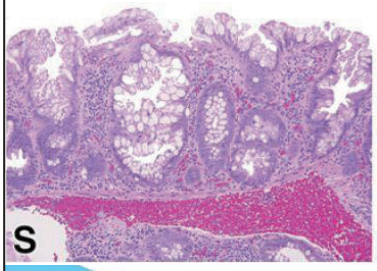
GASTROINTESTINAL ENDOSCOPY 2013:77(3);360 -375

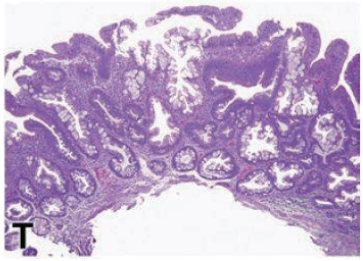
Sessile serrated adenoma/polyp (SSA/P)











GASTROINTESTINAL ENDOSCOPY 2013:77(3);360 -375

Sessile Serrated Adenoma/Polyp (SSA/P)

- Prevalence; 1 ~ 18% (6 ~ 12%) of patients
- Older age, F > M

NEJM 2016: 374(11);1065

SSA/P

Endoscopic features

- predilection for the right colon
- flat or sessile
- usually > 5 mm
- tends to be redder than the other serrated polyps, (less red than the conventional adenomas)
- a yellow-tinged mucus cap, a rim of debris or bubbles, alteration of mucosal fold contour, indistinct borders, and obscuring of submucosal vasculature

→ *"SSA/P is typically flat with indistinct borders, making recognition and complete excision challenging."*

Pit pattern : type II open–shape pit pattern (type II-O)
- represent dilated crypt bases (wider and rounder)

SSA/P

Histological features

- serrations in the whole length of crypts
- boot-, inverted T- shaped, horizontally oriented crypt bases
- tends to lack both a thickened subepithelial collagen table and a prominence of neuroendocrine cells

→ *Recent expert consensus opinions have simplified the diagnostic difficulties:*

First, a single crypt with unequivocal dilation, distortion, and/or horizontally branched crypt is sufficient to establish a dx of SSA/P

Second, clinicians are advised to manage any hyperplastic polyp >10 mm proximal to the sigmoid as an SSA/P.

Nomenclature

Why SSA/P? (SSA = SSP)

The term "adenoma" historically implied low-grade dysplasia

SSA/P without cytologic dysplasia lacks the cytologic features typically seen in low-grade dysplasia in the tubular adenoma

- "sessile serrated polyp" : no or serrated dysplasia
  (not conventional dysplasia)

- "sessile serrated adenoma" : **malignant potential**

Clinical significance of SSA/P

- Precancerous lesion as itself

- A greater polyp burden, and synchronous and metachronous neoplastic lesions

→ *"Identification of SSA/Ps requires increased vigilance for lesions elsewhere in the colon"*

- Common cause of interval cancer

* Interval cancer
- Missed precursor lesions
- Incomplete subtotal polyp resection
- Rapidly growing precursor lesions

→ *Small, flat, indistinct-bordered, and right-sided polyps (such as SSA/Ps) are a high risk of interval cancer*

Traditional serrated adenoma (TSA)

- TSA was introduced in 1990
- < 1% of all colonic polyps

Endoscopically,
- usually left-side predominant,
- pedunculated or sub-pedunculated
- usually > 5 mm
- granulonodular and lobular appearance (like conventional adenoma)

Pit pattern:
often combined pit patterns: type II and/or IIIS/IIIL
(not common in the conventional adenoma)

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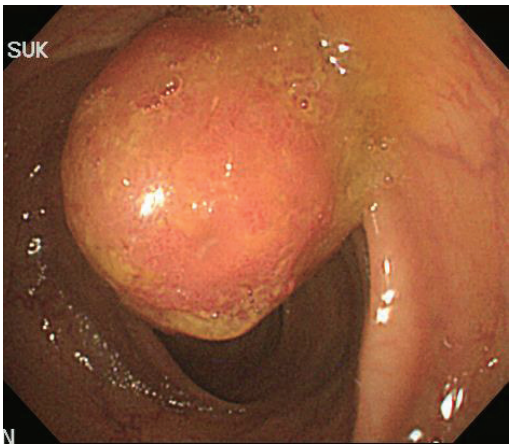
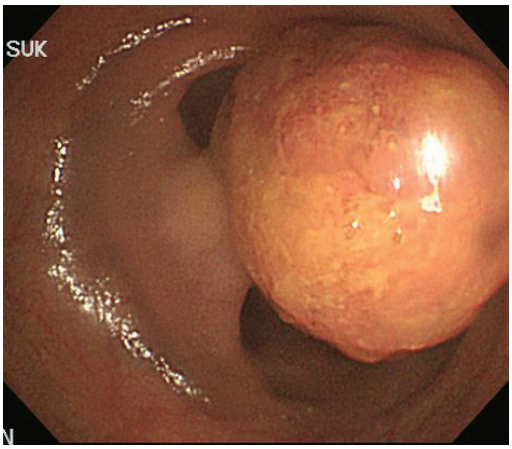
Traditional serrated adenoma, Descending colon





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MOLECULAR ASPECTS OF THE SERRATED NEOPLASTIC PATHWAY

Molecular genetics of CRC - 3 most established pathways

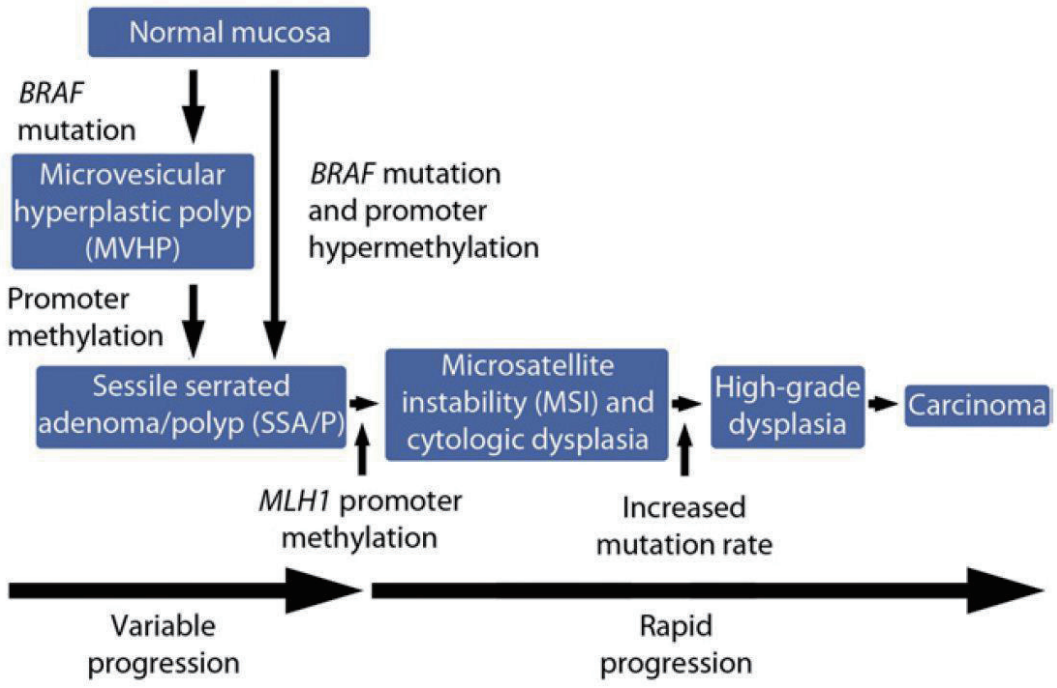
(1) Chromosome instability pathway: APC, K-RAS-P53

(2) DNA mismatch repair pathway:

MMR(MSH2, MLH1, MSH6, PMS2) → MSI

(3) CpG island hypermethylation (CIMP) pathway → the central defect of the serrated pathway of neoplasia.

Sessile serrated neoplastic pathway



GASTROINTESTINAL ENDOSCOPY 2013:77(3);360 -375

Serrated polyposis (formerly, hyperplastic polyposis)

WHO criteria for serrated polyposis

- At least 5 serrated polyps proximal to the sigmoid colon, at least 2 polyps 10 mm, or

- Any number of serrated polyps proximal to the sigmoid colon in an individual who has a first-degree relative with serrated polyposis, or

- 20 serrated polyps of any size distributed throughout the colon

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Serrated polyposis

- 1.8 – 4 % of colonoscopy patients

- Median ages: 50 – 62 years

- Up to nearly 40% risk of CRC

A study of 4,462 polyps from 100 pts with serrated polyposis
- 83% were serrated polyps
  (156 MVHPs, 25 GCHPs, 138 SSAs, 18 TSAs)
- 17% were conventional adenomas
  (55 tubular adenomas, 14 tubulovillous adenomas).

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CLINICAL MANAGEMENT RECOMMENDATIONS

Given the malignant potential of the SSA/P, TSA, and filiform SA, **complete endoscopic resection is critical.**

- All proximal serrated polyps (proximal to the sigmoid colon) should be removed

- All proximal serrated polyps > 10 mm diagnosed as hyperplastic polyps should be clinically managed as SSA/Ps

When SSA/P margins cannot be fully resected, residual tissue can be removed by cold forceps or burned by APC, and close endoscopic follow-up is advised

- 1 year per the U.S. Multi-Society Task Force guidelines
- 3 ~ 6 months per expert consensus opinions

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Management of Serrated Polyposis

All proximal colon polyps or all serrated polyps > 5 mm should be completely removed, if numerous diminutive polyps are observed.

Colon resection can be advised for colorectal cancer or when endoscopic control of polyps is no longer feasible.

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대장 용종
조직 검사 vs. 용종 제거술

Natural History of Untreated Polyp

- A study using serial sigmoidoscopy for tattooed colorectal polyps < 1 cm (not all of which would have been adenomas) over the course of 3 to 5 years
  - 4% increased in size
  - 70% remained unchanged
  - 8% were smaller
  - 18% disappeared
- A diminutive adenoma(<0.5 cm) requires 2 to 3 years to reach 1 cm size

Kozuka S. Dis Colon Rectum 1975

* Prevalence of adenoma (autopsy study)
- 1.72% in the third decade
- 3.59% in the fifth decade
- Sharply increase to 20 ~ 53 % in ≥ 50 years old, US

NEJM 2016: 374(11);1065

Cumulative risk for cancer in 1cm adenoma

- 2.5% at 5 yrs,
- 8% at 10 yrs,
- 25% at 20 yrs

Carroll RLA Prev Med 1980

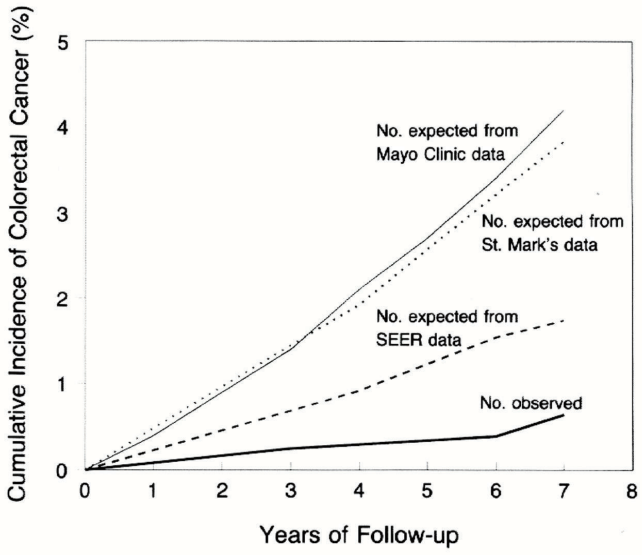
Percentage of containing cancer in adenoma

	Surgical polypectomies	Colonoscopic polypectomies
Adenoma Size		
<1cm	**1.3%**	**0.5%**
1-2cm	9.5%	4.6%
>2cm	46.0%	10.8%
Histologic Type		
tubular	4.8%	2.8%
villotubular	22.5%	8.4%
villous	40.7%	9.5%
Degree of dysplasia		
mild	5.7%	2.8%
moderate	18.0%	8.4%
severe	34.5%	9.5%

Muto T. Cancer 1975

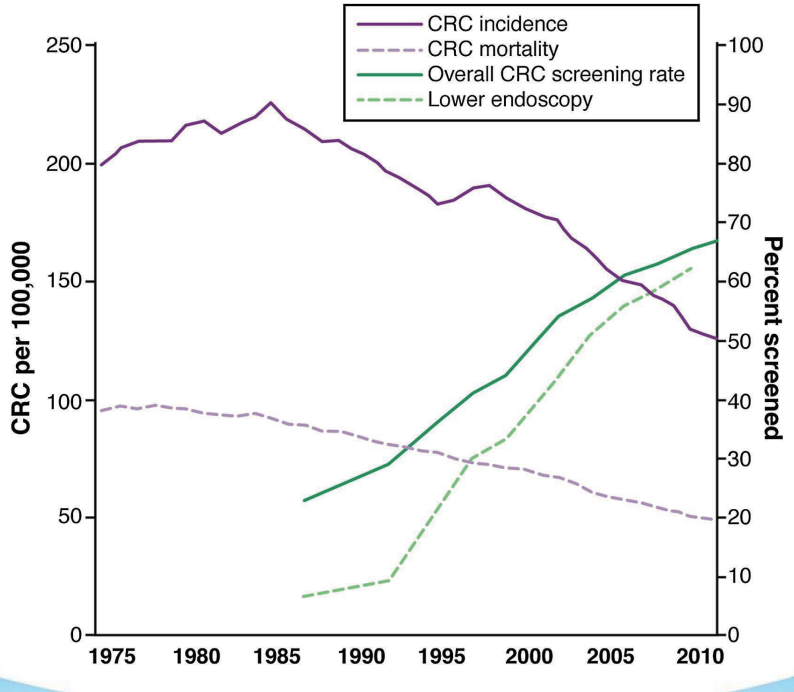
Cumulative Incidence of Colorectal Cancer in the National Polyp Study Cohort

- 76 ~ 90 % reduction in cancer incidence -



Winawer, S. J. et al. N Engl J Med 1993;329:1977-1981

Incidence/mortality of CRC and screening uptake rates over time (US)



Source: Clinical Gastroenterology and Hepatology 2014; 12:7-15 (DOI:10.1016/j.cgh.2013.04.027) Copyright © 2014 AGA Institute

용종의 최종 진단은 조직학적 검사 필요.

- 겸자 생검 후, 종양성 용종만 제거할 것인가?
  : Two-stage polypectomy
- 발견 즉시 제거할 것인가?
  : One-stage polypectomy

One-stage polypectomy의 장점

- Two-stage polypectomy에서 조직 결과 불일치율: 15 – 30 %
- 대장 용종의 60 – 70 %가 선종: 결국 다수에서 용종제거 필요
- 미소대장암에서 겸자 생검이 조직 구조를 파괴하여 다음의 EMR을 곤란하게 할 수 있다.
- Second-stage 에서 용종을 찾지 못하는 경우가 적지 않다.
  :생검 결과가 암인데, 찾을 수 없다면 심각한 낭패
- One-stage polypectomy: 환자의 불편, 시간-경제적 손실 감소

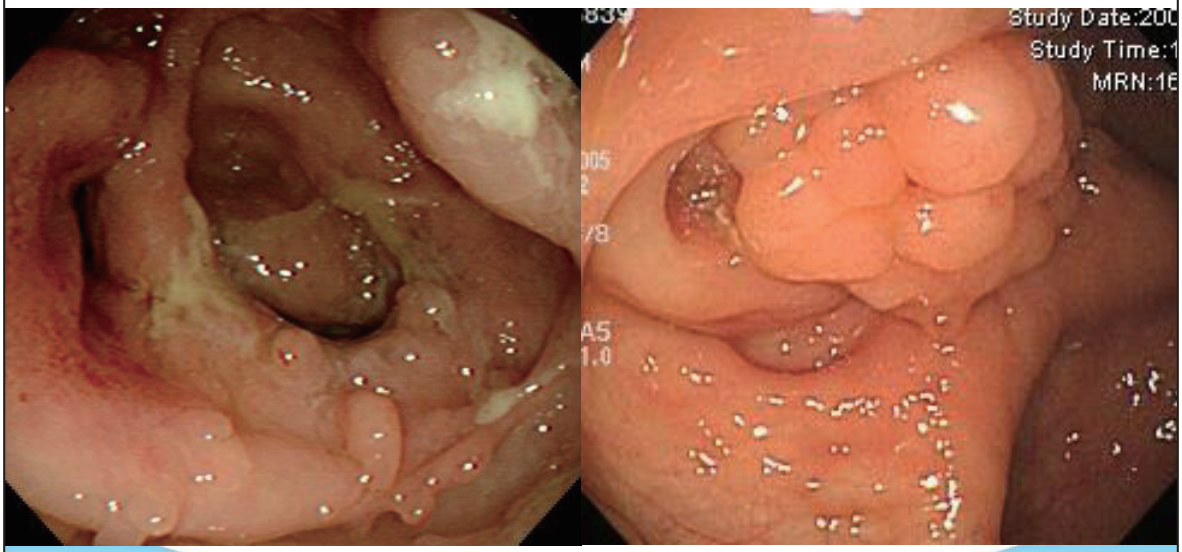
Rex RK. et al. Quality indicators for colonoscopy.
Gastrointestinal endoscopy 63:4;S16 -S28: 2006

- Consistent referral of small "routine" colorectal polyps identified during diagnostic colonoscopy for repeat colonoscopy and polypectomy by others is unacceptable.
- Referral of technically difficult polyps to more experienced endoscopists for endoscopic resection is encouraged.

그렇다면,
용종을 모두 one-stage로 제거할 것인가?

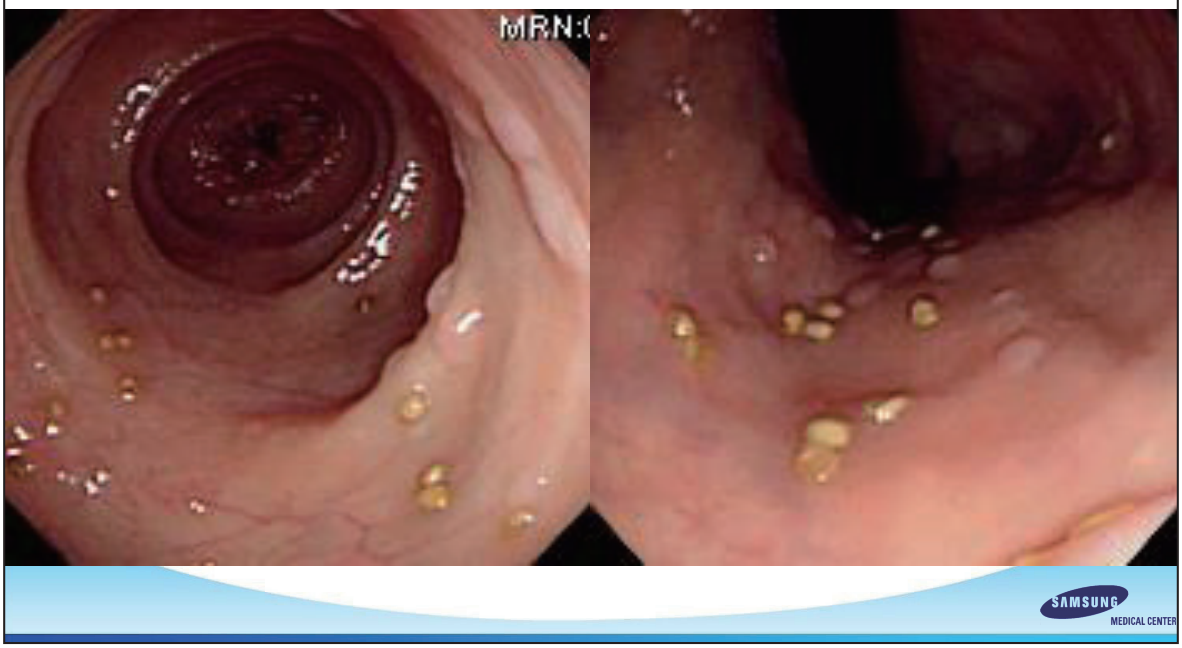
불필요한 용종 제거는 하지 말자

명백한 Inflammatory Polyps



불필요한 용종 제거는 하지 말자

Rectosigmoid area의 명백한 multiple hyperplastic Polyps



자신이 없으면 제거하지 말자→ Biopsy only!

기술적 한계 : Endoscopist-dependent

- 절제가 어려운 위치에 있는 용종
  :간만곡부 원위부 내측, 비만곡부 원위부 하방, 경사진 위치 등.
  -> 시야 확보 곤란, 올가미 접근 곤란
- 너무 큰 용종
- 편평형 또는 함몰형으로 완전 절제가 어려운 용종

: Two-stage polypectomy or Surgery

내시경으로 제거해서는 안 되는 용종도 있다.

:내시경으로 완치 불가능한 악성 용종

- 림프절 전이
- 원격 전이

→ Biopsy only!

점막하층 암세포 대량 침윤-> 림프절 전이율 10 %

"점막하 대량 침윤이 강력히 의심되면, 내시경 절제하지 말자"

Diminutive polyp (<5 mm)의 절제는 필요한가, 불필요한가?

Risk vs. Benefit

Clinical Significance of Small Colorectal Polyps

Size (mm)	n	Neoplastic (%)	TA	TVA	VA	High grade dysplasia	Cancer (% Neoplastic)	High Risk
<6	4,381	2,066 (49)	2,002	51	2	39	2 (0.1)	**4.4%**
6 - 10	666	418 (67)	359	50	4	15	1 (0.2)	15.6%
>10	675	496 (77)	235	211	26	89	21(4.2)	100%
Total	5,722	2,980 (54)	2,596	312	32	143	24 (0.8)	

Advanced adenomas (NEJM 2016: 374(11);1065)

those containing ≥25 percent villous architecture,

those with high grade dysplasia,

and those ≥ 10 mm in size.

적어도 선종은 크기와 상관없이 제거 권장. Church JM 2004. Dis Colon Rectum 47:481

F/U study by CT colonography: 99% of diminutive and small lesions: benign→ for the diminutive polyps, consider resect-and-discard or diagnose-and-leave strategy after high-resolution photography. NEJM 2016: 374(11);1065

Summary: Tips for polyp treatment

- Endoscopic differential diagnosis for polyps has limitations
- Tissue diagnosis is mandatory for confirmation
- Symptomatic polyps should be removed.
- Neoplastic polyps should be removed.
- Asymptomatic, definite non-neoplastic polyps can be followed-up.
- Removal of diminutive polyps: controversial ->cold biopsy or snaring
- If prepared, one-stage polypectomy is desirable.
- Malignant polyps that are highly suggestive of massive submucosal invasion should be surgically removed. (Non-lifting sign)
- Safe endoscopy skill provides wide range of management options.

(One-stage polypectomy, two-stage polypectomy, or surgery)

Independent risk factors for failed endotherapy

Feature	Statistica' association (n=479)
Previous intervention	OR: 3.75, 95% CI 1.77 to 7.94; p=0.001
Ileocaecal valve involvement	OR=3.38; 95% CI 1.20 to 9.52; p=0.021
Difficult position	OR=2.17; 95% CI 1.14 to 4.12; p=0.019
Lesion size >40 mm	OR=4.37; 95% CI 2.43 to 7.88; p<0.001
Previous APC use	OR=3.51; 95% CI 1.69 to 7.27; p=0.001

APC, argon plasma coagulation.

Rutter MD et al. **British Society of Gastroenterology/Association** of Coloproctologists of Great Britain and Ireland **guidelines** for the management of **large non-pedunculated colorectal polyps**. Gut. 2015; 64(12): 1847–1873.
Moss A, Bourke MJ, Williams SJ, et al. Endoscopic mucosal resection outcomes and prediction of submucosal cancer from advanced colonic mucosal neoplasia. Gastroenterology 2011;140:1909–18.

Non-pedunculated colorectal polyps

(a) Increased risk of malignancy

- Pit pattern type V
- Paris 0-IIc or 0-IIa+IIc morphology
- Non-granular laterally spreading type polyp (LST-NG)
- Granular LST (LST-G) with a dominant nodule
- Distorted surface pattern, colour and vessels (NICE NBI type III)
- Thick and irregular microvessels (Sano capillary pattern type III)

(b) Increased risk of incomplete excision/recurrence

- Size ≥40mm
- Location involving ileocaecal valve, appendix, diverticulum or dentate line
- Within an inflamed segment of colitis
- Prior failed attempt at resection or recurrence at site of previous resection (excluding unifocal, diminutive and easily resected/ablated residual adenoma on first site check)
- Non-lifting sign after submucosal injection
- Endoscopist concern about difficult location (e.g. behind flexure or fold, in stenotic diverticular disease)

(c) Increased risk of adverse events

- Caecal location
- Size ≥40mm
- Endoscopist inexperience

Rutter MD et al. **British Society of Gastroenterology/Association** of Coloproctologists of Great Britain and Ireland **guidelines** for the management of **large non–pedunculated colorectal polyps**. Gut. 2015; 64(12): 1847–1873.

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Major histopathological considerations in the management of large non-pedunculated colorectal polyps (LNPCPs).

- Judicious use of targeted biopsies: Recommended only when there is suspicion of malignancy in a LNPCP, to help ensure endotherapy is not compromised.
- Awareness of significant potential for under calling of malignancy in the endoscopic biopsy setting.
- In polypectomy evaluation, confirmation of the adenomatous nature of the polyp and confirmation of benignity i.e. exclusion of adenocarcinoma arising within the adenoma
- Emphasising the distinction between invasive neoplasia and so-called 'epithelial misplacement'.
- Assessment of adenoma subtype according to WHO 2010 classification as tubular, tubulovillous, villous or traditional serrated.
- Assessment of grade of dysplasia/neoplasia using a two tier system.
- Assessment of margin involvement by dysplasia, where possible, in accordance with the nature of the specimen received (en-bloc or piecemeal) and endoscopic correlation regarding completeness of excision

Rutter MD et al. **British Society of Gastroenterology/Association** of Coloproctologists of Great Britain and Ireland **guidelines** for the management of **large non–pedunculated colorectal polyps**. Gut. 2015; 64(12): 1847–1873.

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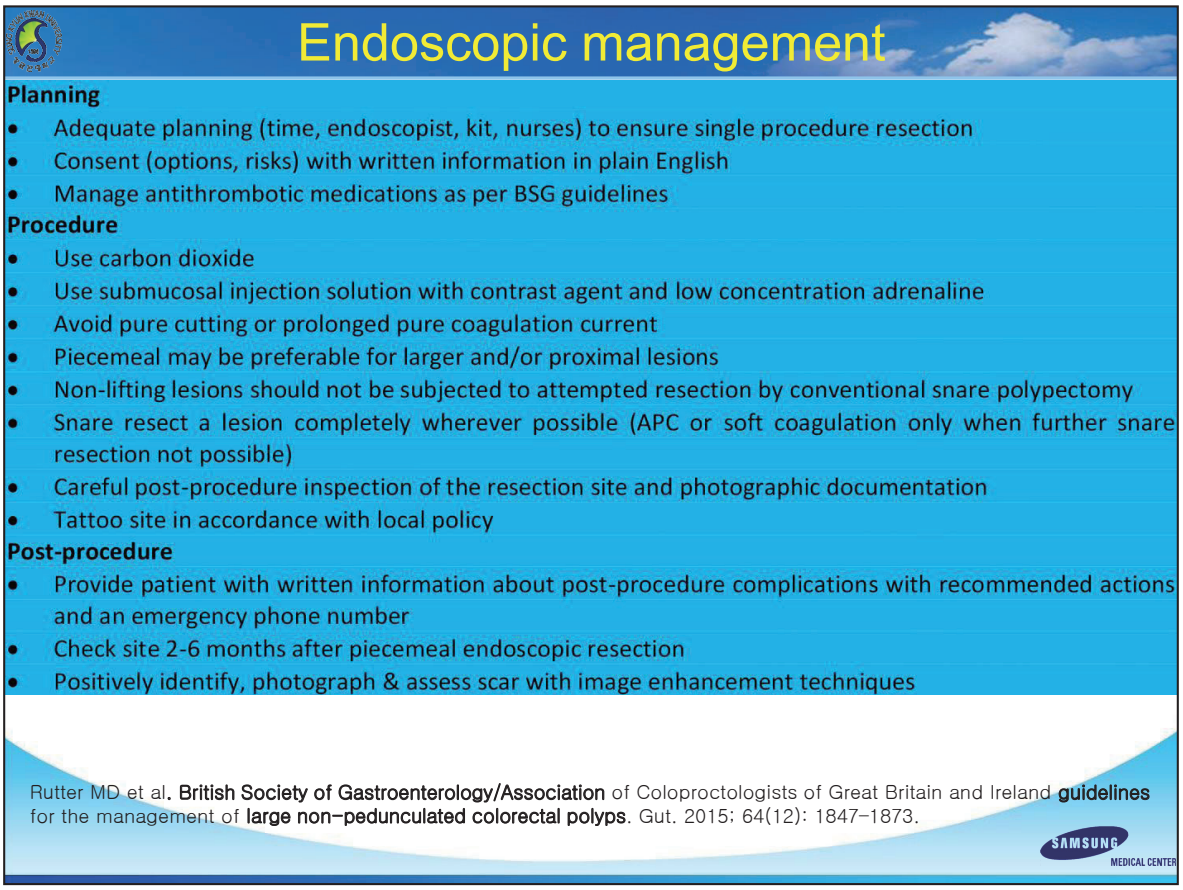
Endoscopic management
Planning
• Adequate planning (time, endoscopist, kit, nurses) to ensure single procedure resection
• Consent (options, risks) with written information in plain English
• Manage antithrombotic medications as per BSG guidelines
Procedure
• Use carbon dioxide
• Use submucosal injection solution with contrast agent and low concentration adrenaline
• Avoid pure cutting or prolonged pure coagulation current
• Piecemeal may be preferable for larger and/or proximal lesions
• Non-lifting lesions should not be subjected to attempted resection by conventional snare polypectomy
• Snare resect a lesion completely wherever possible (APC or soft coagulation only when further snare resection not possible)
• Careful post-procedure inspection of the resection site and photographic documentation
• Tattoo site in accordance with local policy
Post-procedure
• Provide patient with written information about post-procedure complications with recommended actions and an emergency phone number
• Check site 2-6 months after piecemeal endoscopic resection
• Positively identify, photograph & assess scar with image enhancement techniques
Rutter MD et al. British Society of Gastroenterology/Association of Coloproctologists of Great Britain and Ireland guidelines for the management of large non–pedunculated colorectal polyps. Gut. 2015; 64(12): 1847–1873.
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