

대장내시경

- Comments from ex-expert

성균관대학교 의과대학 삼성서울병원 소화기내과

REVIEW ARTICLE

Colonoscopy: Art or science?

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Key words

Colonoscopy, endoscopic techniques, cecal intubation, difficult procedures.

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Abstract

The focus on colorectal neoplasia has led to an exponential increase in the use of colonoscopy in many countries. Although colonoscopy facilitates the diagnosis and treatment of colonic disease, there are public health issues that include access, training, diagnostic accuracy, complications and additions to health-care costs. Because of this, colonoscopists have a responsibility to ensure that the procedure is appropriate, safe and of high-quality. This article addresses the issue of variation in technical skills that is known to exist within the endoscopic community, even among individuals with similar experience. While some of this variation reflects innate manual dexterity, another aspect is variation in the adoption of technical manoeuvres that facilitate various aspects of the procedure including rates for cecal intubation. Although technical manoeuvres are difficult to evaluate in controlled trials, there is persuasive data that high cecal intubation rates can be achieved by minimizing inflation and looping in the sigmoid colon and by the appropriate use of positional changes and abdominal pressure. In difficult settings, there is also benefit from the use of non-standard endoscopes and various accessories including overtubes.

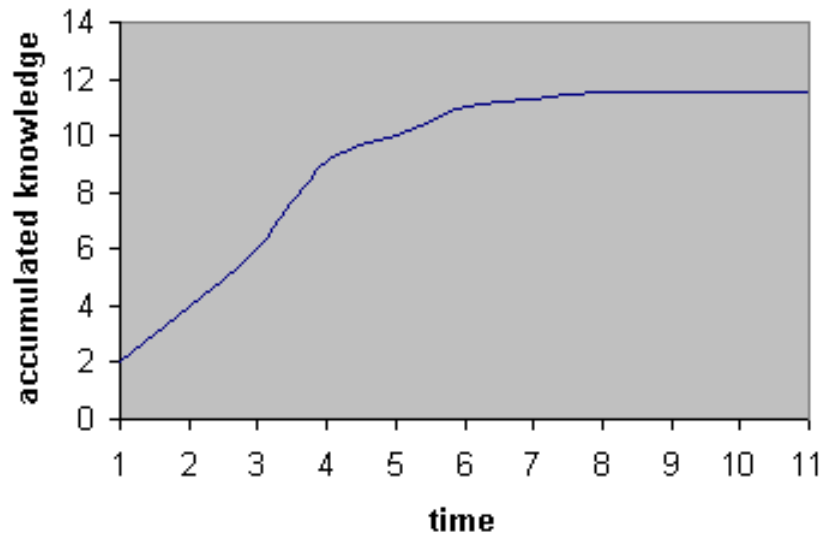
Fellow 생활 마지막 발표에서..

내시경을 하면서...

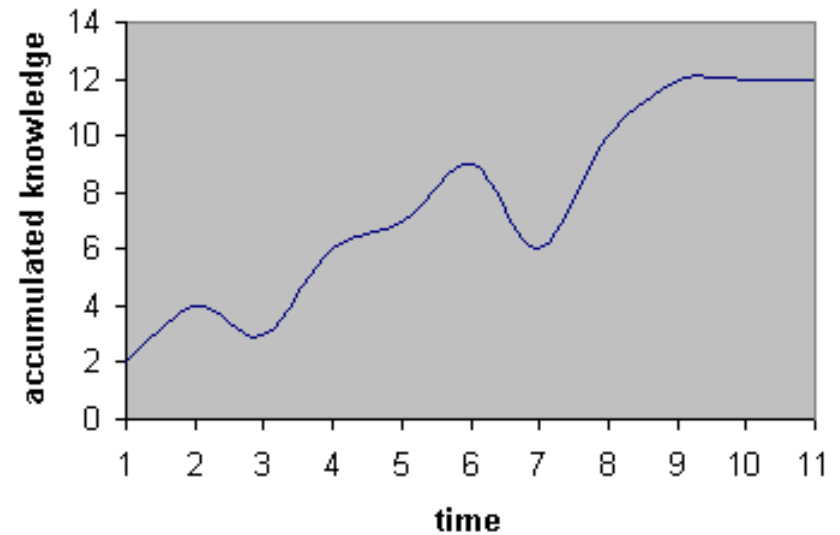
1. 위내시경 목넘기기
2. 어디가 정상이고 어디가 비정상인가...?
3. 대장내시경 삽입
4. 대장내시경 삽입시간 단축
5. 대장용종 절제술
6. 위내시경 병변과 조직검사

Two Types of Learning Curve

Monotonic Learning



Non-Monotonic Learning



대장내시경과 나 (1)

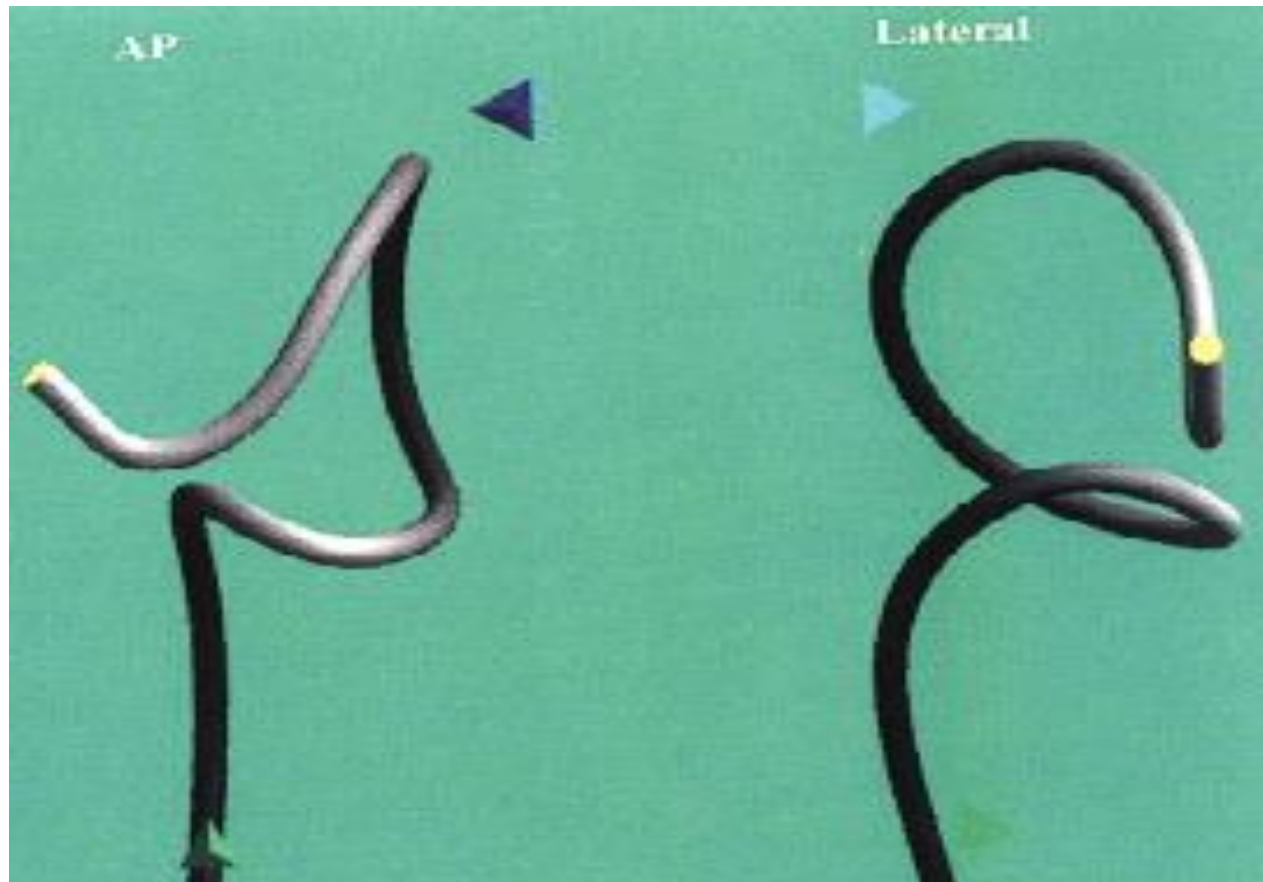
- 전공의 4년차 시절
- 군의관 시절 - 대항병원 신건성 선생님
- Fellow 시절
- 강북삼성병원 의사 시절
- 삼성서울병원 junior
- 삼성서울병원 middle man
- 삼성서울병원 senior

대장내시경 초기 경험

성균관대학교 의과대학 삼성서울병원 소화기내과

전공의 4년차 시절

Magnetic Endoscope Imaging



Various loops during colonoscopy

alpha loop



N loop



reverse alpha loop



sigmoid loop



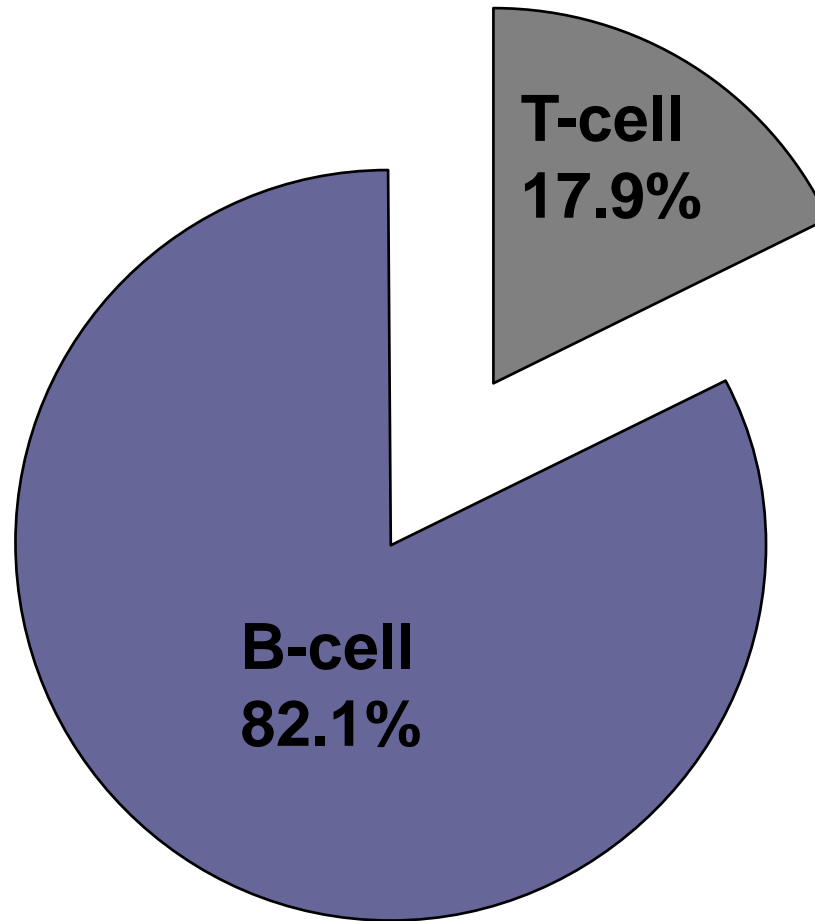
Fellow 시절



Primary Colon Lymphoma in Korea: A KASID (Korean Association for the Study of Intestinal Diseases) Study

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H. S. KIM, MD,‡ S. J. MYUNG, MD,† W. H. KIM, MD,‡ J. C. RHEE, MD,* K. Y. CHOI, MD,|| I. S. SONG, MD,§
J. H. HYUN, MD,§§ and Y. I. MIN, MD†

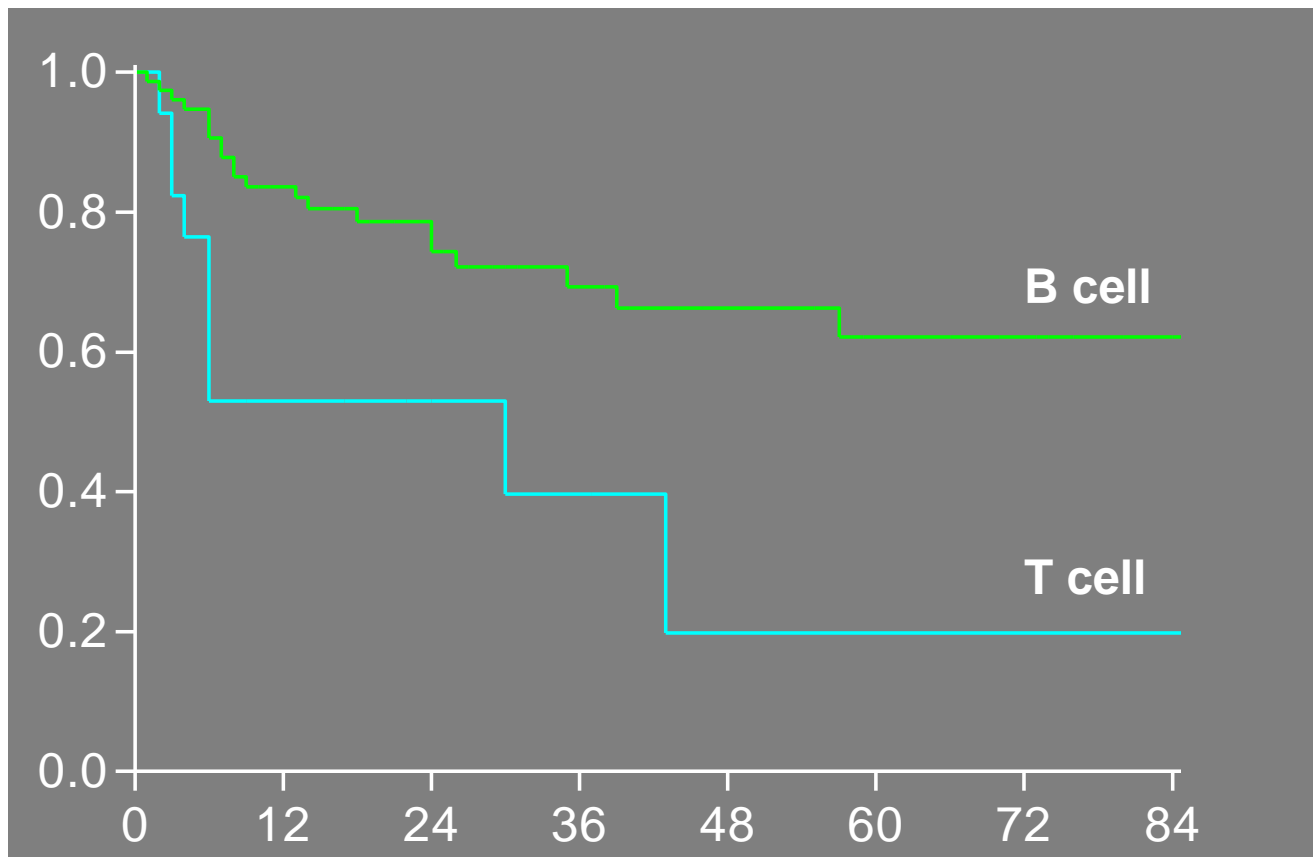
Although almost all primary colorectal lymphomas are of B-cell lineage in Western countries, primary colorectal T-cell lymphomas are not uncommon in the East. The aim of this study was to review the clinical characteristics and treatment outcomes of primary colorectal lymphomas, with special emphasis on the differences between T-cell and B-cell lymphomas. Ninety-five cases of primary colorectal lymphomas that satisfied Dawson's criteria were identified from the clinical databases of 13 university hospitals in Korea. The mean age at the time of presentation was 51.1 years and the male:female ratio was 64:31. The clinical information, including endoscopic and histological characteristics, was retrospectively analyzed. Of the primary colorectal lymphomas, 78 cases (82.1%) were of B-lineage and 17 cases (17.9%) were of T-cell lineage. Patients with T-cell lymphomas presented at a younger age than patients with B-cell lymphomas (42.8 vs 52.9 years, respectively; *P* =



Endoscopic findings

Classification	B cell (n=63)	T cell (n=15)	All (n=78)
Fungating	34 (54.0%)	2 (13.3%)	36 (46.2%)
Ulcerative	3 (4.8%)	7 (46.7%)	10 (12.8%)
Infiltrative	5 (7.9%)	0	5 (6.4%)
Ulcerofungating	17 (27.0%)	1 (6.7%)	18 (23.1%)
Ulceroinfiltrative	4 (6.3%)	5 (33.3%)	9 (11.5%)

* P < 0.001



강북삼성병원 시절

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Detection of Colorectal Adenomas by Routine Chromoendoscopy With Indigocarmine

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Woo Kyu Jeon, M.D., Byung Ik Kim, M.D., and Eun Yoon Cho, M.D.

Departments of Medicine and Pathology, Sungkyunkwan University School of Medicine, Seoul, Korea

OBJECTIVES: Nonpolypoid adenomas, which can be important precursors of colorectal cancers, are difficult to find during routine colonoscopy. The aim of this study was to evaluate the usefulness of routine chromoendoscopy in Korea, where the incidence of colorectal cancer is low compared with western countries.

METHODS: Colonoscopy with chromoendoscopy was performed in 74 consecutive patients (48 men, 26 women; mean age 53.0 yr). After a careful examination of the whole colon, a defined segment of the sigmoid colon and rectum (0–30 cm from the anal verge) was stained with 20 ml of

can be found only after spraying contrast agent needs to be further investigated. (*Am J Gastroenterol* 2003;98:1284–1288. © 2003 by Am. Coll. of Gastroenterology)

INTRODUCTION

During the last decade, there has been an increasing interest in nonpolypoid colorectal neoplastic lesions (1–11). Such lesions are difficult to detect and are often overlooked during routine colonoscopic examinations, and it has been claimed that the true incidence of nonpolypoid neoplastic

큰 연구는 아니었습니다. 대장내시경 74개가 전부였습니다.

Table 1. Colorectal Lesions Detected Before and After Spraying Indigocarmine During Colonoscopic Examinations in 74 Patients

Histology	Before Dye Spraying	After Dye Spraying*	Total
Inflammation/hyperplasia	14	158	172
Tubular adenoma	41	17	58
Villous adenoma	1	0	1
Serrated adenoma	0	1	1
Adenocarcinoma	2	0	2
Total	58	176	234

매우 빨리 진행된 연구였습니다. 구상부터
투고까지 5개월 걸렸습니다.

ACKNOWLEDGMENT

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취직 후 처음에는 환자가 적어서 매일 도서관을 찾았습니다. 우연히 독일 논문을...

Original Article

1001

Chromoendoscopy with Indigocarmine Improves the Detection of Adenomatous and Nonadenomatous Lesions in the Colon

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Background and Study Aims: Depressed early cancers and flat adenomas have a high potential for malignancy with possible infiltrating growth, despite the small size of the lesion. Japanese investigators have shown that early diagnosis and classification of these lesions is possible with the help of chromoendoscopy. The aim of this study, therefore, was to evaluate the usefulness of chromoendoscopy during routine colonoscopy.

Patients and Methods: During routine colonoscopy, vital staining with indigocarmine solution (0.4%, 1–10 ml)

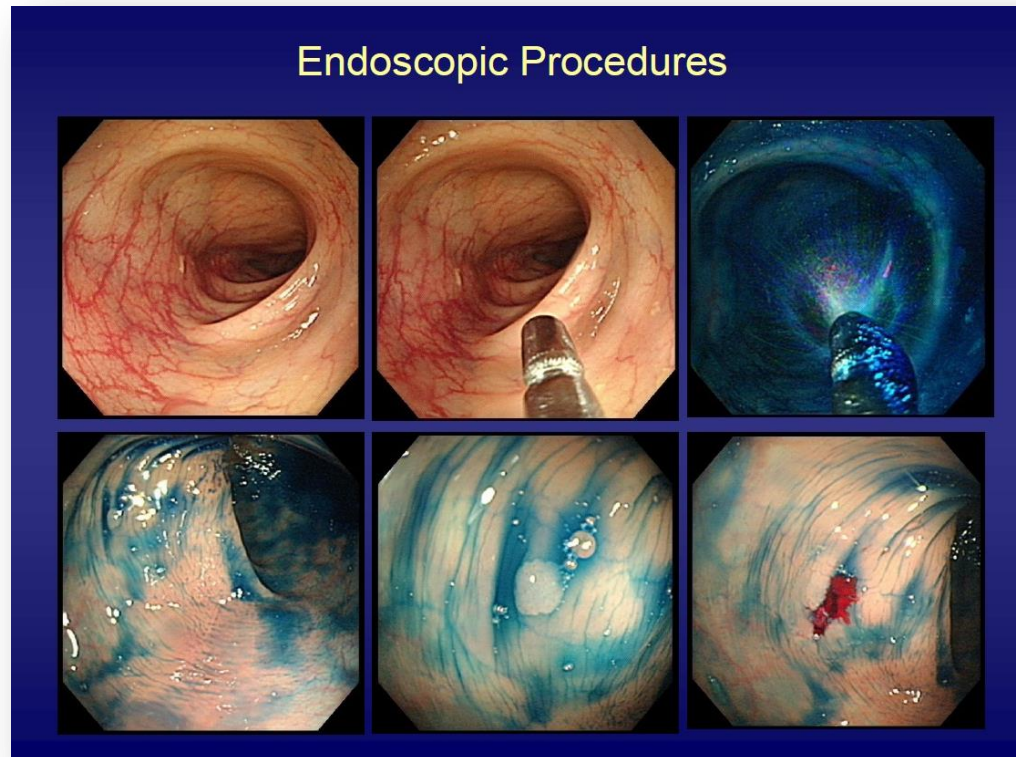
Results: A total of 52 patients had 105 visible lesions (89 polypoid, 14 flat and two depressed). The mean size of the lesions was 1.4 cm. Among the 48 patients with mucosa of normal appearance, 27 showed 178 lesions after staining (176 flat, two depressed) with a mean size of 3 mm. On histological investigation, 210 lesions showed hyperplastic or inflammatory changes, 67 were adenomas and six were cancers. Use of the pit pattern system to classify lesions (adenomatous, pit patterns III–V; nonadenomatous, pit patterns I–II) was possible, with a sensitivity of 92% and a specificity of 93%. Lesions

msung Medical Center. Urheberrechtlich geschützt.

대장암이 적은 우리나라에서는 어떨지 거의 같은 연구를 해 보았습니다.

OBJECTIVES: Nonpolypoid adenomas, which can be important precursors of colorectal cancers, are difficult to find during routine colonoscopy. The aim of this study was to evaluate the usefulness of routine chromoendoscopy in Korea, where the incidence of colorectal cancer is low compared with western countries.

방법은 간단했습니다. 대장내시경을 마친 후 30 cm 정도 들어가 색소를 뿌렸습니다.



2달 자료(50명)를 모아 ACG에 초록을 냈습니다. 포스터 전시로 accept 되었습니다.

DETECTION OF SMALL COLORECTAL ADENOMAS BY ROUTINE CHROMOENDOSCOPY WITH INDIGOCARMINE

2002년 6월 4일 ACG에 초록 내기 직전에 정리한 50명 data

강북삼성병원 소화기내과 이준행

전체 mean age 52.38 +/- 8.73

남자 32명 (age 51.56 +/- 8.05) 여자 18명 (53.83 +/- 9.90)

검사한 이유

15	check up
6	abdominal pain
9	diarrhea
4	constipation
7	polypectomy follow up
4	bleeding
5	others (weight looss, IDA work up..)

24명을 더 모아 ACG 포스터를 만들었습니다. 다. 동시에 논문을 써서 AJG에 보냈습니다.

DETECTION OF COLORECTAL ADENOMAS BY ROUTINE CHROMOENDOSCOPY WITH INDIGOCARMINE

Jun Haeng Lee, Jung Uk Kim, Yong Kyun Cho, Chung Il Sohn, Woo Kyu Jeon, Byung Ik Kim, and Eun Yoon Cho*

Departments of Medicine and Pathology *, Kangbuk Samsung Hospital, Sungkyunkwan University School of Medicine, Seoul, Korea

INTRODUCTION

During the last decade, there has been an increasing interest on the non-polypoid colorectal neoplastic lesions. Such lesions are difficult to detect and are often overlooked during routine colonoscopic examinations and it has been claimed that the true incidence of non-polypoid neoplastic lesions has been underestimated.

Recently, there has been a report from Germany that chromoendoscopy with indigocarmine may help detect small non-polypoid neoplastic lesions, which are not identified by routine video endoscopy. However, the incidence of colorectal neoplastic lesions is significantly different by geographic locations, and the role of routine chromoendoscopy in eastern countries has not been determined.

The aim of the present study was to evaluate the usefulness of routine chromoendoscopy in Korea, where the incidence of colorectal cancer is low compared to the western countries.

METHODS

Colonoscopy with routine chromoendoscopy using indigocarmine solution was prospectively performed in 74 consecutive patients. Mean age was 53.0 years (range 30-78, 48 male and 26 female).

Bowel preparation included 4 L polyethylene glycol electrolyte solution in the morning before an afternoon examination. Colonoscopic examinations were performed by three experienced endoscopists. Patients with insufficient bowel preparation, a family history of polyposis, evidence of recent bleeding, infectious or inflammatory diseases, total or subtotal strictures had been excluded from the study.

While retracting the instrument from the cecum down to the anus, biopsy samples were taken for all detectable lesions. The endoscope was introduced again up to 30 cm from the anal verge. During slow withdrawal of the endoscope, about 20 ml of indigocarmine solution (0.2%) were sprayed using a spraying catheter.

Then, the endoscope was introduced again up to the 30 cm from the anal verge, and the dye-sprayed mucosa of the rectosigmoid colon was examined in detail. All detected lesions were removed for histological examination by one or two biopsies.

Macroscopically, adenomas were classified into polypoid adenoma and non-polypoid adenoma. Non-polypoid adenomas were further divided into a flat adenoma and a depressed adenoma. Flat adenoma was defined as an adenoma with either plane or slightly raised areas with a diameter in the axis of the intestinal surface several times exceeding their height. Histologically, dysplasia in adenoma was divided into low and high grade according to the Vienna classification.

RESULTS

Indications for colonoscopy included routine check-up (21 patients), diarrhea or loose stool (14 patients), abdominal pain (12 patients), constipation (7 patients), bleeding (6 patients) and others (14 patients).

Before spraying indigocarmine, 58 lesions were found in 30 patients (43.2%) (Table 1). Of the 42 adenomas, 36 were tubular adenomas, 3 were tubular adenomas with high-grade dysplasia, and 2 were villous adenomas. Endoscopic features of the 42 adenomas were sessile type in 21 (50.0%), pedunculated type in 6 (14.3%), and non-polypoid flat lesions in 15 (35.7%). The mean diameter of adenomas were 5.4 ± 4.6 mm (range 3-30).

Table 1. Colorectal lesions detected before and after spraying indigocarmine in 74 patients

Histology	Before dye spraying	After dye spraying	Total
Inflammation /Hyperplasia	14	158	172
Tubular adenoma	41	17	58
Villous adenoma	1	0	1
Serrated adenoma	0	1	1
Adenocarcinoma	2	0	2
Total	58	176	234

After indigocarmine staining for normal-looking distal 30 cm colorectal mucosa, 176 lesions were found in 46 patients (Table 1). Macroscopically, all adenomas were classified as flat adenomas. There was no depressed-type adenoma. The mean size of the 18 adenomas found after spraying indigocarmine was 2.6 ± 0.6 mm, and significant smaller than the adenomas found before chromoendoscopy (p<0.001).

Table 2. Efficacy of routine chromoendoscopy in the detection of additional small adenoma(s) in patients with or without neoplastic lesions detected before spraying indigocarmine.

	Group A (n=25)	Group B (n=49)
Neoplastic lesions before dye spraying	Yes	No
All lesions detected after dye spraying	85	91
Adenomas detected after dye spraying	6	12
Patients with adenoma(s) after dye spraying *	6 (24.0%)	6 (12.2%)

* p=0.317, Fisher's exact test

CONCLUSIONS

We found that flat or depressed adenomas could be found after spraying indigocarmine for normal-looking rectosigmoid mucosa in a large proportion of patients in Korea. The clinical significance of these diminutive adenomas, which could be found only after spraying contrast agent, needs to be further investigated.

논문을 submission 한 후 우리말로 국내 학회에서 발표를 하였습니다.

대한소화기내시경학회지 2002;25:303

육안소견상 정상인 대장점막에서 색소내시경을 이용한 선종의 발견

성균관대학교 의과대학 강북삼성병원 내과, *병리과

이준행 · 김정욱 · 조용균 · 박창영 · 손정일 · 전우규 · 김병익 · 조은윤*

연구목적: 대장내시경 검사에서 대장암의 전구병변의 하나인 비용종형 선종을 발견하는 것은 쉽지 않다. 본 연구는 내시경검사상 육안적으로 정상인 대장점막에 대한 색소내시경의 유용성을 알아보는 것을 목적으로 하였다. 대상 및 방법: 74명의 환자(남자 48명, 여자 26명; 평균 연령 53.0세)에서 색소내시경 검사를 시행하였다. 대장내시경 검사를 시행한 이유는 건강검진(21%), 설사나 무른변(14%), 변비(7%), 출혈(6%), 기타(14%) 등이었다. 맹장부터 직장까지 자세한 대장내시경 검사를 시행한 후 내시경을 항문연으로부터 30 cm까지 다시 삽입하였다. 천천히 내시경을 빼면서 0.2% indigocarmine 용액을 대장점막에 골고루 살포하였다. 다시 내시경을 삽입하여 색소가 살포된 대장 점막을 자세히 관찰하면서 발견된 병변을 기술하고 조직검사를 시행하였다. 결과: 색소살포전 대장내시경 검사에서 30명(43.2%)의 환자에서 58개의 병변이 발견되었다. 조직학적 소견은 관상 선종 41개, 증식성 혹은 염증성 변화 14개, 선암 2개, 용모상 선종 1개였다. 육안적으로 정상적인 원위부 대장점막에 색소를 살포한

첫 논문에서 배운 교훈

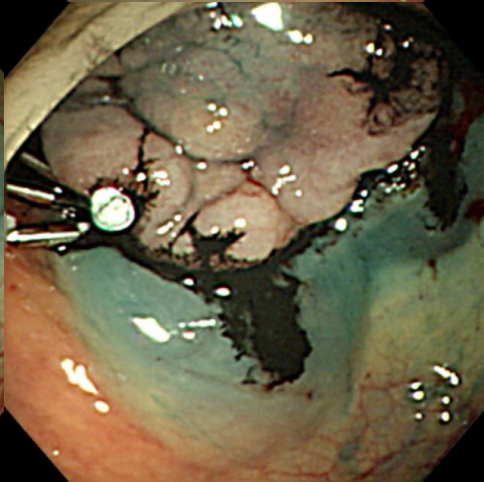
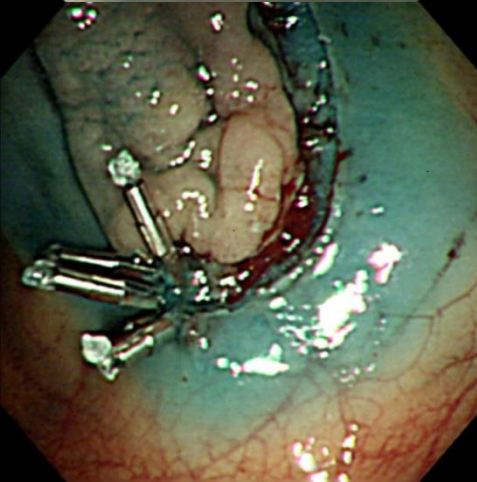
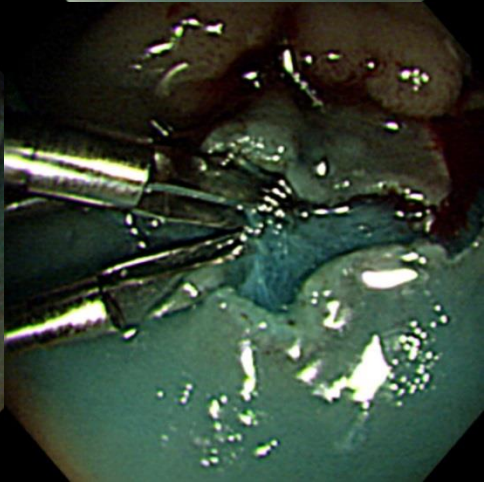
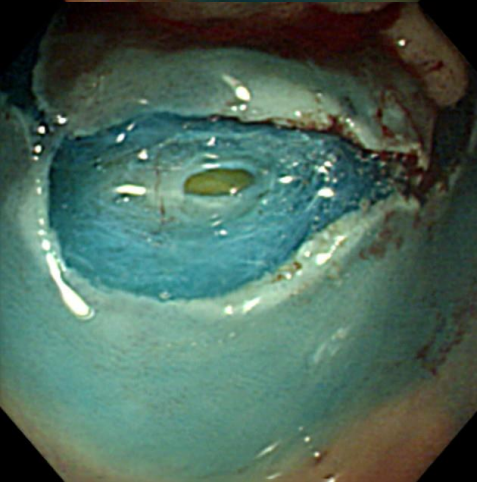
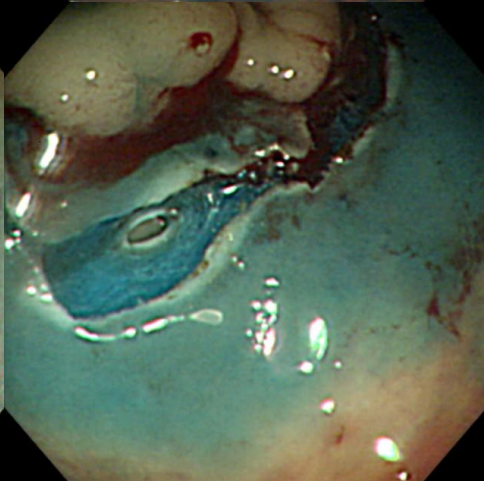
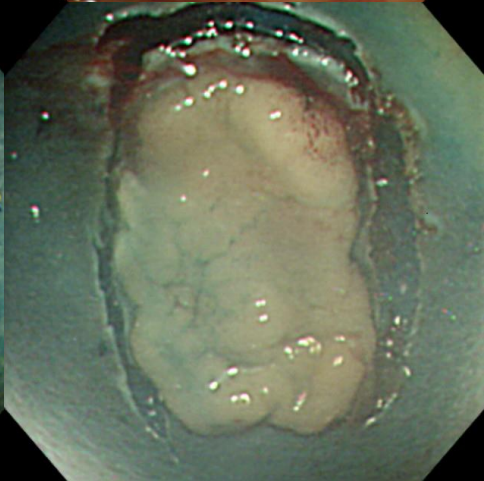
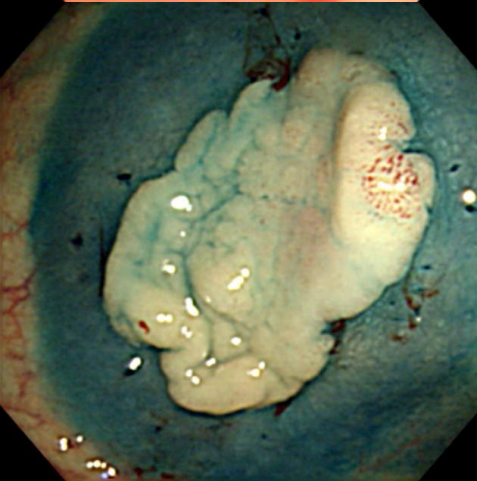
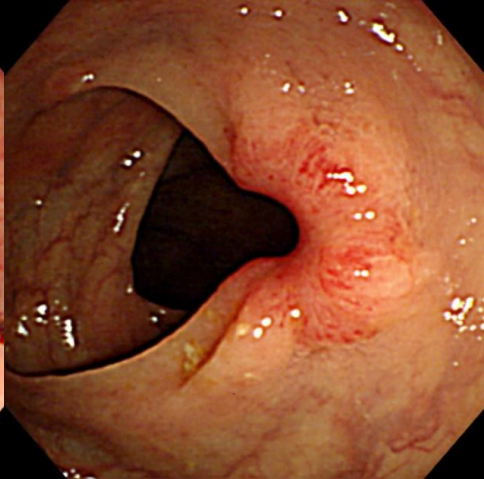
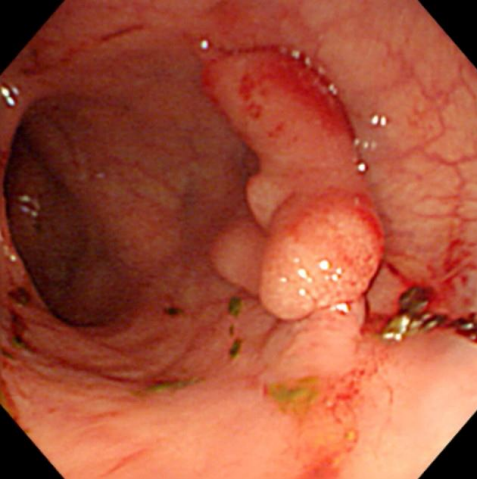
- 평소의 관심 (색소내시경)
- 최신 문헌 검토
- 쉬운 방법론 (대장내시경, 색소내시경)
- 신속한 진행
- Something new에 집착하지 않음
- Me too에 개의치 않음

대장내시경과 나 (2) : 변절 후

- 전공의 4년차 시절
- 군의관 시절 - 대항병원 신건성 선생님
- Fellow 시절
- 강북삼성병원 의사 시절
- 삼성서울병원 junior
- 삼성서울병원 middle man
- 삼성서울병원 senior

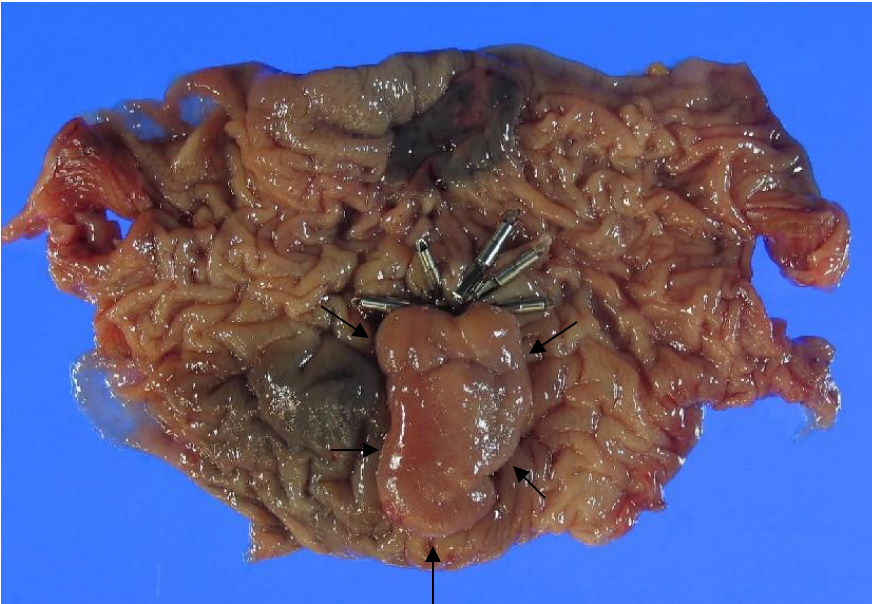
변절 후

성균관대학교 의과대학 삼성서울병원 소화기내과





- Adenocarcinoma (M/D)
1.5 x 1 cm, extension to submucosa
no nodal metastasis



- Tubulovillous adenoma
2.3 x 1.8 cm, negative resection margins

Cecal insertion time and colorectal neoplasm detection (1/4)

- The mean cecal insertion time was 5.9 (SD, 4.4 minutes).
- We identified 4,249 (33.5%) participants with colorectal neoplasms, of whom 1,956 had small single adenomas (<5 mm), 595 had medium single adenomas (5–9 mm), and 1,699 had multiple adenomas or advanced colorectal neoplasms.
- The overall rates of colorectal neoplasm detection by quartiles of cecal insertion time were 36.8%, 33.4%, 32.7%, and 31.0%, respectively (p trend <0.001).

Cecal insertion time and colorectal neoplasm detection (2/4)

- The odds for small single colorectal adenoma detection was 16% lower (adjusted OR 0.84; 95% CI 0.71 to 0.99) in the fourth compared to the first quartile of insertion time (p trend 0.005).
- Insertion time was not associated with the detection rate of single adenomas ≥ 5 mm, multiple adenomas or advanced colorectal neoplasms.

Cecal insertion time and colorectal neoplasm detection (3/4)

Table 2 Colorectal neoplasm detection by quartile of colonoscopy cecal insertion time (N = 12,679)

	N (%)	Quartiles of cecal insertion time, % (SE%)				P value
		First (<3.1 min)	Second (3.1-4.6 min)	Third (4.7-7.1 min)	Fourth (≥7.2 min)	
No colorectal lesion	8,429 (66.5)	63.2 (0.8)	66.6 (0.9)	67.3 (0.8)	69.0 (0.8)	
Any colorectal lesion detection	4,250 (33.5)	36.8 (0.8)	33.4 (0.9)	32.7 (0.8)	31.0 (0.8)	<0.001
Small single adenoma, <5 mm	1,956 (15.4)	17.7 (0.7)	15.1 (0.7)	14.9 (0.6)	13.9 (0.6)	<0.001
Medium single adenoma, 5-9 mm	595 (4.7)	4.7 (0.4)	4.7 (0.4)	4.8 (0.4)	4.6 (0.4)	0.86
Multiple adenomas or advanced colorectal neoplasm	1,699 (13.4)	14.4 (0.6)	13.6 (0.6)	13.0 (0.6)	12.5 (0.6)	0.019

Cecal insertion time and colorectal neoplasm detection (4/4)

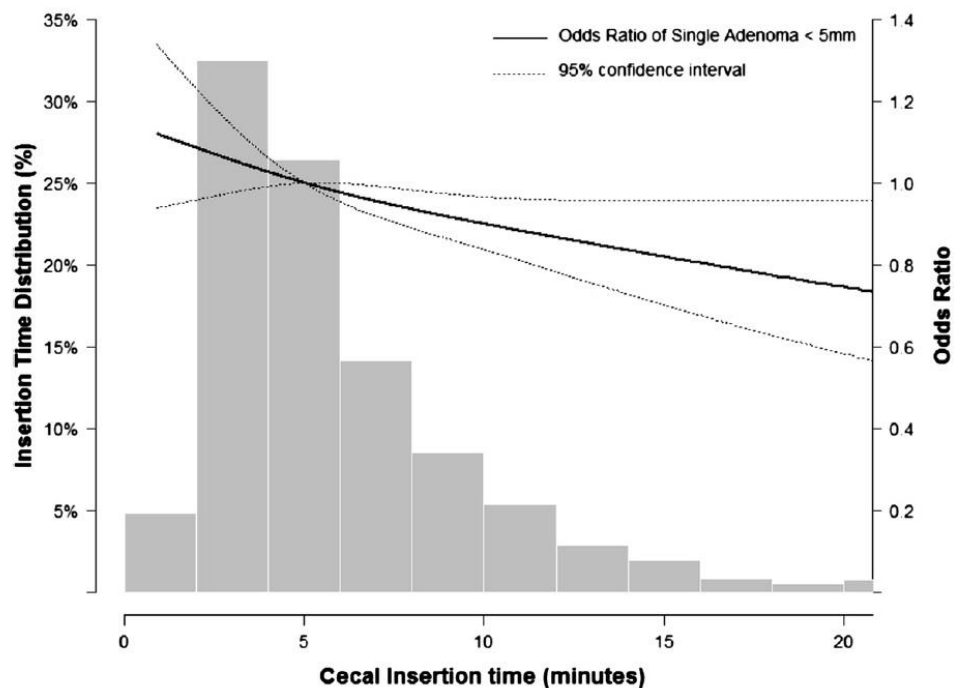


Figure 1 Prevalent odds ratio of single colorectal adenoma < 5 mm. Adjusted relative prevalence odds ratios derived from spline logistic regression models using restricted cubic splines with knots at the 10th, 50th, and 90th percentiles of the distribution of the insertion time distribution. The reference value (odds ratio = 1) was set at the 5th minute of insertion time. Prevalent odds ratios were adjusted for age, sex, body mass index, waist circumference, family history of colorectal cancer, history of colorectal polyp, diabetes mellitus, hyperlipidemia, aspirin medication, other NSAID medication, calcium supplementation, alcohol use, smoking history, colonoscopist, and bowel preparation (see Table 3 for details).

Ex-expert로부터 배우기

성균관대학교 의과대학 삼성서울병원 소화기내과

Reference를 활용합니다.



The screenshot shows a web browser window with the URL <http://endotoday.com/endotoday/inserting.html>. The page content is as follows:

↑ [References]

- 1) 대장정결 (2015년 내시경세미나, 원주의대 김현수) - [강의 동영상](#)
- 2) (환자용) 대장정결 설명 YouTube 동영상 (2016년 삼성서울병원 건강검진센터 김남인)

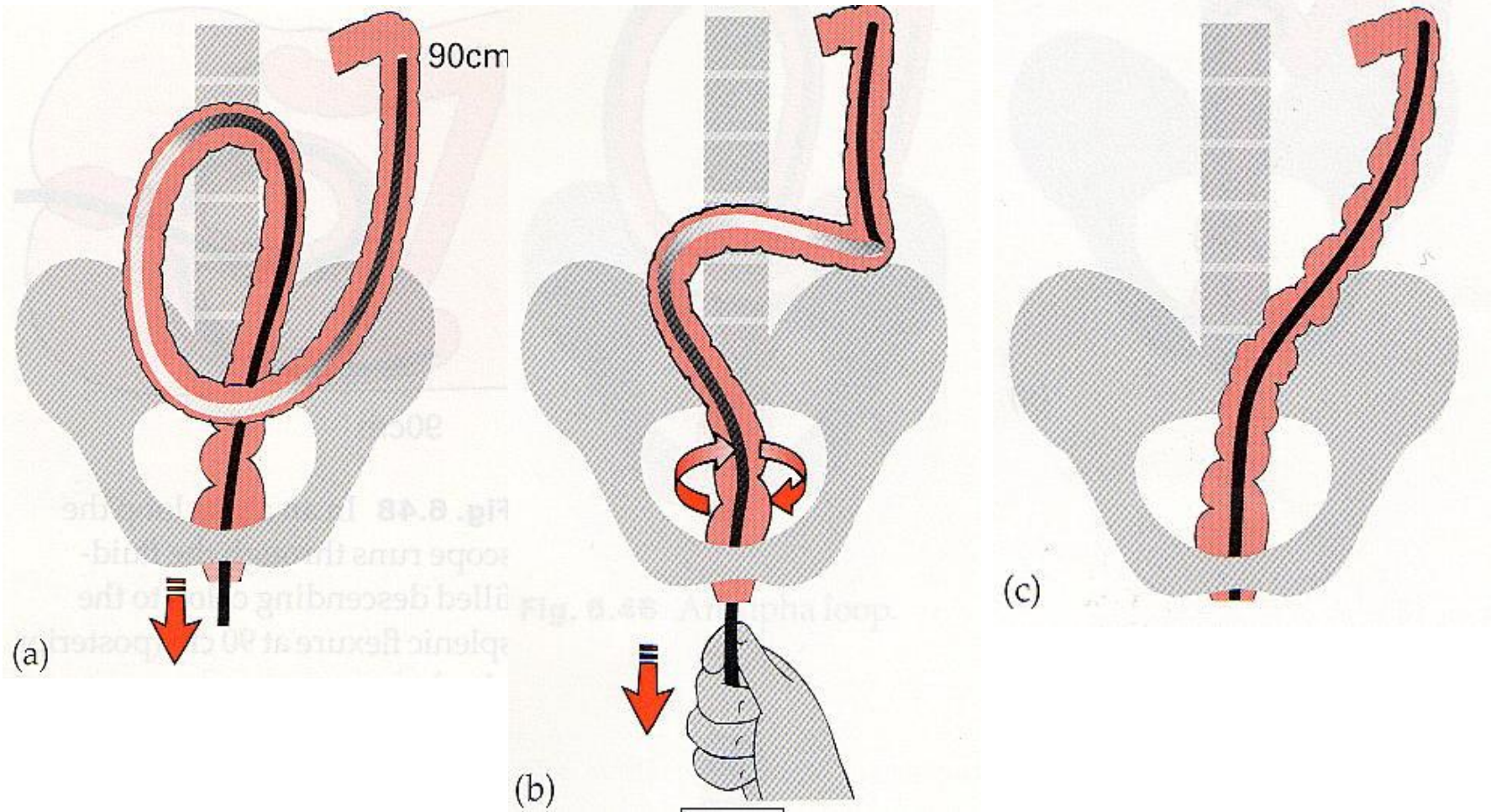


대장내시경 검사를 위한
Clean 장 준비

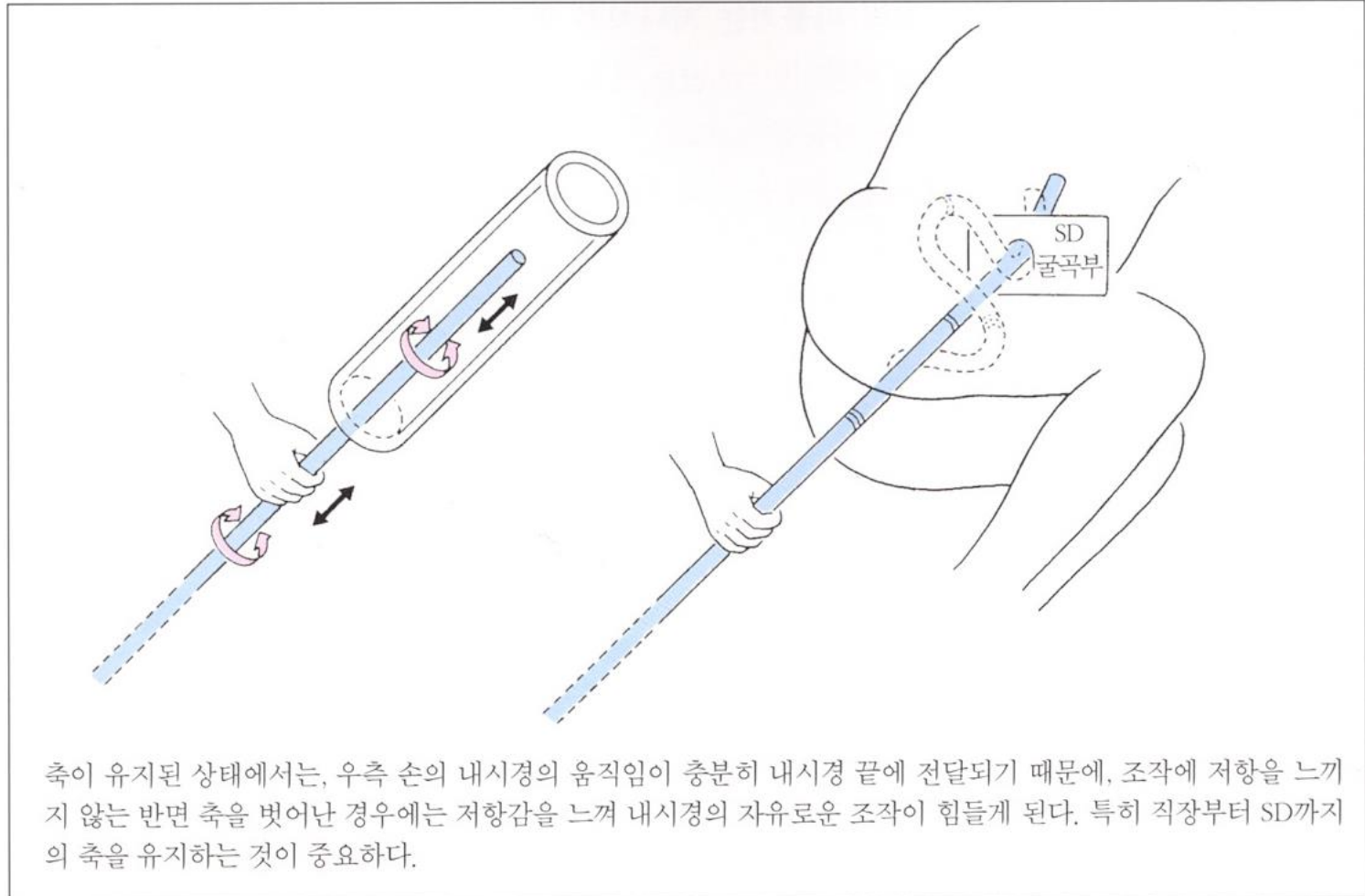
- 3) 안전하고 편안한 대장내시경 삽입법 (2015년 내시경세미나, 서울대학교 김지원) - [강의록 PDF](#), [강의 동영상](#)
- 4) 빠짐없고 정확한 대장내시경 관찰법 (2015년 내시경세미나, 울산대학교 김경조) - [강의 동영상](#)
- 5) [YouTube에 소개된 대장내시경 삽입법](#)
- 6) [EndoTODAY Lecture note for EGD simulator training](#)
- 7) 한동수, 내시경 삽입 곤란 예외 검토 (내시경세미나 2003)
- 8) 예병덕, [체위 변환과 복부 압박](#) (내시경학회 세미나)
- 9) [대장내시경 삽입법 textbook](#) (내부용, 암호 있음)

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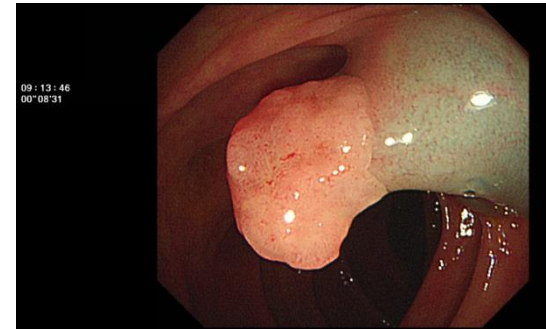
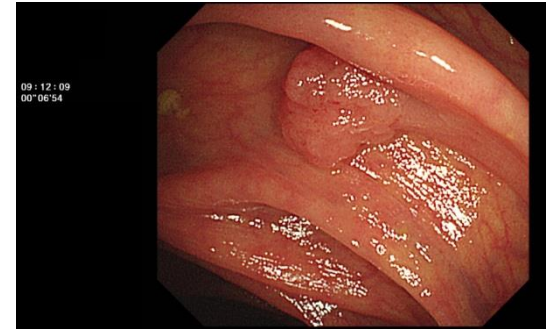
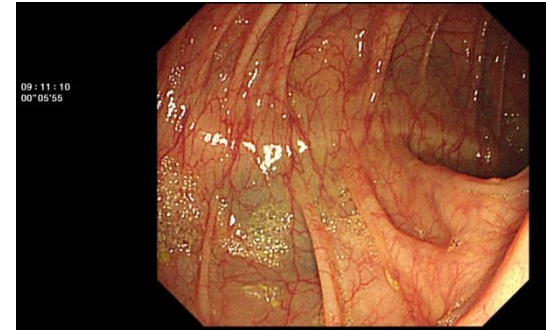
술기를 적용합니다.



내시경 조작의 무저항감

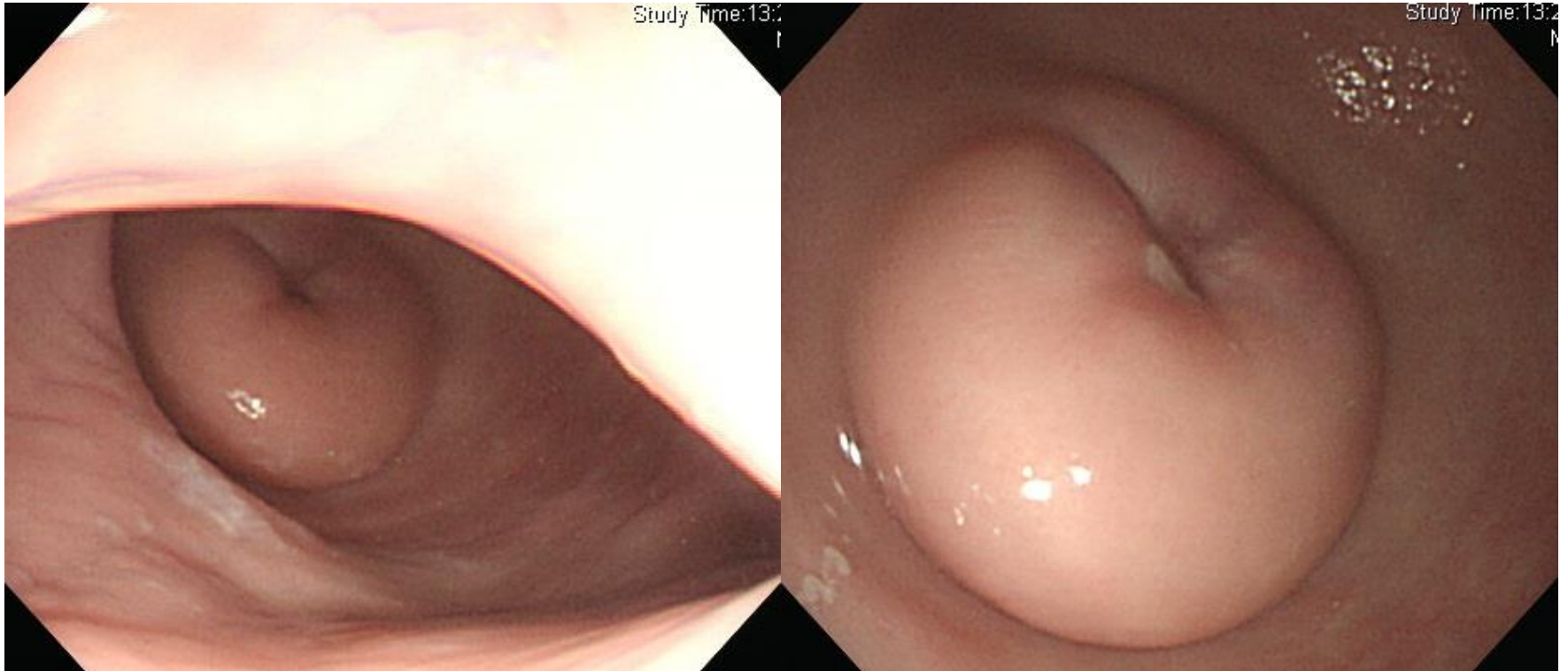


Blind area in colonoscopy

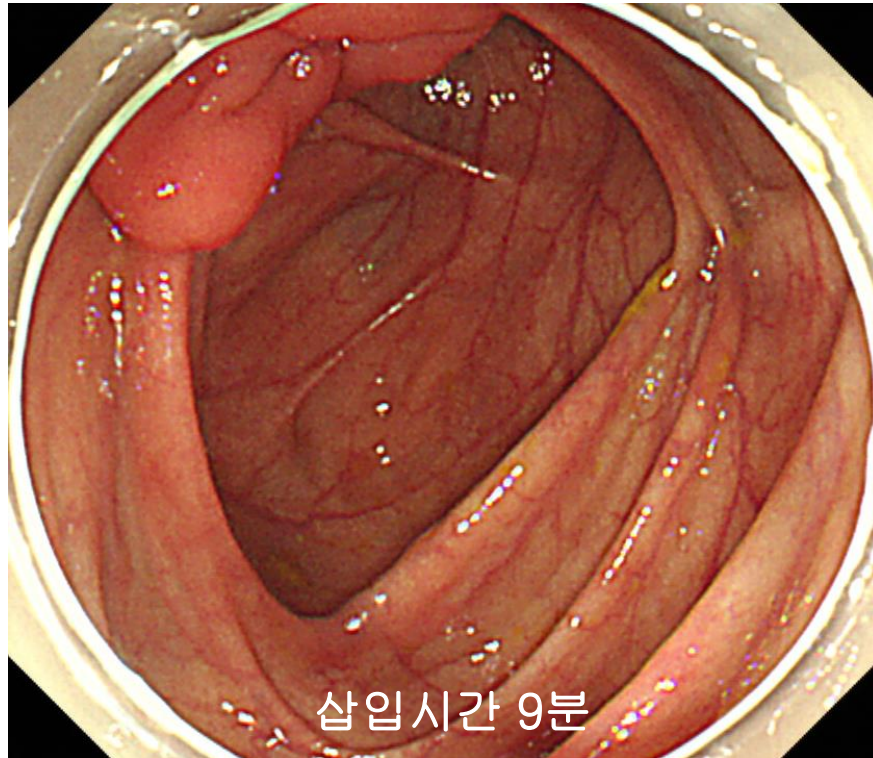


A colon을 두번째 관찰하면서 발견한 선종

대장내시경으로 관찰한 uterine cervix



환자와 의사의 궁합

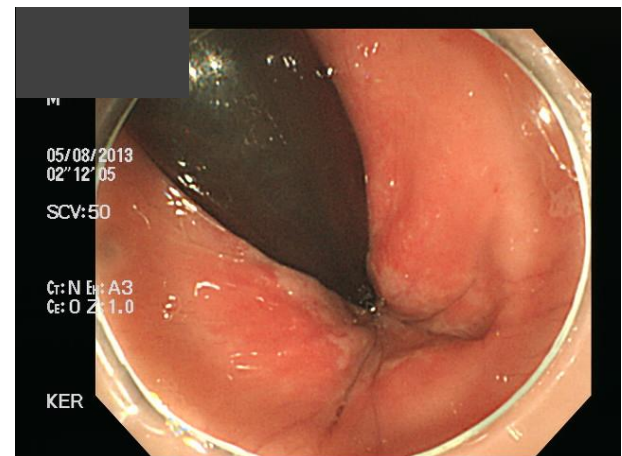
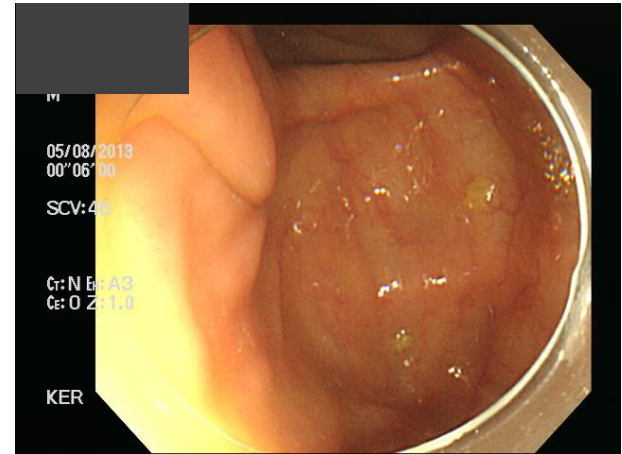
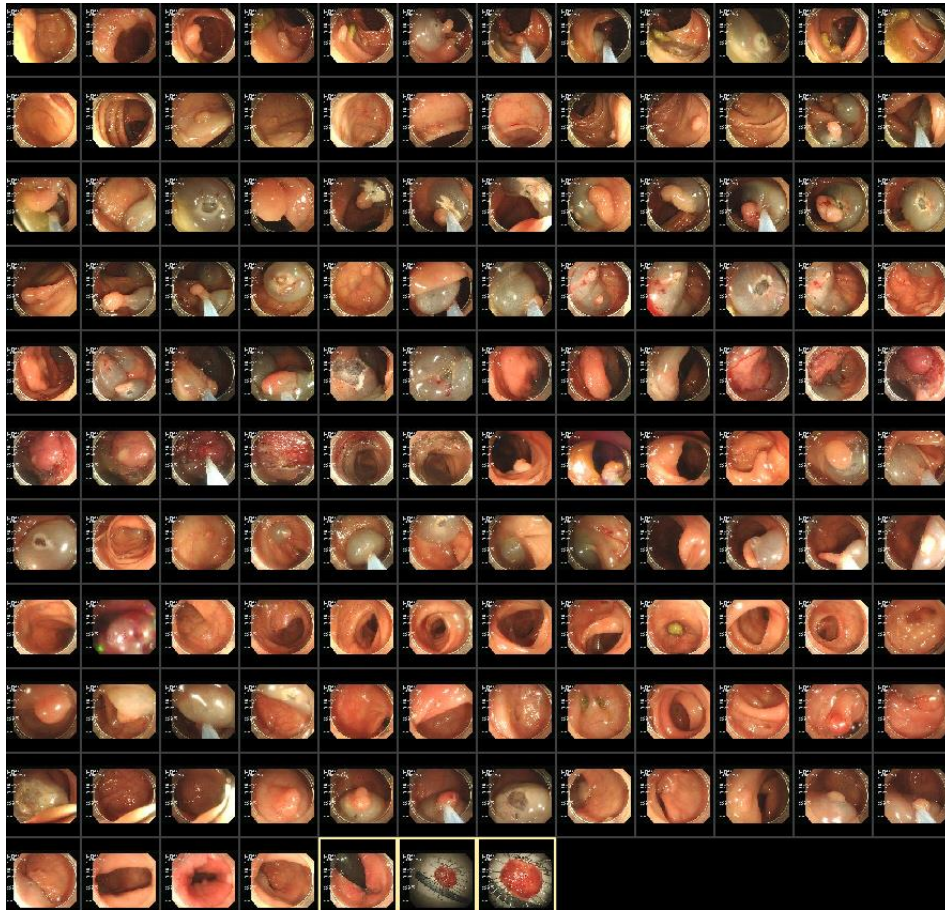


삽입시간 9분

언제까지 검사를 할 것인가



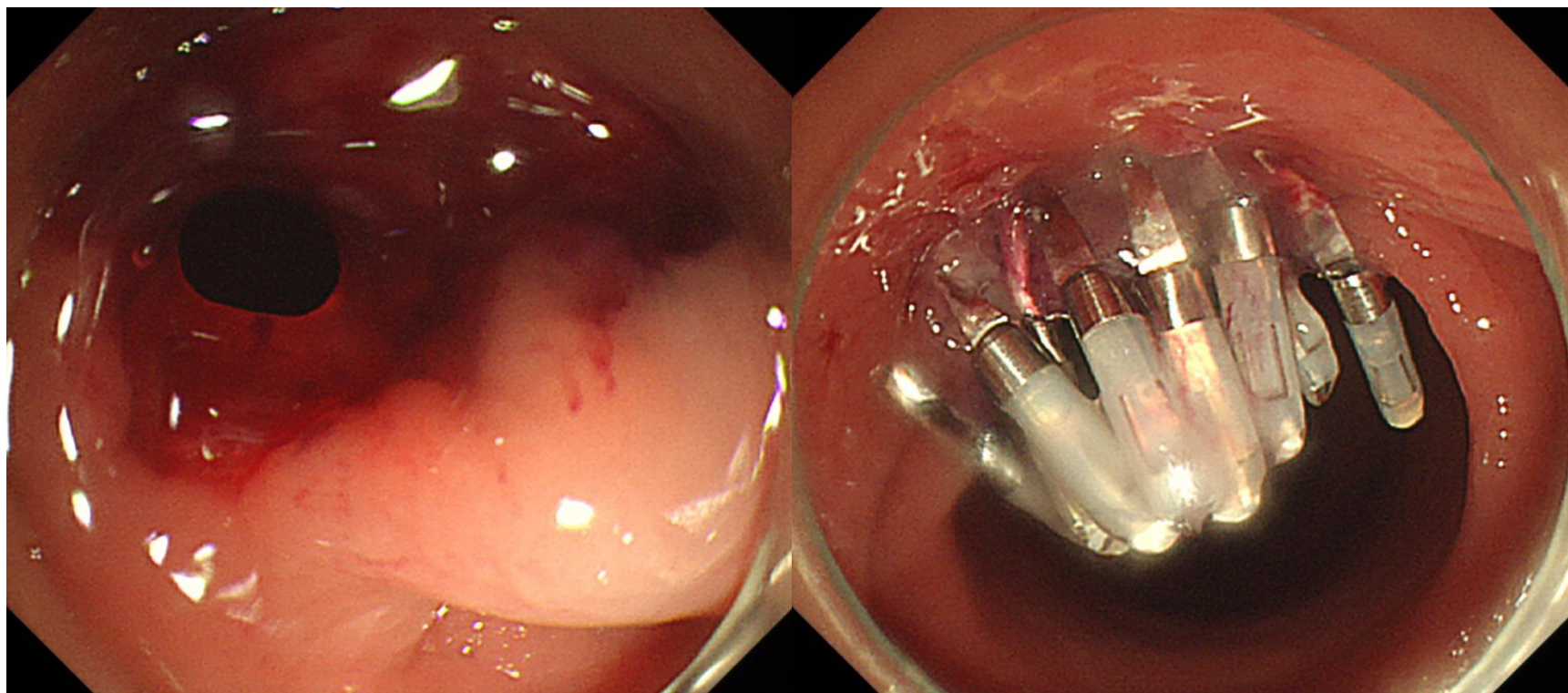
매우 많은 용종절제술 (2시간 20분)



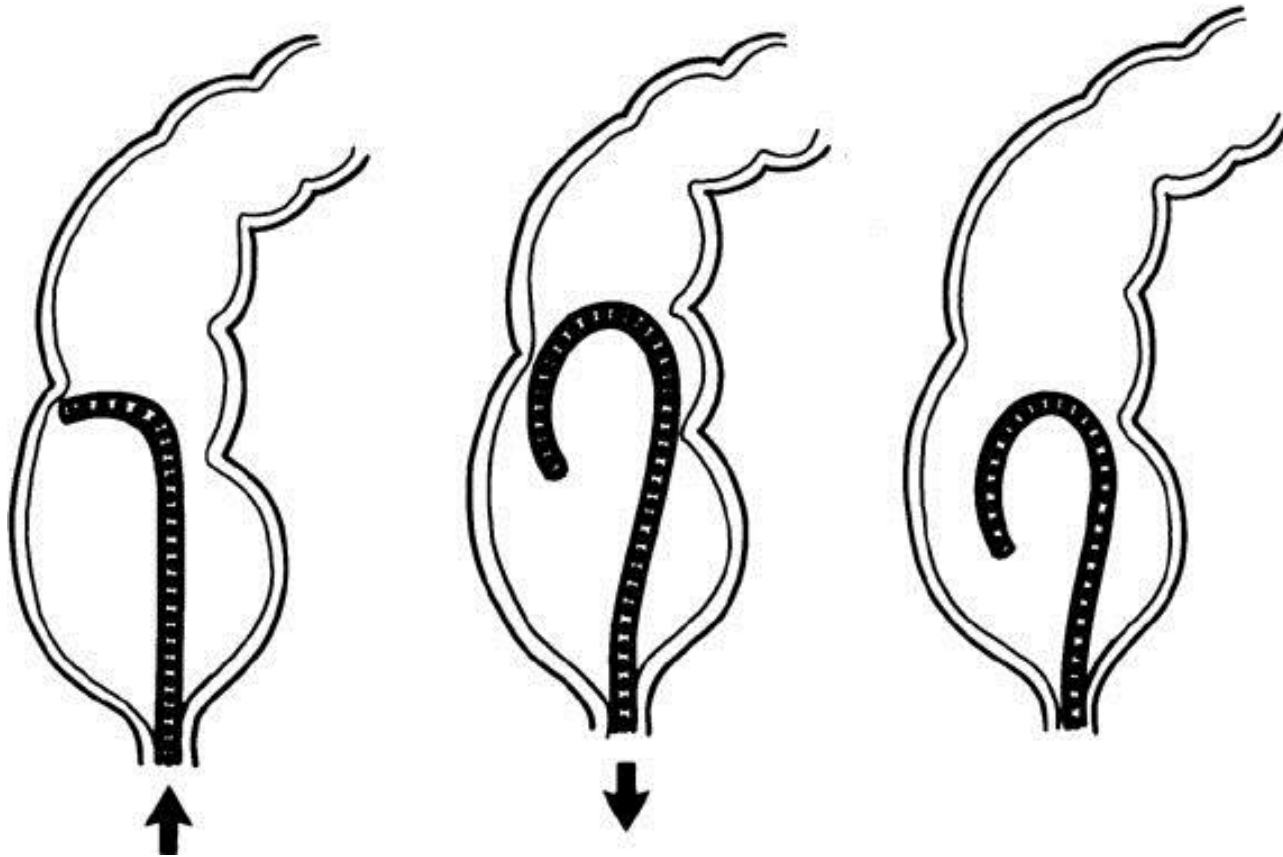
Perforation d/t diagnostic colonoscopy

날짜	천공위치		성별	나이	BMI	검사 목적	기저질환	복부 수술력
2016.01.28	Sigmoid	삽입중	F	68	22.7	w/u	없음	없음 (CT상 huge ovarian mass with S colon invasion의심)
2015.05.20	Sigmoid	삽입중	F	75	17.59	IDA w/u	S/P MVR, TAP, Maze op, CKD	없음.
2014.02.20	Sigmoid	삽입중	M	73	18.7	RC	없음	없음
2014.03.26	Sigmoid	삽입중	M	65	21.8	IDA w/u	NSTEMI, IDA	Op. for DU perforation(20년전)
2014.06.10	Sigmoid	삽입중	F	67	29.9	surveillance	HTN	LAVH c LPL c RSO c Lt.salpingectomy c adhesiolysis (2005.6.8)
2014.08.29	Sigmoid	삽입중	F	67	25.36	Surveillance for s/p ESD for colon cancer	DM, HTN	TAH d/t uterine myoma(1992) appendectomy d/t appendicitis(40년전)
2014.12.09	Sigmoid	삽입중	F	71	19.22	RC	HTN	LDKT (2001.10.09), DDKT (2013.11.06)
2014.12.19	Sigmoid	삽입중	F	66	22.98	ACUP w/u	HTN	(특이사항: 외부병원에서 w/u위해 colonoscopy 시행 중 adhesion 심해 fail 한 기왕력 있었음)
2014.04.01	Rectum	J turn	F	80	16.2	IDA w/u	Parkinsonism	없음
2014.07.01	Rectum	J turn	F	77	23.2	Rectal cancer w/u	DM, HTN	없음
2013.02.15	Sigmoid	삽입중	M	73	17.79	Lymphoma,cecum	간염	TG, radical nephrectomy
2013.10.04	Sigmoid	삽입중	F	71	22.44	Anemia w/u	Stable angina	없음.
2013.12.11	RS junction	삽입중	F	73	18.19	CT 상 Foreign body 의심	HTN 자궁암으로 방사선치료	

Upper rectum retroflexion 과정에서 천공 되어 clipping



Examination of Anus



집으로 가져가는 메시지

- 충분한 bowel preparation
- 가능한 한 공기를 적게 넣는다
- 삽입보다는 shortening (accordion을 잊지말자)
- rotation과 right-turn shortening을 적절히 이용
- 첫 1-2분이 중요하다
- 같은 동작을 3회 이상 시행하지 않는다
- 자세변환과 compression을 적절히 이용한다
- 5-10 %에서는 cecum에 도달할 수 없으므로 절대로 무리하지 않는다
- 병변을 자세히 기록한다