

Difficult Polypectomy

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용종절제술, 무엇이 문제인가?

송도병원 외과

김 현 식

용종절제술은 합병증이 없고 잔존 병변을 남기지 않으면서 안전하게 시행되어야 한다. 그러기 위하여서는 대장내시경과 용종절제술에 대한 기본 지식과 기술을 숙지하여야 한다. 이 논문에서는 저자의 경험을 중시한 기본 원칙과 요령에 대하여 언급하였으며 특히 거대 용종을 비롯하여, 편평용기형 종양과 함몰형 종양의 내시경적 절제에 대하여 기술하였다. 또한 1996년부터 2002년까지 송도병원에서 시행한 12,927 용종절제술 예에서 거대 용종과 내시경적 절제 후의 합병증에 대하여 분석하였다. 거대용종은 123예로 총 용종절제 예의 1%에 해당되었는데 이 중 52%에서 분할 절제술이 시행되었고, 27.6%에서는 외과적 수술이 필요하였다. 그리고 조직학적으로는 18.7%가 점막하 침습암이었다. 또 합병증으로는 지연 출혈이 30예로 0.23%에 해당되었고 대부분 절제 후 1주일 이내에 발생했으며 절제 다음날과 그 다음날에 가장 많았다. 이들은 주로 클립을 사용하여 내시경적으로 지혈시켰다. 결론적으로, 안전하고 확실한 용종 절제를 위하여서는 대장내시경과 용종절제술에 대한 기본 원칙과 요령을 습득하도록 해야 하며 특히 거대 용종, 편평한 병변, 그리고 함몰형 종양에 대하여서는 특별한 고려가 요구된다고 하겠다. J Korean Soc Coloproctol 2003;19: 399-405

Key Words: Colonoscopy, Polypectomy, Large polyp, Complication, Delayed bleeding
대장내시경, 용종절제술, 거대 용종, 합병증, 지연 출혈

Introduction

A difficult polypectomy is a safe polypectomy.

A safe polypectomy is a complete polypectomy without complications like bleeding or perforation.

Principles of and Tips for Colonoscopy & Polypectomy in General

In order to do a safe polypectomy, the basic principles and techniques of colonoscopy must be set forth beforehand. I am going to discuss several points of consideration based on my experience.

- 1) Concentration, relaxation, and self-confidence are important.
- 2) If you are not in the mood for the procedure, don't do it.
- 3) Keeping the colonoscope straight is important for free and easy maneuverability of the instrument.^{1,2}
- 4) Prepare all instruments or accessories for the polypectomy and for possible complications beforehand.
- 5) Good bowel preparation with a clear & complete field should be secured.
- 6) If you think the procedure has become beyond your ability, convert to an operation or transfer.
- 7) Do not overinflate the colon; that may perforate the bowel through the thin wall.
- 8) For a large polyp, a piecemeal method or a periodic polypectomy should positively be considered.

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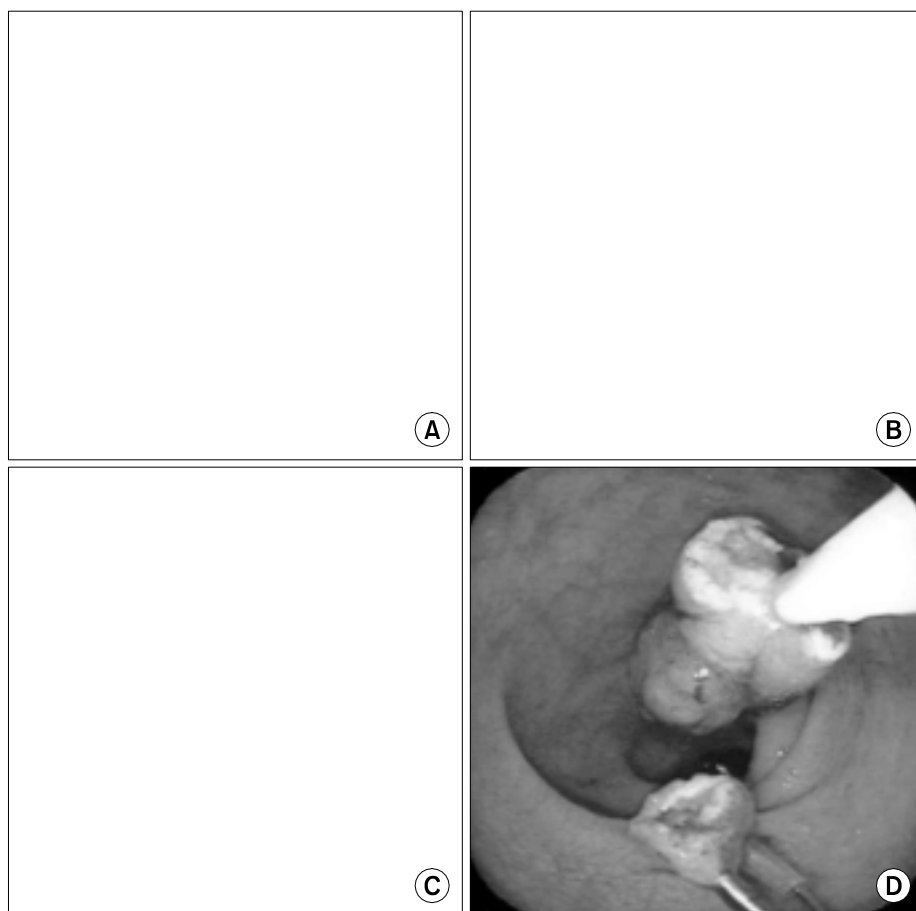


Fig. 1. A. A pedunculated polyp in the sigmoid colon of a 58-year-old male patient. B. A hemoclip was applied at the stalk. C. A detachable snare was applied below the hemoclip to prevent slippage of the snare. D. The polyp was ensnared and resected. Notice that no bleeding occurred along the cut margin. Pathology showed a tubular adenoma.

9) For pedunculated polyps, hemoclips and detachable snares should be applied. An example of a polypectomy for a pedunculated polyp is shown in Fig. 1.

10) For a flat or depressed lesion, an endoscopic mucosal resection (EMR) technique should be taken into account.³

11) For patients in whom colonoscope insertion is difficult, care should be exercised in deciding whether a polypectomy should be done or not because not only will the procedure itself be difficult but also management of possible complications, if any, will be difficult.

12) Trained assistants are essential.

13) A polyp should be positioned at 6' o'clock because the operating channel in the colonoscope is at that position. If it is difficult to secure a good colonoscopic position or view, you had better abandon the procedure.

14) If a lesion is over 1.5~2.0 cm, consider a piecemeal resection. When you start a piecemeal polypectomy, begin at the most accessible site; also, 1.0 to 1.5 cm is an appropriate and safe size for each piece.

15) Cauterization can cause deeper necrosis than you imagine.

16) If a polyp involves the appendix, convert to an operation.

17) If a lesion is too close to the anal canal, a transanal excision is much better and safer.

18) Be cautious when you consider a polypectomy for an old and frail patient.

Polypectomy for Large Polyps

There are some difficulties when you encounter large polyps, flat or depressed lesions.

You have to keep some tips in your mind for those lesions.

There are special considerations for large polyps. Large polyps usually refer to ones which are 3.0 cm or larger.^{4,5} Reportedly, 3 to 8% out of the total polypectomies involve large polyps.⁵

1) Whether you resect endoscopically or not depends

on the likelihood of malignancy and the feasibility of safe excision.

2) The likelihood of malignancy for a large polyp depends on visual judgement and instrumental palpation rather than biopsy. False positive or false negative biopsy results may mislead the treatment.

3) If needed, don't hesitate to select a piecemeal polypectomy. Some authors reported that 76% of 33 lesions larger than 3 cm were treated by piecemeal techniques.⁶

4) While doing a piecemeal polypectomy, when the visual field is disturbed by resected pieces of a polyp, it is safe to consider multiple sessions. A 2- to 4-week interval between sessions is appropriate.

5) When retrieving specimens, obtaining a piece including the resection margin from the bowel wall should have the highest priority.

6) For large pedunculated polyps, use hemoclips and/or detachable snares to prevent bleeding. When you snare after application of hemoclips or detachable snares, use the cutting current to prevent burning the area tightened by those hemostatic devices.

In Song Do hospital, we experienced 12,927 polypectomies from 1996 to 2002. Among them, 123 (1%) involved large polyps. The mean age of the large-polyp group was 58 years old. The male-to-female ratio was 1 to 1 (Table 1A). The most common age groups were the 60's and 50's, accounting for 64.2%. Those in their 70's or older accounted for 12.2%, and those younger than 30 for 4.1% (Table 1B). The most common sizes ranged from 3 cm to 3.9 cm, amounting to 64.2%. The most common shape was sessile, accounting for 43.1%; next was semipedunculated, accounting for 26.8% (Table 1C).

Table 1A. Patients' characteristics (N=123)

Mean age			
58 (8~85) years old			
Male-to-Female ratio			
1 : 1			
Site distribution			
Cecum	3	Descending colon	3
Ascending colon	4	Sigmoid colon	24
Transverse colon	3	Rectum	86
Size (cm)			
3.0~3.9	79		
4.0~4.9	24		
5.0≤	20		
Configuration			
Pedunculated	15		
Semipedunculated	33		
Sessile	53		
LST	22		
Treatment			
Polypectomy	16		
Piecemeal polypectomy	64		
EMR	2		
EPMR	7		
Surgery	34		
Pathology			
Tubular adenoma	5	mca	47
Tubulovillous adenoma	14	smca	23
Villous adenoma	23	Miscellaneous	7
Serrated adenoma	4		

LST = laterally spreading tumor; EMR = endoscopic mucosal resection; EPMR = endoscopic piecemeal mucosal resection; mca = mucosal cancer; smca = submucosal cancer.

Table 1B. Age & sex distributions

Age	Male	Female	Total	%
< 30	1	4	5	4.1
30~39	3	0	3	2.4
40~49	9	12	21	17.1
50~59	17	14	31	25.2
60~69	29	19	48	39.0
70≤	3	12	15	12.2
Total	62	61	123	100

Table 1C. Relationship between size and configuration

Size (cm)	Configuration					%
	Ped	Semiped	Sessile	LST	Total	
3.0~3.9	12	22	31	14	79	64.2
4.0~4.9	2	6	12	4	24	19.5
5.0~	1	5	10	4	20	16.3
Total	15	33	53	22	123	
%	12.2	26.8	43.1	17.9		100

Ped = pedunculated; Semiped = semipedunculated; LST = laterally spreading tumor.

As to treatment modality, the most common type was a piecemeal polypectomy, showing 52%, and next was surgery, showing 27.6%. An EMR technique was involved in 7.3% of the cases, including endoscopic piecemeal mucosal resection (Table 1D). The overall cancer rate was 56.9%, and the submucosal cancer rate was 18.7%. Even though a serrated adenoma is rare, serrated adenomas showed 3.3% (Table 1E).

EMR for Flat or Depressed Lesions

An endoscopic mucosal resection (EMR) technique is the best way to resect flat or depressed lesions, and

Table 1D. Relationship between configuration and treatment

Treatment	Configuration					%
	Ped	Semiped	Sessile	LST	Total	
Polypectomy	8	8	0	0	16	13.0
Piecemeal polypectomy	0	15	35	14	64	52.0
EMR	0	1	0	1	2	1.6
EPMR	0	1	2	4	7	5.7
Surgery	7	8	16	3	34	27.6
Total	15	33	53	22	123	
%	12.2	26.8	43.1	17.9		100

Ped = pedunculated; Semiped = semipedunculated; LST = laterally spreading tumor; EMR = endoscopic mucosal resection; EPMR = endoscopic piecemeal mucosal resection.

Table 1E. Pathologic results of large polyps

Pathology	Number	%
Tubular adenoma	5	4.1
Tubulovillous adenoma	14	11.4
Villous adenoma	23	18.7
Mucosal cancer in tubular adenoma	6	4.9
Mucosal cancer in tubulovillous adenoma	15	12.2
Mucosal cancer in villous adenoma	26	21.2
Submucosal cancer	23	18.7
Serrated adenoma	4	3.3
Miscellaneous	7	5.7
Total	123	100

several important points must be remembered for an EMR.

1) For an sm cancer, a piecemeal EMR is not appropriate; however, if an EMR is needed to resect the lesions, the probable invasive area should be resected in one piece.

2) When the current does not cut well, you have to consider that the proper muscle layer is snared together and achieve safe snaring again.

3) When doing a piecemeal resection, the probable invasive area should be resected first. That would be safer and more convenient.

4) Using the pure cutting current would be safer.

cf: Ahmad NA et al.⁷: blend current

Inoue H et al.⁸: pure coagulation current

5) A preliminary biopsy is not appropriate for a future EMR because it causes fibrosis and makes the next stage EMR difficult. Here is a good example of an EMR technique for a depressed lesion (Fig. 2).

Complications after a Polypectomy

To perform a safe polypectomy you have to know about the complications, also.

The most important complications are bleeding and perforation. I am going to present some data from reports about these complications, as well as some of our results.

The delayed bleeding rate is reportedly 0.2~1.8%.⁹ In Song Do hospital, we experienced 30 delayed bleedings in 12,927 polypectomies from 1996 to 2002, showing a 0.23% delayed bleeding rate.

Table 2A. Site distribution of resected lesions in delayed bleeding

Site	Number
Cecum	1
Ascending colon	12
Transverse colon	4
Descending colon	2
Sigmoid colon	6
Rectum	5
Total	30

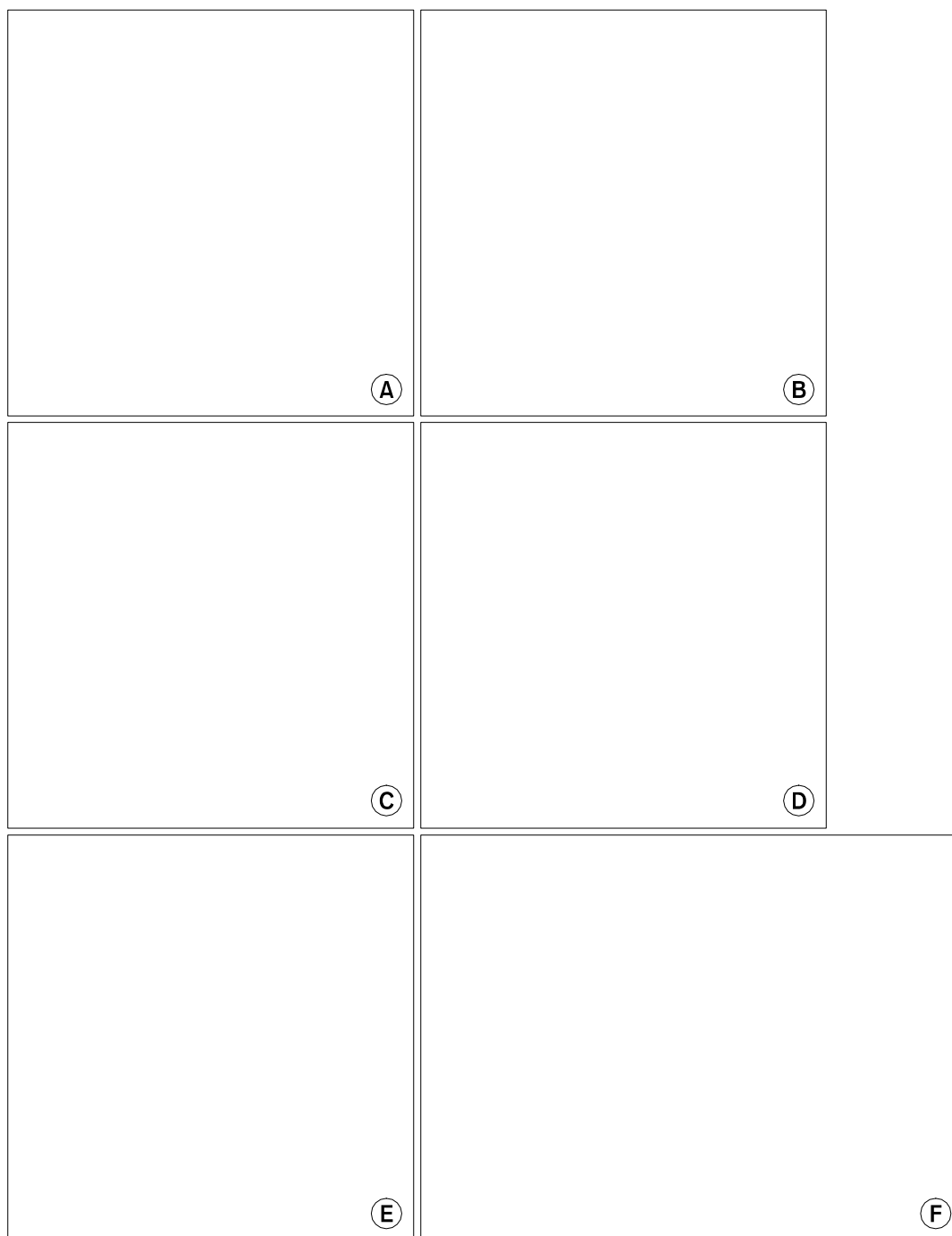


Fig. 2. A. A 0.8-cm depressed lesion in the sigmoid colon of a 64-year-old male patient. B. Dye spraying makes the depressed lesion clearer. C. At first, saline was injected into the submucosa beneath the lesion, and the lesion was raised upward. D. The lesion was ensnared and resected. E. Post-EMR state. F. Pathology showed a mucosal adenocarcinoma (H&E stain, $\times 100$).

The most common sites of delayed bleedings were the ascending colon and the sigmoid colon, showing 60% (Table 2A). The most common sizes ranged from 0.6 to 1.0 cm; the next most common sizes ranged from 1.1 to 2.0 cm. The configurations of the lesions which caused

delayed bleeding after a polypectomy showed an even distribution, except for laterally spreading tumors. This was because laterally spreading tumors are rare (Table 2B). As to treatment modality which caused delayed bleeding, a snare polypectomy was the most common,

Table 2B. Relationship between size and configuration of lesions removed by polypectomies

Size (cm)	Shape					Total
	Ip	Isp	Is	Ila	LST	
~0.5	0	2	3	2	-	7
0.6~1.0	3	2	4	2	-	11
1.1~2.0	3	4	1	0	1	9
2.1~3.0	2	0	0	0	0	2
3.1~	0	0	1	0	0	1
Total	8	8	9	4	1	30

Ip = pedunculated; Isp = semipedunculated; Is = sessile; Ila = flat-elevated; LST = laterally spreading tumor.

Table 2C. Distribution of treatment modality of polyps

Treatment	Number
Snare polypectomy	24
Piecemeal polypectomy	2
EPMR	1
Hot biopsy	3
Total	30

EPMR = endoscopic piecemeal mucosal resection.

amounting to 80%. It should be noted that hot biopsies caused delayed bleeding in 3 cases in this study (Table 2C). Regarding treatment of delayed bleeding, hemoclips, detachable snares, and epinephrine injections were mostly used in combination or alone (Table 2D). Most of the delayed bleeding occurred within the first postoperative week and most commonly on the first and the second postoperative days, accounting for 60% (Table 2E).

The perforation rate during diagnostic colonoscopy is reported as 0.03~0.65%.¹⁰ The perforation rate caused by therapeutic colonoscopy is reported as 0.073~2.14%.¹⁰ However, we experienced only one perforation among 12,927 polypectomies, showing a 0.007% perforation rate. That perforation occurred after an EMR for early cancer of the ascending colon, which was operated on after all. Some reports indicate that 52% of perforations occur during the procedure, 42% within 24 hours, and 6% within 48 hours.¹¹ Conditions in which conservative management is possible when perforation occurs are small-

Table 2D. Treatment of delayed bleeding after polypectomies

Treatment	Number
Hemoclip	6
Hemoclip+epi	17
Hemoclip+DS	5
Coagulation	1
Operation	1
Total	30

epi = epinephrine injection; DS = detachable snare.

Table 2E. Number of delayed bleeding patients on each postoperative day (POD)

POD	0	1	2	3	4	5	6	7	8	9	Total
Number	1	9	9	2	3	3	1	0	1	1	30

sized and silent asymptomatic perforation, adequate bowel prep state, scanty peritoneal soilage, and retroperitoneal perforation.^{10,12}

Conclusion

It is very hard to define a difficult polypectomy, but, in my opinion, a safe polypectomy would be the definition. On that point, large polyps and flat- or depressed-type lesions need to have special considerations. Besides, the basic principles and techniques of colonoscopy and polypectomy must be set forth beforehand. In this article, I have described those basic principles and techniques, and I have reported the results of my research on large polyps and complications.

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