

Correlation of the Morphology and Size of Colonic Polyps with Their Histology

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Background: Colonic adenomatous polyps are premalignant lesions; early recognition and use of a polypectomy for these polyps can reduce the occurrence of colorectal cancer. The purposes of this study were to evaluate the complications of polypectomy and the relationship between the morphology and size of colonic polyps and their histology.

Methods: Data on colonic polyps from 324 patients who received a polypectomy between April 1998 and December 2001 were collected. These included 207 men and 117 women, ranging in age between 17 and 86 years old, and who had had a colonoscopy or sigmoidoscopic examination. A polypectomy was performed on those colonic polyps discovered, and their morphology, size, and histology were analyzed.

Results: The histological findings of these polyps included adenoma, carcinoma, hyperplastic, and inflammatory polyps. One and a half percent ($n = 6$) were carcinomas, all of which belonged to the Yamada III or IV polyp group and were more than 1 cm in size, except for 1 polyp which was 0.7 cm. One case was complicated by colon perforation, and 2 cases experienced mild bleeding with no need for a blood transfusion or hospitalization.

Conclusions: Morphology and size are closely related to the malignant change in colonic polyps. Colonic polyps with a size greater than 1 cm and classified as Yamada type III or IV have a higher potential for malignant change, and a polypectomy should be considered when they are discovered. A polypectomy is a safe procedure with only minor complications.
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Key words: colon polyp, polypectomy.

The incidence of colorectal cancer has increased in recent years. Most studies support adenomatous colonic polyps being considered precursors to the development of colorectal cancer.⁽¹⁾ The size of the polyps was shown to be closely related to malignant change, but invasive cancer was found even in

polyps that were less than 1 cm.⁽²⁾ Although up to 2/3 of colorectal carcinomas might have developed from adenomatous polyps, the flat or depressed lesion also plays an important role.^(3,4) Therefore, early recognition of these lesions and a colonoscopic or sigmoidoscopic polypectomy are mandatory, but

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its safety is also a matter of concern. Some studies have reported that the rate of complications for polypectomies ranged from 0.3% to 6.1%, which included hemorrhage or colon perforation.⁽⁵⁻⁸⁾ The purposes of this retrospective study were to evaluate the relationship between morphology and size of colonic polyps and their histology, and the safety of performing polypectomies by colonoscopy or sigmoidoscopy.

METHODS

Three hundred and twenty-four patients who had received a polypectomy for colonic polyps between April 1998 and December 2001 were retrospectively analyzed. The ages ranged from 17 to 86 years old. In total, 400 colonic polyps were resected either by snare polypectomy or biopsy forceps for smaller polyps. After the patients were well prepared with polyethylene glycol or magnesium citrate, the endoscope was introduced up to the cecum when performing a colonoscopy or 60 cm from the anal verge if a sigmoidoscopic examination was arranged. Once the polyps were found, they were removed by any 1 of the methods mentioned above. The retrieved polyps were sent to a pathologist for size measurement and histological review. Macroscopic appearances of the polyps were categorized according to the Yamada classification.⁽⁹⁾

Table 2. Histological Finding of 400 Polyps

Morphology	Size (cm)	Histological findings			
		Adenoma	Carcinoma	Hyperplastic	Other
Y-I	≤ 0.5	25	0	7	9
	0.6-1.0	0	0	0	0
	1.1-2.0	0	0	0	0
	2.1-3.0	0	0	0	0
Y-II	≤ 0.5	53	0	7	6
	0.6-1.0	8	0	3	2
	1.1-2.0	1	0	1	0
	2.1-3.0	0	0	0	0
Y-III	≤ 0.5	53	0	12	8
	0.6-1.0	38	1	5	5
	1.1-2.0	10	0	0	3
	2.1-3.0	0	0	0	0
Y-IV	≤ 0.5	19	0	4	7
	0.6-1.0	48	0	3	7
	1.1-2.0	35	4	2	6
	2.1-3.0	5	1	0	2
Total		295 (73.7%)	6 (1.5%)	44 (11.0%)	55 (13.8%)

RESULTS

Altogether, we identified a total of 400 polyps in 324 patients. The indications for colonoscopy or a sigmoidoscopic examination included hematochezia (22.5%), diarrhea (21.3%), abdominal pain (20.0%), constipation (13.8%), and other less common indications such as tenesmus, a colonic polyp history, small-caliber stool, or positive fecal occult blood (Table 1). Two hundred seventy-nine patients had a single lesion, while 28 patients had 2 lesions, and 17 patients had 3 or more lesions. The histological findings of these polyps included adenomas (73.7%), hyperplastic polyps (11.0%), carcinomas (1.5%), and others (13.8%) such as inflammation, granulation tis-

Table 1. Indications for Colonoscopy or Sigmoidoscopy Examinations

Examinations	No. of patients (%)
Hematochezia	73 (22.5%)
Diarrhea	69 (21.3%)
Abdominal pain	65 (20.0%)
Constipation	45 (13.8%)
Tenesmus	23 (7.0%)
Colonic polyp history	19 (5.8%)
Screening colonoscopy	10 (3.0%)
Small caliber stool	9 (2.7%)
Positive fecal occult blood	9 (2.7%)
Bowel habit change	2 (0.6%)
Total	324

Table 3. Characteristics of 6 Colorectal Cancers

Case	Age/gender	Morphology	Size (cm)	Pathology
1	66/F	Y-III	0.7	Adenocarcinoma Duke A1
2	69/F	Y-IV	2.1	Adenocarcinoma Duke A1
3	56/M	Y-IV	1.3	VA + CIS
4	60/F	Y-IV	1.1	TV + CIS
5	65/M	Y-IV	1.8	TV + CIS
6	43/M	Y-IV	1.8	Adenomatous polyp + CIS

VA: villous adenoma; TV: tubulovillous adenoma; CIS: carcinoma in situ.

Table 4. Complications of Polypectomy

Case	Age/gender	Morphology	Size (cm)	Pathology	Complication
1	71/M	Y-III	0.4	TA	Bleeding
2	60/M	Y-IV	1.1	TA	Bleeding
3	58/M	Y-III	1.2	TA	Perforation

TA: tubular adenoma.

sue, retention polyps, lipomas, juvenile polyps, and so forth (Table 2). Morphologically, the polyps could be categorized into Yamada types I to IV, that is 10.2% (41/400) were type I, 20.2% (81/400) were type II, 33.7% (135/400) were type III, and 35.7% (143/400) were type IV. Six cases of carcinoma were identified, of which 5 were Yamada type IV polyps with a size greater than 1 cm, and the other was a 0.7-cm polyp belonging to the Yamada type III group. Four of these malignant polyps had irregular surfaces, while 2 showed a smooth reddish head when viewed macroscopically by colonoscopy or sigmoidoscopy (Table 3).

One patient was complicated by colon perforation after a polypectomy for a 1.2-cm Yamada type III polyp which was later identified as being a tubular adenoma by a pathologist. Two other cases had mild bleeding after the polypectomy, but neither blood transfusion nor hospitalization was needed (Table 4).

DISCUSSION

Most studies support adenomatous polyps being neoplastic precursors of colorectal cancers.^(1,10) An analysis of 7000 polyps by Shinya revealed that 2.8%, 8.4%, and 9.5% of tubular adenomas, tubulovillous adenomas, and villous adenomas contained malignant cells, respectively, which implied that colon cancerous change was directly proportional to the presence of a villous component.^(2,11)

In our series, all 6 cases of cancer belonged to Yamada III or IV type, and there were no malignancies for Yamada I or II polyps. More than 95% (120/122) of polyps of Yamada types I and II were less than 1 cm in size. Apparently, size plays a very important role in predicting malignancy. Atkin et al. stated that a polyp size of 1 cm or greater had a significantly increased risk (relative risk of 3.3) of developing subsequent colorectal cancer; but those with polyps less than 1 cm did not have an increased risk of cancer.⁽¹²⁾ Larger polyps tend to have a greater villous component and are more likely to harbor foci of carcinoma.

Carcinomas are histologically detected in 0.1% of polyps measuring less than 0.5 cm in diameter; this increases to 1.0% with 1-cm-diameter polyps and reaches 40% with polyps exceeding 2 cm.^(13,14) In our study, no cancer was found in polyps of less than 0.5 cm. Only 1 polyp, 0.8% (1/120), between 0.6 and 1.0 cm contained a malignancy. The rate of malignancy increased to 7.1% (5/70) for polyps greater than 1 cm. This may imply that the risk of malignant change in polyps of less than 1 cm is very low; a polypectomy for those polyps may not be necessary, and thus the cost and complication rate of polypectomies can also be reduced. Hofstad claimed that leaving polyps up to 1 cm in diameter may be considered safe, in terms of avoiding development of invasive carcinomas, provided that annual endoscopic follow-up examinations are carried out.^(15,16) Allan et al. removed a total of 1964 diminutive polyps (\leq

0.5 cm in diameter), of which 40.7% were adenomatous and only 0.26% contained atypical cells. This further supports the chances of diminutive polyps being cancerous or containing atypical cells being very low, and that removal is not necessary for these smaller polyps.^(17,18)

However, in our daily practice, we eradicate all polyps even if they are less than 1 cm to prevent adenomatous polyps from progressing to malignant transformation. Rembacken et al. reported that 63% of their lesions were polypoid, the remaining 37% were flat and depressed lesions. The overall risk of a polypoid lesion containing early cancer was 8% (17/204) compared with 14% (17/119) for flat lesions.⁽³⁾ No flat lesion was discovered in our study. The possible reasons were poor preparation of the colon, and less frequent use of dye sprays. Forty-four lesions were hyperplastic polyps and were smaller lesions; some reports still reveal that dysplasia also coexists with hyperplastic polyps.^(19,20)

The reported overall complication rate after a polypectomy ranges from 0.2% to 6.1%. The most common complication is bleeding, followed by transmural burn, perforation, and snare entrapment.^(5-8,21,22) The incidence of complications in colonoscopic polypectomies in this series was 0.7% (3/400). Two cases were complicated by mild bleeding which improved after conservative treatment without necessity for a blood transfusion.

One perforation occurred after a polypectomy was performed for a 1.2-cm polyp which belonged to Yamada type III and was located on the descending colon. Lack of experience may have been the main cause for this. Therefore, we suggest that supervision by a senior endoscopist is mandatory when performing an endoscopic polypectomy. In conclusion, polyps greater than 1 cm and belonging to Yamada type III or IV have a higher potential for malignant change, and resection should be considered. A polypectomy is a safe procedure despite minor complications.

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大腸瘰肉之形態、大小與組織學的相關性

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背景： 大腸腺性瘰肉為大腸癌之前驅物，如果早期發現並接受大腸鏡或乙狀結腸鏡切除將會減少大腸癌的發生。此研究之目的是藉由本院瘰肉切除術的案例分析來評估大腸瘰肉之大小，形態與組織學的相關性。

方法： 從1998年4月至2001年12月間，本院共有324位病人接受乙狀結腸或大腸鏡之瘰肉切除術。一共有207位男性，117位女性，年齡從17-86歲。所切除的瘰肉總共有400例。瘰肉的大小與組織學診斷是以病理科報告為依據。瘰肉的型態則是依Yamada分類法。

結果： 在本研究中，大腸瘰肉之組織學包括腺性瘰肉，大腸癌，增生性瘰肉及發炎性瘰肉等。有1.5% (6/324) 是大腸癌，這6例大腸癌全都屬於Yamada第三或四型。其中有5例是大於1公分，另外一例之大小則是0.7公分。其併發症主要有大腸出血0.6% (2/324)，及腸破裂0.3% (1/324)。

結論： 我們發現瘰肉之大小，形態與它的癌化有密切的關係，對於大於1公分的瘰肉及Yamada第三或四型者則有更大潛力轉變為癌症，所以應該積極給予切除。瘰肉切除術的併發症很低。因此，我們認為瘰肉切除其實是很安全的。
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關鍵字： 大腸瘰肉，瘰肉切除術。

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