More Effective Endoscopic Resection with a Two-Channel Colonoscope for Carcinoid Tumors of the Rectum

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PURPOSE: Complete resection of small carcinoid tumors of the rectum is difficult with conventional polypectomy, because these tumors are most often located in the submucosal layer of the rectal wall. To completely remove these tumors, we used a two-channel videocolonoscope with which both a grasping forceps and a polypectomy snare could be used simultaneously. We evaluated its clinical usefulness in comparison with one-channel colonoscopic polypectomy. METHODS: At Osaka Medical Center for Cancer and Cardiovascular Diseases, seven carcinoid tumors in seven patients were removed with a one-channel videocolonoscope from 1985 to 1992. In 1993 and 1994, ten tumors in nine patients were removed with a two-channel colonoscope. RESULTS: The rate of complete removal of carcinoid tumors with a two-channel videocolonoscope (9 of 10 tumors, 90 percent) was significantly higher ($P < 0.05$) than with a one-channel videocolonoscope (2 of 7 tumors, 29 percent). No complications occurred during or after endoscopic resection with a two-channel colonoscope. CONCLUSIONS: Endoscopic resection with a two-channel colonoscope is a useful and safe method for resection of small carcinoid tumors of the rectum. [Key words: Carcinoid tumor; Rectum; Two-channel colonoscope; Colonoscopic resection; Surgical technique]

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Recent advances in colonoscopy have made it easier to detect carcinoid tumors of the rectum at an early stage.[1] Rectal carcinoid tumors less than 1 cm in size and confined to the submucosal layer can be successfully treated with local endoscopic resection.[2] However, the risk of incomplete removal is very high.[1, 3] This suggests the need for further improvement of the endoscopic technique.

A new two-channel videocolonoscope was developed in 1993.[4] Because this colonoscope has two instrument channels, both a grasping forceps and a polypectomy snare can be inserted into the intestinal lumen simultaneously, enabling carcinoid tumors to be pulled toward the center of the lumen and excised by electrocoagulation. Therefore, in the present work, we evaluated the clinical usefulness of this two-channel colonoscope for removing small carcinoid tumors of the rectum.

TECHNIQUE

The two-channel videocolonoscope (CF-2T200™, Olympus, Tokyo, Japan) has two instrument channels; the diameters of these right and left channels are 3.2 and 2.8 mm, respectively. Colonoscopic resection with a two-channel videoscope was performed according to the method of Cho *et al.*[4] Briefly, under colonoscopic control and through the two instrument channels, a grasping forceps and a diathermic snare were inserted into the rectal lumen. The tumor was grasped and pulled toward the center of the lumen as far as possible by the grasping forceps, which had been passed through the snare loop. The snare was then placed around the base of the tumor and tightened to excise the tumor by electrocoagulation.

From 1985 to 1992, we used a conventional videocolonoscope with one instrument channel (CF-200™, Olympus) for endoscopic resection of seven carcinoid tumors in seven patients. In 1993, we began using a two-channel videocolonoscope. We have since used this colonoscope to resect ten carcinoid tumors in nine patients.

RESULTS

Histologic examination of specimens resected with a one-channel colonoscope showed that only two of

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Table 1.
Rate of Complete Resection of Rectal Carcinoid Tumors in Relation to Size and Form

Features of Tumors	Treatment with One-Channel Scope		Treatment with Two-Channel Scope	
	No. of Tumors	No. of Tumors Completely Resected	No. of Tumors	No. of Tumors Completely Resected
Size (%)				
Less than 5 mm	0	0	3	2 (67)
5–10 mm	7	2 (29)	7	7 (100)*
Form (%)				
Semipedunculated	2	1 (50)	2	2 (100)
Sessile	5	1 (20)	8	7 (88)
Total	7	2 (29)	10	9 (90)†

Significantly different from the value for treatment with one-channel colonoscope (Fisher's exact probability test).
* $P < 0.02$.
† $P < 0.05$.

seven tumors (29 percent) were resected completely (Table 1). However, a two-channel colonoscope achieved a significantly higher complete resection rate; nine of ten tumors (90 percent, $P < 0.05$) were resected completely. The only tumor that could not be resected completely with a two-channel colonoscope was in the first patient of the treatment group. Complete resection rate of large tumors (5 to 10 mm in diameter) was significantly higher with a two-channel colonoscope than with a one-channel colonoscope (100 *vs.* 29 percent; $P < 0.02$) and that of sessile tumors tended to be higher (88 *vs.* 20 percent).

Of five patients in whom carcinoid tumors could not be resected completely with a one-channel colonoscope, one later underwent laparotomy. Histologic examination of resected specimens revealed no evidence of residual tumor cells. The other four patients were followed-up with endoscopic examinations, but no recurrence was detected during the observation period (mean, 4.3 years; range, 7 months to 7 years).

One patient in whom a tumor could not be resected completely by a two-channel colonoscope was followed-up with endoscopic examinations, but no recurrence was detected in the eight months after endoscopic treatment. In patients in whom tumors were resected completely, no recurrence was found during the observation period (mean, 2.5 years).

DISCUSSION

Rectal carcinoid tumors smaller than 1 cm can be successfully treated with local excision, such as that by endoscope, because they rarely metastasize.[5] However, complete resection is very difficult with conventional polypectomy. Previously, we[1] reported that carcinoid tumor cells were near to or exposed at the resected margin in all eight patients with rectal carcinoid tumors less than 1.5 cm in diameter who were treated with conventional polypectomy. These findings suggest that more effective endoscopic resection techniques are needed.[3]

In the present study, we used a newly developed two-channel videocolonoscope to treat small carcinoid tumors of the rectum. This scope has two instrument channels with which both a grasping forceps and a polypectomy snare can be used simultaneously. Therefore, the tumor can be pulled toward the center of the rectal lumen and excised with electrocoagulation. We found that the complete resection rate was significantly higher with a two-channel videocolonoscope (90 percent) than with a conventional one-channel videocolonoscope (29 percent). Neither bleeding nor perforation occurred during or after treatment. Therefore, we conclude that endoscopic resection with a two-channel videocolonoscope is an easy and useful method for treatment of small carcinoid tumors of the rectum.

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