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The Problem of *De Novo* Colorectal Carcinoma

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From April 1985 to March 1995, colonoscopy was carried out at our institution in 24 059 patients, 31 800 times in symptomatic and/or asymptomatic average risk persons. 184 submucosal invasive carcinomas were detected. Unlike protruding-type lesion, the depressed-type invades the submucosal layer, even though the size is within 10 mm. The depressed type of invasive carcinoma accounted for 20 lesions, and represented 10.9% (20 of 184) of all the invasive carcinomas. The pit pattern of depressed-type lesions shows a small round pit (type III_s pit pattern) and that of carcinoma lesions shows the irregular pit and non-structure (type V pit pattern).

Key words: depressed-type early colorectal carcinoma, pit pattern, magnifying videoscope, *de novo* carcinoma, lateral spreading tumour (LST)

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INTRODUCTION

THE CONCEPT of “adenoma–carcinoma sequence”, that is, colorectal carcinoma occurs from a polyp, is widely accepted. However, we have detected many depressed-type early colorectal carcinomas [1]. These were seldom reported until 1986 [2]. The gross configuration of the depressed type early colorectal carcinoma is completely different from that of the protruding-type lesion. To detect the depressed type of colorectal tumour, it is important to pay special attention to slight changes in the mucosal colour during endoscopy. Unlike the protruding-type lesion, the depressed-type lesion invades the submucosal layer, even though its size is under 10 mm [2]. Because of this, we consider the depressed-type *de novo* carcinoma to be another route in the developmental process of colorectal carcinoma.

PATIENTS AND METHODS

From April 1985 to March 1995, colonoscopy was carried out at our institution in 24 059 patients, 31 800 times (total colonoscopy, $n = 23\,603$; sigmoidoscopy, $n = 8197$) in symptomatic and/or asymptomatic average risk persons. We detected 7397 cases of colorectal tumours (adenoma and early cancer) and treated 7173 cases endoscopically using hot biopsy ($n = 1800$), polypectomy ($n = 3847$), and EMR (endoscopic mucosal resection) ($n = 1526$). Laparotomy was used in 219 cases while laparoscopic-assisted colectomy was carried out in 5 cases of early colon cancer. Histological diagnoses were determined according to the World Health Organisation (WHO) criteria [3].

The magnifying videoscope (CF200Z, Olympus) has been used since 1990. Magnifying endoscopic observation was conducted as outlined below. After lesion detection via ordinary observation, 0.4% indigo carmine is sprayed (contrast method). Furthermore, for closer evaluation resembling stereomicroscopic evaluation, 0.2% cresyl violet staining is used, together with magnified observation.

RESULTS

Submucosal invasive rate of depressed-type carcinoma

We detected 7397 cases of colorectal tumours (adenoma and early cancer), of which 184 cases were submucosal invasive carcinomas. The depressed-type submucosal invasive carcinoma accounted for 20 lesions, and represented 10.9% (20 of 184) of all the invasive carcinomas (Table 1). The submucosal invasive carcinoma incidence seen for each gross configuration were 14.5% in the depressed-type, 11.6% in the lateral spreading tumour (LST), 2.4% in the protruded-type, and 1.4% in the superficial elevated type. In the depressed-type, the submucosal invasive incidence was 39.1% in the lesions with a diameter of 6–10 mm, while the invasive incidence in the protruding and superficial elevated-types was 1.5% and 2.5%, respectively.

Pit pattern and histology

The pit pattern of depressed-type lesions shows a small round pit (type III_s pit pattern) which is smaller than the normal pit observed on the surface of normal mucosa (Figure 1) [2,4]. Carcinoma lesions usually show the irregular pit and non-structural (type V pit pattern), which we define as an amorphous sign (Figure 2). Regarding protruding-type lesions, these show tubular or branching pit (type III_L pit pattern) which is evidently differentiated from that of depressed-type lesions (Figure 3). The crypt of the small round pit (type III_s pit pattern) shows a straight structure and rapidly invades the submucosa. This pit is thought to be the bud of the *de novo* carcinoma gland [3].

Since 1990, we have observed the pit pattern in 70 cases of submucosal invasive carcinoma by magnifying videoscope. The type of pit patterns seen are type III_s pit pattern: 3 (4.3%); type III_L pit pattern: 4 (5.7%); type IV pit pattern: 28 (40%) and type V pit pattern: 35 (50%).

Development of colorectal carcinoma

The two pathways of the development of colorectal carcinoma are shown in Figure 4.

The depressed-type of tumour (type IIc) is thought to be a *de novo* carcinoma which invades the submucosal layer, even

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Table 1. Submucosal invasion rate of colorectal neoplastic lesions

Gross configuration	Size (mm)					Total	Submucosal invasion rate
	≤5	6–10	11–15	16–20	≥21		
Protruded I _p I _{ps} I _s	2273 (0)* 0.0%	1423 (21) 1.5%	367 (41) 11.2%	114 (24) 21.1%	55 (17) 30.9%	4232 (103)	2.4%
Superficial elevated II _a II _b II _a + II _c	2429 (2) 0.08%	354 (9) 2.5%	41 (15) 36.6%	12 (8) 66.7%	10 (6) 60.0%	2846 (40)	1.4%
Depressed II _c II _c + II _a	110 (9) 8.2%	23 (9) 39.1%	2 (2) 100%	0	3 (0) 0.0%	138 (20)	14.5%
LST*	—	30 (0) 0.0%	66 (0) 0.0%	26 (5) 19.2%	59 (16) 27.1%	181 (21)	11.6%
Total	4812 (11) 0.2%	1830 (39) 2.1%	476 (58) 12.2%	152 (37) 24.3%	127 (39) 30.7%	7397 (184)	2.5%

*Submucosal invading carcinoma. LST, Lateral spreading tumour.

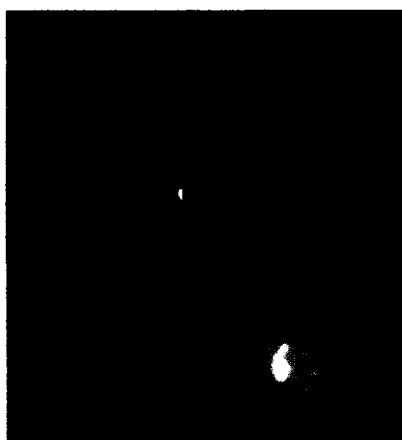


Figure 1. Magnified image after indigo carmine spraying showing type III_L pit.

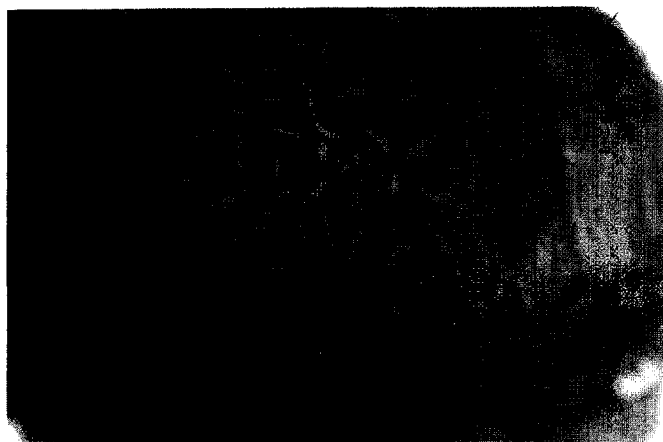


Figure 3. Stereomicroscopic image showing type III_L pit.



Figure 2. Stereomicroscopic image showing type V and type III_L pit, amorphous sign positive.

though its size is 5–10 mm [3, 6, 7]. If it deeply invades the submucosal layer, the depressed-type of tumour should change its shape of gross configuration to type II_a + II_c, and finally grow into the advanced cancer.

The superficial elevated-type lesions with shallow depression, which we called "II_a + dep", are thought to grow into type II_a tumours and then develop into protruding-type tumours, and finally develop into advanced cancer. Lateral spreading tumours (LST) are also thought to become advanced cancers after the tumour size has increased enough.

Endoscopic diagnosis of depressed-type lesions

Depressed-type lesions in general are recognised as a slight redness (Figure 5). The lesions become clearer using a contrast method (Figure 6). After that, the type III_L pit pattern of depressed lesion can be observed by magnifying endoscope (Figure 1).

Endoscopic treatment

Most depressed-type lesions invade the submucosal layer deeply if their size measures 10 mm or more. Furthermore, the depressed-type may invade the submucosal layer even if it is a minute lesion measuring 5 mm or less. For this reason, we should initially detect the small depressed lesion measuring

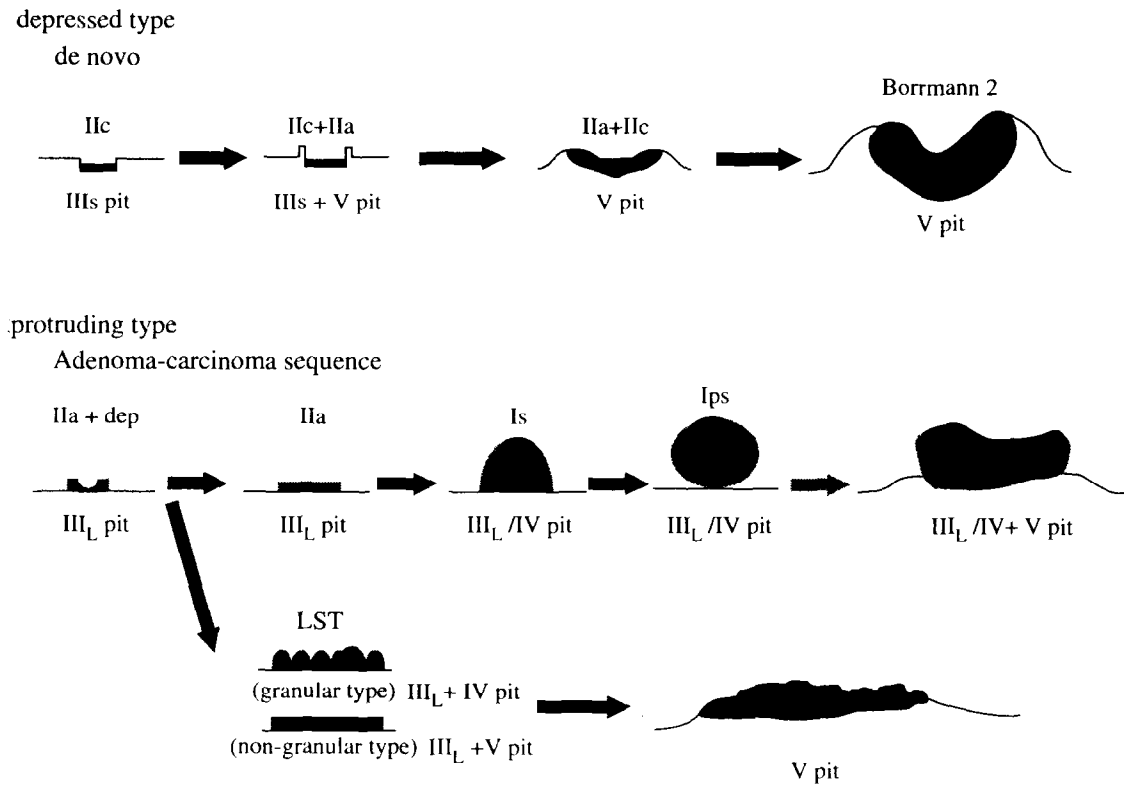


Figure 4. Development of colorectal cancer.



Figure 5. A normal endoscopic image showing a slight redness of depressed-type lesion.



Figure 6. Endoscopic image after indigo carmine spraying makes the depression clearer.

approximately 5 mm and endoscopic mucosal resection should follow [5].

CONCLUSION

Depressed-type carcinoma, which differs from the protruding-type, should be regarded as a *de novo* carcinoma. Clinically, the submucosal invasion ratio of the depressed-type was much higher than for the protruding-type of lesions. Furthermore, the depressed-type carcinoma usually invades the submucosal layer, even though its size is under 10 mm. Consequently, we should not overlook depressed-type lesions in our colonoscopic examination and resect the lesion endoscopically.

1. Kudo S, Tamura S, Nakajima T, *et al.* Depressed type of colorectal cancer. *Endoscopy* 1995, **27**, 54–57.
2. Kudo S, Muto T. Superficial depressed type (IIc) of colorectal carcinoma (in Japanese). *Gastroenterol Endosc* 1986, **28**, 2811–2813.
3. Kudo S, Hirota S, Nakajima T, *et al.* Colorectal tumours and pit pattern. *J Clin Path* 1994, **47**, 880–885.
4. Morson BC, Sobin LH. Histological typing of intestinal tumours. *Geneva: World Health Organisation*, 1976.
5. Kudo S. Endoscopic mucosal resection of depressed types of early colorectal cancer. *Endoscopy* 1993, **25**, 455–461.
6. Kuramoto S, Oohara T. Flat early carcinomas of the large intestine. *Cancer* 1989, **64**, 950–955.
7. Shimoda T, Ikegami M, Fujisaki J, *et al.* Early Colorectal Carcinoma with special reference to its development *de novo*. *Cancer* 1989, **64**, 1138–1146.