

Endoscopic Management of Colorectal T1(SM) Carcinoma

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 Springer

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Preface

At present, many T1 (SM) colorectal carcinomas have been diagnosed and treated by endoscopy or surgery. Also, it has been clarified that even for T1b (SM deep invasive) cancer, if there are no other lymph node metastatic risk factors such as unfavorable histologic components, vessel involvement, and a high budding grade, the estimated lymph node metastatic risk is 1.2–1.4%. On the other hand, recent progress in endoscopy such as endoscopic submucosal dissection (ESD) has made it possible to resect Tis/T1 colorectal cancer endoscopically en bloc regardless of its size. Endoscopic treatment is gradually becoming more commonly used to achieve excisional biopsy even for cT1b colorectal carcinoma like this.

Nevertheless, in order to generalize this practice, we must solve several issues. First, precise invasion depth diagnosis prior to endoscopic resection of the lesion in order to achieve complete en bloc resection is important. En bloc resection is essential to determine the precise histologic diagnosis for deciding curability. Second, generalization of the endoscopic resection technique (polypectomy, endoscopic mucosal resection (EMR), ESD) for en bloc resection is important. Third, adequate handling of the endoscopically resected specimen and precise histologic diagnosis are essential to determine curability. For endoscopic treatment of T1 (SM) colorectal carcinoma, generalization and quality control of these three points are not only important but essential.

Accordingly, the publication of this educational text has been planned to address the above-mentioned issues. We hope that this book will assist in daily clinical practice for treatment of T1 (SM) colorectal carcinoma.

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Part I
The Endoscopic Diagnosis of Colorectal
T1(SM) Carcinoma

Chapter 1

Conventional Colonoscopy Including Indigo Carmine Dye Spray



Yusuke Saitoh and Mikihiro Fujiya

Abstract With recent advances in endoscopic diagnostic and therapeutic technology, the preoperative endoscopic diagnosis of T1 (submucosal) carcinomas will become more important for determining whether detected T1 carcinoma can be cured by endoscopy alone (lesions with <1000 μm submucosal invasion) or should be treated by surgery (lesions with ≥ 1000 μm submucosal invasion). Useful conventional colonoscopic findings suggestive of polypoid-type T1b carcinomas are as follows: an expansion appearance, tumor stiffness or unevenness in the comprehensive view, coarse surface findings, converging folds toward the tumor, poor extension of the surrounding colonic wall, and stiffness or deformity of the colonic lumen. Similarly, useful conventional colonoscopic findings suggestive of flat and depressed-type T1b carcinomas are as follows: an expansion appearance, tumor stiffness or unevenness, protrusion in the depression surface, uneven depression surface, strong redness, converging folds toward the tumor, colonic wall deformity, stiffness of the colonic lumen, and table-like protrusion. If at least one of these colonoscopic findings is detected, then surgery should be considered. However, if none of these colonoscopic findings are detected, endoscopic resection (i.e., endoscopic polypectomy, endoscopic mucosal resection (EMR), and endoscopic submucosal dissection (ESD) depending on the lesion's shape and size) can be performed.

Keywords Colorectal T1 (SM) carcinoma · Conventional colonoscopy · Indigo carmine dye spray · Invasion depth diagnosis · Endoscopic mucosal resection · Endoscopic submucosal dissection

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1.1 Introduction

In recent years, the number of colorectal carcinoma cases has increased in Japan, and colorectal cancer was the third most common cause of cancer-related death in men and the most common cause in women from 2003 [1]. The early detection of colorectal carcinomas is expected to become an increasingly important issue for reducing the rate of colorectal cancer death, as the prognosis of early colorectal carcinomas is satisfactory, with a 5-year survival rate exceeding 90%, and a complete cure can be obtained by endoscopic resection and/or radical surgery [2].

Recent advances in the endoscopic diagnosis and treatment of colorectal carcinomas have been remarkable, with the increased detection of flat and depressed (F&D) tumors [3] and the use of magnifying endoscopy with narrow-band imaging (NBI) [4] and high-frequency ultrasound probes (HFUPs) [5] in the diagnostic aspect and the increasing use of endoscopic mucosal resection (EMR) [6] and endoscopic submucosal dissection (ESD) [7] for large F&D tumors in the therapeutic aspect.

Endoscopic treatment for early colorectal carcinomas allows for less invasive treatment, resulting in a good quality of life (QOL) for patients. However, this approach is indicated for lesions with little risk of lymph node metastasis, with surgery recommended as a radical treatment for T1 carcinomas on principle as approximately 10% of all T1 carcinomas have lymph node metastases [8].

The increase in the aging population is expected to result in an increase in the number of patients requiring follow-up after endoscope resection without additional surgery due to systemic complications, even if the resected lesion carried some risks of lymph node metastasis. A preoperative endoscopic diagnosis will therefore prove important for determining whether a detected lesion can be cured by endoscopy alone or if it should be considered to treat by radical surgery.

1.2 Indication of Endoscopic Resection for Colorectal Carcinomas

Endoscopic resection is basically indicated for colorectal lesions with little risk of lymph node metastasis, such as benign adenomas, intramucosal carcinomas (Tis) (corresponding to severe dysplasia in Western countries), and focally extended T1 (T1a) carcinomas.

According to the 2014 guidelines of the Japanese Society for Cancer of the Colon and Rectum (JSCCR) for the treatment of colorectal cancer [8], T1 carcinomas histologically diagnosed with a negative vertical margin and favorable histologic grade (papillary adenocarcinoma or tubular adenocarcinoma) with a submucosal invasion depth of $<1000\ \mu\text{m}$, no vascular permeation, and grade 1 tumor budding (low grade) can be followed up without additional surgery after endoscopic resection. By referencing the abovementioned histopathological findings, we can reduce the rate of unnecessary additional surgery.

However, the only one of these histopathological findings that can be assessed before endoscopic resection is the invasion depth. Therefore, determining preoperatively whether a detected lesion is a T1a carcinoma (submucosal invasion depth $<1000\ \mu\text{m}$) or T1b carcinoma (submucosal invasion depth $\geq 1000\ \mu\text{m}$) is of great importance with regard to the choice of therapy (endoscopic resection vs. surgery).

1.3 Conventional Colonoscopic Findings for Determining the Choice of Therapy (Submucosal Invasion Depth <1000 or $\geq 1000\ \mu\text{m}$)

It is important to discriminate between T1 carcinoma with a submucosal invasion depth of $<1000\ \mu\text{m}$ (T1a) that may be completely cured by endoscopic resection alone and that with a submucosal invasion depth of $\geq 1000\ \mu\text{m}$ (T1b) that should be considered to treat with surgery.

From a prospectively analysis [9], conventional colonoscopic findings including 0.1% indigo carmine dye spray without magnifying colonoscopy or HFUPs, which are useful for choosing the therapy, were described in each macroscopic type.

1.3.1 Conventional Colonoscopic Findings Suggestive of Polypoid-Type T1b Carcinoma

Useful conventional colonoscopic findings suggestive of polypoid-type T1b carcinomas are shown in Table 1.1. An expansion appearance (protrusion and overextension of the tumor and/or surrounding normal mucosa, like a submucosal tumor), tumor stiffness or unevenness in the comprehensive view, coarse surface findings (surface roughness) in the surface property, converging folds toward the tumor (two

Table 1.1 Conventional colonoscopic findings suggestive of polypoid type T1b ($\geq 1000\ \mu\text{m}$) carcinoma lesions

Univariate analyses with Mann-Whitney U			
Colonoscopic findings	<i>p</i> Value	Colonoscopic findings	<i>p</i> Value
Comprehensive view		Property of the tumor surroundings	
Expansion appearance	0.0369	Converging folds towards the tumor	0.0111
Tumor stiffness	0.0001	Deformity of the colonic lumen	0.0004
Tumor unevenness	0.0192	Poor extension of the surrounding colonic wall	0.0028
Surface property			
Coarse surface findings (surface roughness)	0.0235		

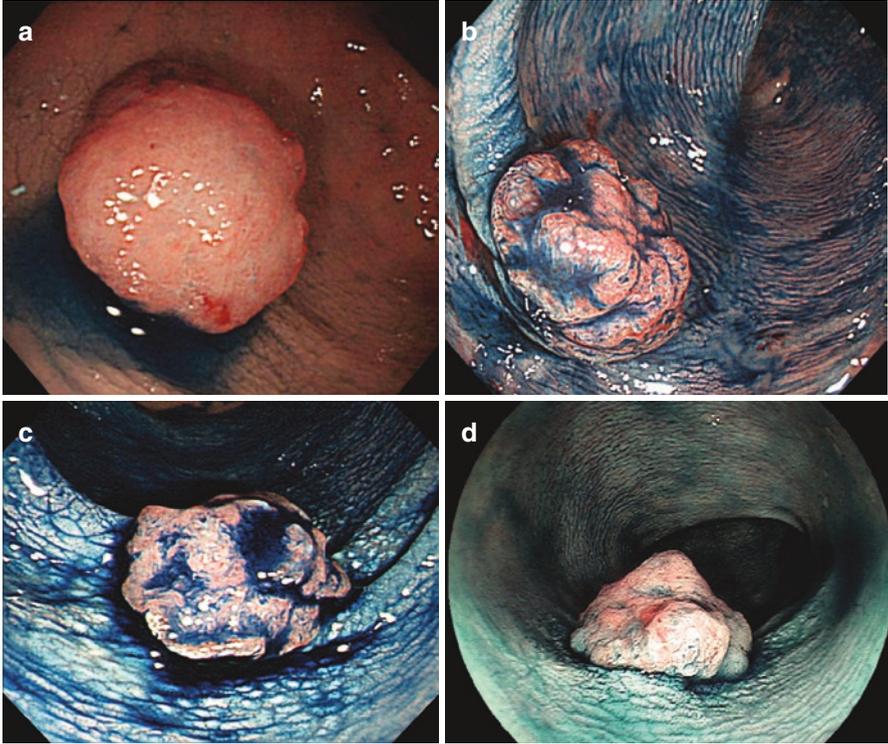


Fig. 1.1 Suggestive colonoscopic findings for polypoid-type T1b ($\geq 1000 \mu\text{m}$) carcinomas: (a) expansion appearance, (b) tumor stiffness, surface unevenness, (c, d) converging folds toward the tumor and stiffness of the colonic lumen

or more mucosal folds converging toward the tumor), poor extension of the surrounding colonic wall, and stiffness or deformity of the colonic lumen among properties of the tumor surroundings were observed with significantly high frequency in polypoid-type T1b carcinomas. Representative objective conventional colonoscopic findings are shown in Fig. 1.1.

1.3.2 Conventional Colonoscopic Findings Suggestive of F&D-Type T1b Carcinoma

Similarly, useful conventional colonoscopic findings suggestive of F&D-type T1b carcinomas are shown in Table 1.2. An expansion appearance, tumor stiffness or unevenness in the comprehensive view, protrusion in the depression surface, uneven depression surface, strong redness in the surface property, converging folds toward the tumor, colonic wall deformity, stiffness of the colonic lumen, table-like