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ORIGINAL ARTICLE

Synchronous pathologic findings in patients with colorectal cancer and preoperative incomplete colonoscopy

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Abstract

Background and purpose Guidelines recommend perioperative complete colonoscopy in patients with colorectal cancer (CRC) to reduce the risk of metachronous carcinoma. Our aim was to verify these recommendations by examining the residual colon of patients with incomplete preoperative colonoscopy.

Patients and methods This retrospective analysis included patients with the initial diagnosis of CRC and preoperative incomplete or no colonoscopy. Postoperative colonoscopies were investigated to identify synchronous lesions.

Results In two-thirds of the patients, synchronous lesions could be detected. In 78% of the cases, the lesion was located proximal of the endpoint of the initial colonoscopy and therefore undiscovered. Two-thirds of the synchronous lesions were adenomata.

Conclusions Complete perioperative colonoscopy in patients with CRC should be performed to reduce the rate of metachronous carcinoma. Postoperative completion of preoperative insufficiently colonoscoped patients is recommended.

Keywords Colorectal cancer · Colonoscopy · Synchronous lesions · Metachronous carcinoma

Introduction

Colonoscopy is the diagnostic gold standard for intraluminal assessments of the colon. It yields the highest sensitivity in the detection of neoplastic lesions, which can be removed simultaneously [1–3]. Quality and efficacy of colonoscopy rely on the completeness and accuracy of the procedure as displayed by the cecal intubation rate, as well as the adenoma detection rate [4, 5].

Numerous guidelines, such as the German Guideline for Colorectal Cancer, the European ESMO Consensus Guideline, or recommendations of the US Multi-Society Task Force on Colorectal Cancer, highlight the importance of a perioperative complete colonoscopy in patients with colorectal cancer (CRC): if colonoscopy cannot be accomplished prior to surgical treatment, it should be completed within 6 months after resection [6–8].

Several studies have shown that the risk of proximal neoplasia increases with the presence of distal lesions and that the incidence depends on the severity of the distal finding [9, 10]. In addition, the presence of synchronous neoplasms seems to be an independent risk factor for the development of metachronous pathologic findings, implying that those patients should receive more frequent follow-up colonoscopies [11–15].

Further information about the incidence and implication of synchronous neoplasms is still needed to customize surveillance strategies after curative CRC resection. Especially in patients with stenosing CRC, the incidence of synchronous polypoid lesions remains unknown.

The aim of this study was to shed light on the status of the residual colon in CRC patients with incomplete colonoscopy.

Patients and methods

In this retrospective analysis, all patients of a tertiary cancer center with the initial diagnosis of CRC between 2009 and 2017 were screened for preoperative incomplete colonoscopy. All patients who did not have a complete colonoscopy before surgery were included in the study.

We identified reasons for the incompleteness and examined the first follow-up colonoscopy after oncological resection within 12 months after surgical treatment.

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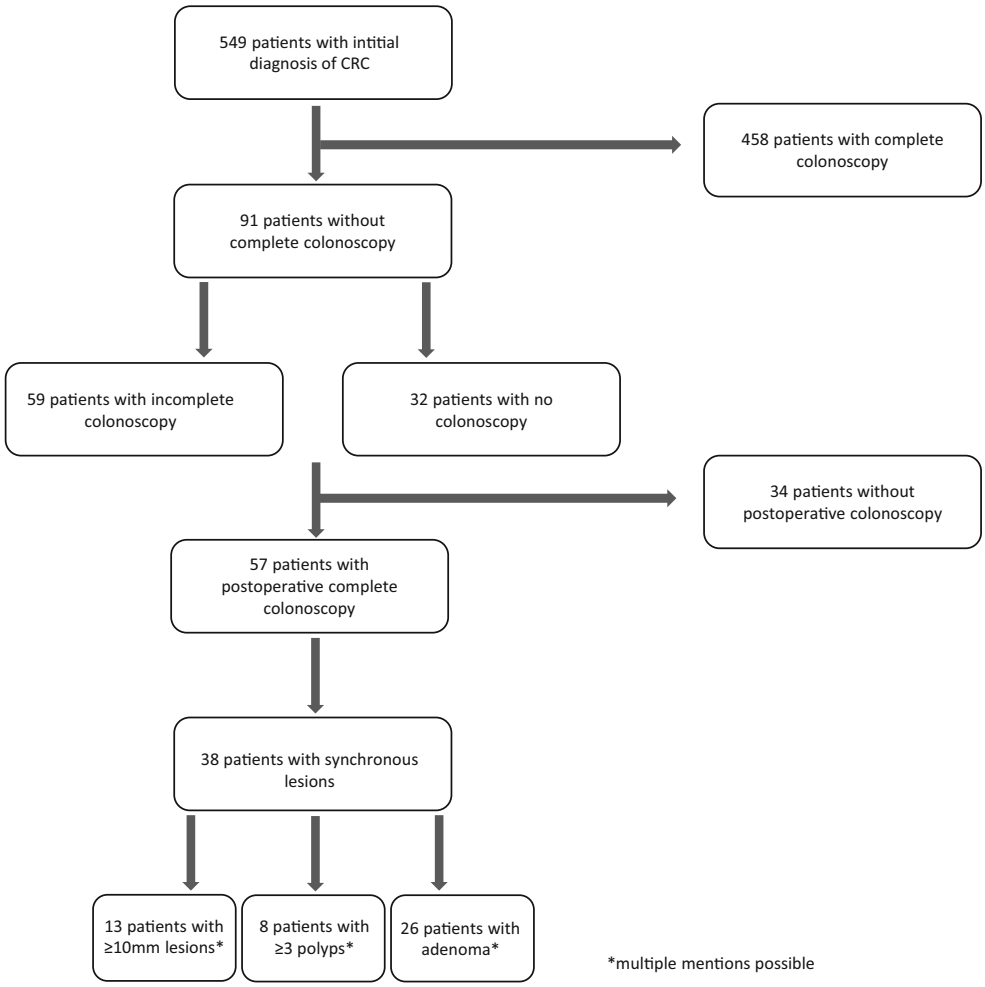

Fig. 1 Flowchart of patients enrolled in this study. CRC, colorectal cancer

We scanned colonoscopy reports for polyps of all size and morphology and focused on the question, how many lesions proximal of the initial endpoint were found and how many polyps sized at least 10 mm or multiple (≥ 3) polyps occurred.

Furthermore, histologic findings were examined to distinguish between hyperplastic polyps and neoplastic lesions.

The localization of polyps and primary cancer in patients with synchronous polyps was analyzed. For simplification, localizations were summarized in four categories: "ascending" for the cecum and ascending colon, "transverse" for both flexures and the transverse colon, "descending" for the descending colon, and "rectosigmoid" for the sigmoid and rectum.

Differences between groups were calculated using chi-square test. A p value < 0.05 was considered to be significant.

Results

Between the years 2009 and 2017, a total of 549 patients were primarily diagnosed with CRC in our hospital, of whom 91

Table 1 Characteristics of patients with the initial diagnosis of CRC without complete colonoscopy prior to surgical treatment. SD, standard deviation; No., number; UICC, Union Internationale contre le cancer; CRC, colorectal cancer

Characteristics	Total
Median age (in years ± SD)	69.5 ± 11.3
Age of female patients	71.2 ± 10.9
Age of male patients	67.4 ± 11.6
Gender (No. of patients (%))	
Male	41 (45%)
Female	50 (55%)
Tumor stage at initial diagnosis (No. of patients (%))	
UICC stage I	7 (7.7%)
UICC stage II	30 (33.0%)
UICC stage III	25 (27.5%)
UICC stage IV	29 (31.9%)
Primary CRC localization (No. of patients (%))	
Ascending	23 (25.3%)
Transverse	19 (20.9%)
Descending	6 (6.6%)
Rectosigmoid	43 (47.3%)

patients (16.6%) did not receive complete colonoscopy prior to surgical treatment (see Fig. 1).

Mean age of patients without complete colonoscopy was 69.5 years, 55% of them were female. The tumor stage at the time of initial diagnosis was mainly stage II or higher. Almost half of the tumors were located in or distal of the sigmoid, while nearly one-third was located in the right-sided colon (see Table 1).

Table 2 Preoperative, operative, and postoperative findings in patients with colorectal carcinoma and synchronous lesions without complete colonoscopy prior to tumor resection. No., number; CRC, colorectal cancer; UICC, Union Internationale contre le cancer; LGIEN, low-grade intraepithelial neoplasm; HGIEN, high-grade intraepithelial neoplasm, OAC, oral anticoagulant

Patient No.	Primary CRC location	UICC stage	Postoperative findings	
			Polyp size	Histology
1	Sigmoid	IIA	3 mm, 7 mm	LGIEN tubular adenoma
2	Transverse	IIIB	-	Hyperplastic polyp
3	Rectum	IIIB	12 mm	LGIEN tubulovillous adenoma
4	Sigmoid	IIIB	30 mm	HGIEN tubular adenoma
5	Sigmoid	IIIB	6 mm, 10 mm	Hyperplastic polyps
6	Rectum	IIIB	3 mm, 8 mm	LGIEN tubular adenoma
7	Rectum	IIA	-	Hyperplastic polyps
8	Rectum	I	-	-
9	Cecum	IIA	3 × 2 mm, 10 mm, 25 mm	Hyperplastic polyps, serrated adenoma, LGIEN tubular adenoma
10	Ascending	IV	4 mm	Granulation tissue
11	Sigmoid	IIA	-	1 × LGIEN tubular adenoma, hyperplastic polyps
12	Sigmoid	IIA	3 × 3 mm, 5 mm	LGIEN tubular adenoma
13	Sigmoid	IIA	7 mm	LGIEN tubular adenoma
14	Rectosigmoid	IIIB	3–7 mm	3 × LGIEN tubular adenoma, hyperplastic polyps
15	Transverse	IV	2 mm	Hyperplastic polyp
16	Ascending	IIIB	-	Recurrence CRC
17	Rectum	IIIB	-	Hyperplastic polyp
18	Sigmoid	IIA	-	Granulation tissue
19	Rectum	IV	25 mm, 4 mm	LGIEN tubulovillous adenoma
20	Rectum	IV	6 mm, 2 × 10 mm	3 × LGIEN tubular adenoma
21	Rectum	I		Ulcerative colitis
22	Descending	IIA	4 mm	LGIEN tubular adenoma
23	Rectum	IIIB	-	LGIEN tubular adenoma
24	Sigma	IIIB	-	Hyperplastic polyp
25	Cecum	IIIC	2 mm	LGIEN tubular adenoma
26	Transverse	IIA	9 mm, 5 mm	LGIEN tubular adenoma
27	Transverse	IIA	4-25 mm	7 × LGIEN tubular adenoma
28	Descending	IIA	-	LGIEN tubular adenoma
29	Transverse	I	6 mm, 4 mm	no resection due to OAC
30	Descending	IIIB	2–15 mm	8 × LGIEN tubular adenoma
31	Sigmoid	IV	-	2 × LGIEN tubular adenoma
32	Ascending	IIIB	-	LGIEN tubular adenoma
33	Rectosigmoid	I	6–25 mm	LGIEN tubular and tubulovillous adenoma, 1 × sessile serrated adenoma
34	Sigmoid	IIIB	12 mm	LGIEN tubular adenoma
35	Sigmoid	IV	10 mm	LGIEN tubular adenoma
36	Descending	IIA	20 mm	LGIEN tubular adenoma
37	Sigmoid	IIA	6–20 mm	LGIEN tubular adenoma
38	Sigmoid	IIA	5 mm, 9 mm	LGIEN tubular adenoma

In 59 patients, colonoscopy could not be completed. Reasons for incomplete colonoscopy were tumor stenosis (94.9%), poor bowel preparation (3.4%), or non-malignant stenoses (1.7%). Indeed, of all patients with unpassable tumors, 32% had UICC stage II and 3.5% had UICC stage I cancers, respectively. This may be explained by early malignant development in large, obstructive adenomata and/or high contact vulnerability. Thirty-two patients had no preoperative colonoscopy. In 26 patients, this was due to emergency surgery due to ileus or perforation, while the other patients had deviant initial tentative diagnoses.

Fifty-seven of these 91 patients underwent postoperative complete colonoscopy (62.6%), leaving 34 patients without postoperative colonoscopy. The main reasons why patients did not receive colonoscopy were advanced tumor stage (i.e., stage IV, 52.9%) and death within 6 months after surgery (23.5%).

In 38 of these 57 patients with postoperative colonoscopy, synchronous intraluminal lesions could be detected (66.7%). Table 2 displays the patient characteristics of all patients with synchronous findings.

In 31 of the 38 patients (81.6%) with synchronous findings, the detected lesion was either proximal of the endpoint of the prior incomplete colonoscopy or they did not have preoperative colonoscopy at all, thus, it could not have been detected in advance.

Thirteen patients (34.2%) had one or more polyps sized at least 10 mm and eight patients (21.5%) had multiple, i.e., at least three polyps. In 26 patients, adenomata could be detected (68.4%), including one high-grade tubular adenoma and one anastomotic recurrence of CRC. In eight patients, only hyperplastic polyps were detected; one patient had ulcerative colitis with pseudopolyps; in two patients, granulation polyps were found.

The localization of the primary cancer in patients who had synchronous pathologic findings was mainly the distal colon with 63% of the tumors located in the sigmoid or rectum, whereas 47% of all primarily diagnosed tumors were located in the rectosigmoid region (see Fig. 2). Chi-square test does not show a significant difference, though.

Of all adenomata, 39.5% were located in the cecum or ascending colon and 23.7% were located in the sigmoid or rectum (see Fig. 3). The distribution did not differ significantly.

Discussion

Endoscopic surveillance strategies after resection of CRC vary according to the state of the remaining colon. International guidelines recommend complete colonoscopy prior or within 6 months after curative resection. The amount, size, and histologic type of polypoid lesions detected during baseline colonoscopy determine the intensity of follow-up intervals.

In our study, we examined the colon of CRC patients, who did not receive complete colonoscopy prior to surgical treatment. This cohort had an advanced tumor stage and the vast majority had stenosing tumors. We found that two-thirds of the patients with the initial diagnosis of CRC had synchronous neoplastic lesions in the residual colon, and in 45.6% of patients with synchronous lesions, adenomata could be detected.

A study performing postoperative colonoscopy in patients with preoperative barium enema and low-stage tumor detected synchronous cancers in 2% and adenomata in 28%, respectively [16]. Other studies searched for postoperative metachronous lesions without consideration to the respective preoperative diagnosis. At 2 years of postoperative follow-up of 353 patients, colonoscopy revealed the presence of adenomata in 89 (25%) patients and CRC in 14 (3.9%) patients [17].

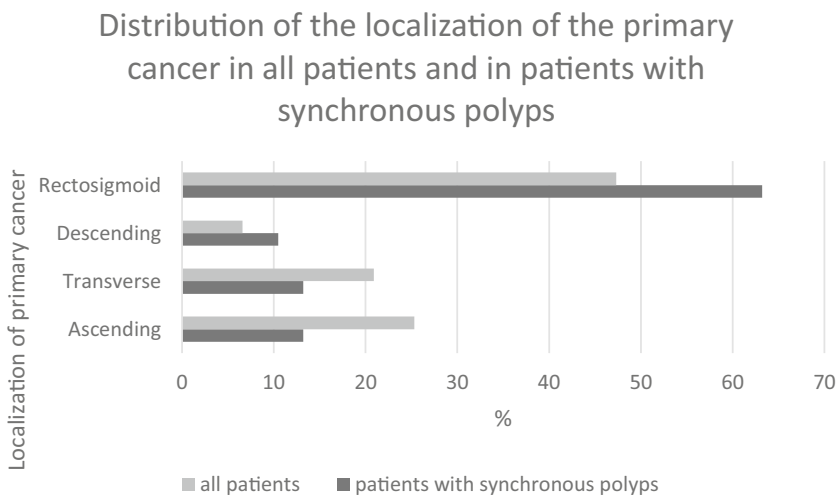

Fig. 2 Distribution of the localization of the primary cancer in all patients and in patients with synchronous polyps

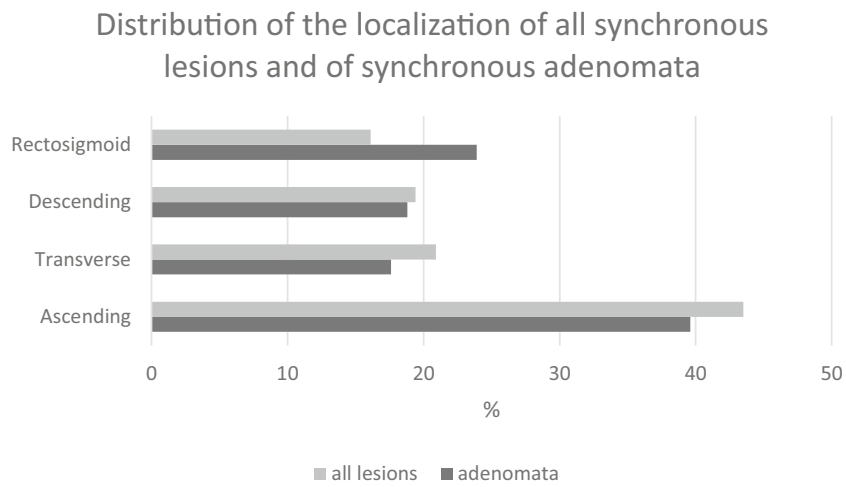

Fig. 3 Distribution of the localization of all synchronous lesions and of synchronous adenomata

In their meta-analysis, Doudou et al. found that the existence of distal lesions predicts proximal neoplasm and that the grade of malignancy of the polyps correlates with the incidence of proximal pathologic findings [18].

In our cohort, we found 81.6% of all synchronous polypoid lesions to be more proximal than the primary tumor. Forty percent of all adenomata detected in the postoperative colonoscopy were located in the cecum or ascending colon. However, in 63% of the patients with synchronous findings, the primary CRC was detected in the rectosigmoid, resulting in the resection of the distal colon.

Missed lesions are one of the main reasons for the development of interval or metachronous CRC [15]. Furthermore, the risk of developing metachronous lesions depends on the incidence of synchronous lesions [19]. Given the fact that four-fifth of the patients had synchronous neoplasms proximal of the primary tumor, it seems of importance to investigate the entire colon to avoid metachronous pathologies.

However, it still remains unclear, whether more intensive surveillance improves long-term outcome. Pita-Fernández et al. analyzed eleven studies of follow-up strategies with a total of > 4000 patients. There was a significant increase in overall survival in patients with more intense surveillance; however, no improvement in cancer-specific survival or an increased detection of total tumor recurrences could be found [20]. In their large retrospective study, Snyder et al. could not detect a significant correlation between surveillance intensity and the incidence of recurrence [21].

Conclusion

Postoperative complete colonoscopy in patients with incomplete colonoscopy prior to cancer resection shows a high number of residual synchronous neoplastic lesions. A considerable amount of adenomata could be detected in the proximal colon. Postoperative completion of preoperative insufficiently colonoscoped patients is recommended.

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