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Value of green sign and chicken skin aspects for detecting malignancy of colorectal neoplasia in a prospective characterization study.

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Abstract:

Background and study aim: Accurate endoscopic characterization of colorectal lesions is essential for predicting histology but is difficult even for experts. Simple criteria could help endoscopists to detect and predict malignancy. The aim of this study was to evaluate the value of the green sign and chicken skin aspects in the detection of malignant colorectal neoplasia.

Patients and methods: We prospectively characterized and evaluated the histology of all consecutive colorectal lesions detected during screening or referred for endoscopic resection (Pro-CONECCT study). We evaluated the diagnostic accuracy of the green sign and chicken skin aspects for the detection of superficial and deep invasive lesions.

Results: 461 patients with 803 colorectal lesions were included. The green sign had a negative predictive value of 89.6% [95% CI: 87.1-91.8%] and 98.1% [95% CI: 96.7-99.0%] for superficial and deep invasive lesions, respectively. In contrast to chicken skin, the green sign showed additional value for the detection of both lesion types compared with the CONECCT classification and chicken skin (adjusted OR for superficial lesions: 5.9 [95% CI: 3.4-10.2], p<0.001, adjusted OR for deep lesions: 9.0 [95% CI: 3.9-21.1], p<0.001).

Conclusions: The green sign may be associated with malignant colorectal neoplasia. Targeting these areas before precise analysis of the lesion could be a way of improving the detection of focal malignancies and the prediction of the most severe histology.

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ABBREVIATIONS

CONECCT: COlorectal Neoplasia Endoscopic Classification to Choose the Treatment

EID: Endoscopic Intermuscular Dissection

EMR: Endoscopic Mucosal Resection

ESD: Endoscopic Submucosal Dissection

LST: Laterally Spreading Tumor

OR: Odds ratio

VCE: Virtual Chromoendoscopy

INTRODUCTION

Accurate endoscopic characterization of colorectal lesions is essential to predict histology, but remains very difficult [1]. Lesions are characterized on the basis of real-time assessment of their macroscopic appearance, vascular and pit pattern with magnification, both in white light and virtual chromoendoscopy. All validated criteria have been previously grouped into a single table: the CONECCT (COlorectal Neoplasia Endoscopic Classification to Choose the Treatment) classification (**Figure 1**). This table significantly improves the histological prediction and therapeutic choice of French gastroenterologists on still images produced by experts [1–3], but the detection of the interest area needs to be improved. Indeed, characterization reveals considerable histological heterogeneity within the lesion, with malignancy often appearing in a focal zone within dysplastic lesions with completely different prognoses. This crucial zone must be detected to predict the most unfavorable histology and therefore to choose the right treatment [3]. Detection of these zones of interest is not easy, but they have the particularity of potentially having a different color, as previously described, with a green zone in virtual chromoendoscopy, creating a contrast with the color of the rest of the lesion [4] or with yellow-speckled mucosa in white light, surrounding the lesion, called chicken skin. Although chicken skin mucosa has been associated with advanced colorectal adenoma in previous studies, its histopathological mechanism remains unclear [5,6].

We conducted this study to assess the diagnostic accuracy of the presence of green sign [4] or chicken skin aspects [5,6] for the histological evaluation of consecutive colorectal lesions included in the prospective Pro-CONECCT trial characterizing all colorectal lesions detected or referred for endoscopic resection.

PATIENTS AND METHODS

Study Design

We conducted a prospective observational cohort study (Pro-CONECCT, NCT05983315) at our tertiary referral center in France, including patients who came for colonoscopy between September 2021 and February 2023, either for screening or for endoscopic resection of neoplastic lesions. During this period, all colorectal lesions detected during colonoscopies were characterized by experienced endoscopists and the CONECCT classification (**Figure 1**) was determined. All lesions were then completely resected to obtain their final histology. Our ethics committee approved this study, and all patients gave informed consent prior to the procedures.

Patients ≥ 18 years-old requiring diagnostic colonoscopy due to digestive symptoms, medical or family history of colorectal cancer or polyps, positive screening test, acromegaly, or referred to our center for colorectal lesion resection were included. We did not include patients with no colorectal lesion or no available histology, or a metastatic lesion diagnosed prior to colonoscopy, or a colorectal lesion previously resected by endoscopy, or presenting with adenomatous or sessile serrated polyposis syndrome, or suffering from inflammatory bowel disease. Patients with a submucosal lesion were excluded from the study.

Procedures

All colonoscopies were performed by eight senior endoscopists, with the patient under general anesthesia and using CO2 insufflation. Optical characterization of the lesions was performed using high-definition white light endoscopy followed by close-up examination assisted by virtual chromoendoscopy, with or without magnification, using Olympus CF-HQ190L/I colonoscopes (Olympus, Tokyo, Japan).

Histopathological examination was carried out by expert digestive pathologists according to the Vienna and TNM classifications [7,8].

Study objectives

The primary objective was the evaluation of the diagnostic accuracy of the green sign and chicken skin aspects for the detection of superficial lesions accessible to curative endoscopic treatment (low- and high-grade dysplastic adenoma, intramucosal adenocarcinoma, superficial submucosal adenocarcinoma with <1000 μm submucosal invasion) and deep invasive lesions requiring surgery (deep submucosal adenocarcinoma with >1000 μm submucosal invasion, intramuscular or deeper T2-T3 cancer).

The green sign was defined in virtual chromoendoscopy by a clearly delimited area of green color creating a spontaneous contrast with the color of other parts of the lesion whatever its size (**Figures 2,3**).

The chicken skin was defined in white light as an appearance of yellow-speckled mucosa surrounding the lesion (**Figures 2,3**).

The secondary endpoints were the evaluation of the overall severity of the histology of colorectal lesions with green sign or chicken skin compared with those without, with adjustment on the class of the CONECCT classification. A cross-assessment between green sign, chicken skin and the CONECCT classification was carried out.

Data collection

The data collected were patient demographics including sex and age at the time of colonoscopy; endoscopy indication and lesion characteristics: location, size, morphology, demarcation line, green sign, chicken skin mucosa and classification according to Paris, Kudo, Sano and CONECCT classifications.

Statistical analysis

Continuous variables were presented as mean ± standard deviation or as median with the first and the third quartile. Categorical variables were presented as numbers and percentages. Diagnostic accuracy was assessed by sensitivity, specificity, positive and negative predictive values, with the associated 95% confidence interval (95% CI). The analysis of the association between green sign/chicken sign on the severity of the histology was performed by ordinal logistic regression and quantified by an odds ratio with the associated 95% confidence interval (95% CI). Multivariable analyses were performed with adjustment on the CONECCT classification. Some patients had multiple lesions, but for diagnostic accuracy, lesions from the same patient can be considered independent. A p-value of less than 0.05 was considered significant. The analyses were performed using R software (version 4.1.2).

RESULTS

Characteristics of patients and colorectal lesions

We prospectively included 461 patients with 803 colorectal lesions: median age 70 years (range, 63-76); 252 men and 209 women (**Figure 4**). Patients and colorectal lesions characteristics are presented in **Table 1** and **Table 2**, respectively.

The green sign

In our cohort, 15.8% (127/803) of the colorectal lesions presented a green sign described by the endoscopists. After histological assessment, the green sign was described in none of the 56 hyperplastic lesions, in 1.0% (1/96) of sessile serrated lesions, in 8.6% (43/498) of low- or high-grade dysplastic adenomas, in 31.3% (26/83) of intramucosal adenocarcinomas, in 80% (8/10) of superficial submucosal adenocarcinomas (<1000um), in 75.6% (31/41) of deep submucosal adenocarcinomas (>1000 um) and in 94.7% (18/19) of intramuscular or deeper cancers (**Table 3**). The size of lesions with green sign was larger than those without, with large and small mean diameters of 45.02 mm (SD: 25.82) and 39.00 mm (22.18) respectively for lesions with green sign and 22.33 mm (25.62) and 20.05 mm (22.73) for lesions without. 33.3% (41/127) lesions with green sign and 3.2% (21/676) lesions without were pseudo-depressed non granular LST. 77.2% (98/127) lesions with green sign and 5% (34/676) lesions without had a demarcation line. 45.7% (58/127) lesions with green sign and 0.7% (5/676) lesions without were classified as Kudo Vn and 44.9% (57/127) lesions with green sign and 0.7% (5/676) lesions without as Sano IIIb.

Diagnostic accuracy of the green sign

The green sign had a negative predictive value of 89.6% [95% CI: 87.1-91.8%] and 98.1% [95% CI: 96.7-99.0%] for superficial and deep invasive lesions, respectively. The diagnostic accuracy, sensitivity, specificity, positive and negative predictive values of the green sign for the detection of superficial and deep invasive lesions are presented in **Table 4**.

Association with colorectal lesions' histology

The green sign had additional value for detecting superficial or deep lesions compared with CONECCT classification alone (adjusted odds ratio (OR) for superficial lesions: 7.1 [95% CI: 4.2-12.0], p<0.001, adjusted OR for deep lesions: 11.6 [95% CI: 5.3-26.0], p<0.001) as well as CONECCT classification and chicken skin (adjusted OR for superficial lesions: 5.9 [95% CI: 3.4-10.2], p<0.001, adjusted OR for deep lesions: 9.0 [95% CI: 3.9-21.1], p<0.001).

The chicken skin

In our study, 12.6% (101/803) of the colorectal lesions presented a chicken skin aspect. After histological assessment, the chicken skin was reported in none of the 56 hyperplastic lesions, in 2.1% (2/96) of sessile serrated lesions, in 10.2% (51/498) of low- or high-grade dysplastic adenomas, in 20.5% (17/83) of intramucosal adenocarcinomas, in 40.0% (4/10) of superficial submucosal adenocarcinomas (<1000um), in 39.0% (16/41) of deep submucosal adenocarcinomas (>1000 um) and in 57.9% (11/19) of intramuscular or deeper cancers (**Table 5**). The size of lesions with chicken skin was larger than those without, with large and small mean diameters of 36.03 mm (SD: 20.41) and 32.46 mm (19.16) respectively for lesions with chicken skin and 24.47 mm (27.46) and 21.70 mm (23.95) for lesions without.

Diagnostic accuracy of the chicken skin

The chicken skin had a negative predictive value of 85.0% [95% CI: 82.2-87.6%] for superficial and deep invasive lesions. The diagnostic accuracy, sensitivity, specificity, positive and negative predictive values of the chicken skin for the detection of superficial and deep invasive lesions are presented in **Table 4**.

Association with colorectal lesions' histology

The chicken skin had additional value for the detection of superficial or deep lesions compared with CONECCT classification alone (adjusted OR: 5.2 [95% CI: 3.3-8.0], p<0.001, and 7.5 [95% CI: 4.4-12.8], p<0.001, respectively). It also had additional value compared with CONECCT classification and green sign for the detection of superficial lesions (adjusted OR: 1.9 [95% CI: 1.0-

3.4], p= 0.036), but it was not possible to show additional value for deep lesions (adjusted OR: 2.1 [95% CI: 0.9-4.7], p=0.063).

DISCUSSION

To our knowledge, this is the first systematic description of the presence or absence of the green sign and chicken skin aspects, reporting that a green-colored area on virtual chromoendoscopy, or green sign, could be associated with a more pejorative histology of colorectal lesions, including after adjustment on the CONECCT classification and the chicken skin aspect. On the opposite, although associated with neoplastic polyps in a recent study [5,6], the chicken skin could not be associated with a more pejorative histology independently of CONECCT classification and green sign aspect. Although the green sign alone is not sufficiently reliable to affirm the presence of superficial lesions that can be treated endoscopically and deep invasive lesions requiring surgical treatment, the absence of green sign could be used to exclude the diagnosis of these lesions.

The accurate real-time characterization of colorectal lesions during endoscopy is crucial for histological prediction. After analyzing the macroscopic shape of the lesion by white-light imaging, the endoscopist should look for an existing area of degeneration, and then analyze these areas of interest in terms of vascular and mucosal relief. However, the malignant components can sometimes represent a small area of the whole lesion, hence relatively difficult to detect, especially for unexperienced endoscopists. Some aspects of the lesion, clearly identifiable during the analysis of the lesion, can help the endoscopist to identify these pejorative areas suspected of deep invasion. These are the demarcated, depressed, or even ulcerated areas or with spontaneous bleeding and the green sign could be part of these warning signs or red flags the endoscopist should look for. Furthermore, the green sign appears to be more easily detected on a distant view of the lesion, without the need to analyze the entire surface with magnification, which can be time-consuming. A further study of green sign detection in a population of gastroenterologists is needed to assess whether this sign could be detected by general gastroenterologists.

Although artificial intelligence is now very effective at detecting lesions [9], it still requires the human hand to show colorectal lesions and can sometimes be less effective at detecting flat lesions [10]. Furthermore, current development of computer-aided detection systems focuses on the

assessment of neoplastic versus non neoplastic lesions, and is not geared towards predicting invasion depth [9]. The development of systems dedicated to the detection of the green sign would be a valuable aid and would encourage gastroenterologists to examine this focal area.

Although chicken skin was described in 1998 as being due to macrophagic infiltration with xanthomatous morphology [5], we found this infiltration only very rarely (**Figure 5**). An increased number of lymphoid nodules visualized at the periphery of the invasive carcinoma and corresponding to a hyperplastic reaction of the gut associated lymphoid tissue could at least partially explain the chicken skin with regularly scattered small nodules lifting the mucosa. The green sign in chromoendoscopy is related to an increased hemoglobin signal in the invasive zone [11]. The increased signal may be due to the increased visibility of submucosal blood flow, which may be explained on the one hand by the thinning of the mucosa compared to the adenomatous mucosa, as the invasive glands destroy the mucosa. On the other hand, the destruction of the muscularis mucosae by invasive glands could contribute to the increase in the hemoglobin detection signal as well, resulting in the green sign.

The main limitation of this study is due to its single endoscope brand design and its single tertiary center design which may not exactly reflect the lesions found in other centers. Green sign detection may be less effective in less experienced centers.

In conclusion, the green sign is associated with a more pejorative histology of colorectal lesions, irrespective of CONECCT classification and chicken skin aspect. Targeting these areas before precisely analyzing the lesion could be a way to improve detection for inexperienced endoscopists and avoid missing malignancies in colorectal neoplasia.

REFERENCES

[1] Fabritius M, Gonzalez J-M, Becq A, et al. A simplified table using validated diagnostic criteria is effective to improve characterization of colorectal polyps: the CONECCT teaching program. Endosc Int Open 2019; 07: E1197–E1206. doi:10.1055/a-0962-9737

[2] Bonniaud P, Jacques J, Lambin T, et al. Endoscopic characterization of colorectal neoplasia with different published classifications: comparative study involving CONECCT classification. Endosc Int Open 2022; 10: E145–E153. doi:10.1055/a-1613-5328

[3] Brule C, Pioche M, Albouys J, et al. The COlorectal NEoplasia Endoscopic Classification to Choose the Treatment classification for identification of large laterally spreading lesions lacking submucosal carcinomas: A prospective study of 663 lesions. United European Gastroenterol J 2022; 10: 80–92. doi:10.1002/ueg2.12194

[4] Lafeuille P, Fenouil T, Bartoli A, et al. Green-colored areas in laterally spreading tumors on narrow-band imaging: a future target for artificial-intelligence-assisted detection of malignancies? Endoscopy 2021; doi:10.1055/a-1488-6297

[5] Shatz BA, Weinstock LB, Thyssen EP, et al. Colonic chicken skin mucosa: an endoscopic and histological abnormality adjacent to colonic neoplasms. Am J Gastroenterol 1998; 93: 623–627. doi:10.1111/j.1572-0241.1998.177_b.x

[6] Lee YM, Song KH, Koo HS, et al. Colonic Chicken Skin Mucosa Surrounding Colon Polyps Is an Endoscopic Predictive Marker for Colonic Neoplastic Polyps. Gut Liver 2022; 16: 754–763. doi:10.5009/gnl210271

[7] Ueno H, Mochizuki H, Hashiguchi Y, et al. Risk factors for an adverse outcome in early invasive colorectal carcinoma. Gastroenterology 2004; 127: 385–394. doi:10.1053/j.gastro.2004.04.022

[8] Hashiguchi Y, Muro K, Saito Y, et al. Japanese Society for Cancer of the Colon and Rectum (JSCCR) guidelines 2019 for the treatment of colorectal cancer. Int J Clin Oncol 2020; 25: 1–42. doi:10.1007/s10147-019-01485-z

[9] Hassan C, Spadaccini M, Iannone A, et al. Performance of artificial intelligence in colonoscopy for adenoma and polyp detection: a systematic review and meta-analysis. Gastrointest Endosc 2021; 93: 77-85.e6. doi:10.1016/j.gie.2020.06.059

[10] Lafeuille P, Lambin T, Yzet C, et al. Flat colorectal sessile serrated polyp: an example of what artificial intelligence does not easily detect. Endoscopy 2021; doi:10.1055/a-1486-6220

[11] Gono K. Narrow Band Imaging: Technology Basis and Research and Development History. Clin Endosc 2015; 48: 476–480. doi:10.5946/ce.2015.48.6.476

FIGURES

Figure 1: The CONECCT Classification (version 3.1). EID, Endoscopic Intermuscular Dissection; EMR, Endoscopic Mucosal Resection; ESD, Endoscopic Submucosal Dissection; LST, Laterally Spreading Tumor; VCE, Virtual Chromoendoscopy.

Figure 2: Endoscopic visualization of green sign in white light imaging (A) and virtual chromoendoscopy (A'); Endoscopic visualization of chicken skin in white light imaging (B).

Figure 3: Examples of endoscopic visualization of green sign (bounded by green line) and chicken skin (bounded by yellow line). A, A': CONECCT IIC+ lesion in the valvula, deep submucosal adenocarcinoma; B, B': CONECCT III lesion in the transverse colon, T3 cancer; C, C': CONECCT III lesion in the left colon, superficial submucosal adenocarcinoma; D, D': CONECCT IIC+ lesion in the sigmoid, deep submucosal adenocarcinoma.

Figure 4: Flow chart of the study.

Figure 5: Microscopic examination of the resection specimen containing chicken skin (A, B) and green sign (C, D). Macrophagic infiltration with xanthomatous morphology (black arrow in A), as previously described in other studies. Increased number of lymphoid nodules at the periphery of invasive carcinoma (black arrow in B) corresponding to a hyperplastic reaction of the gut associated lymphoid tissue, which could at least partially explain the chicken skin with regularly scattered small nodules lifting the mucosa. Thinning of the mucosa (dotted double arrow in C) compared to the adenomatous mucosa (double arrow in C) as invasive glands destroy the mucosa. Destruction of the muscularis mucosae (black arrow in D, in red) by invasive glands which may contribute to the increase in the hemoglobin detection signal, resulting in the green sign.

TABLES

Table 1: Characteristics of patients.

Characteristic	
Patients, n	461
Gender, n (%)	
Male	252 (54.7)
Female	209 (45.3)
Age at diagnosis, y	
Median (range)	70 (63-76)
Indication for colonoscopy	
Positive screening test	91 (19.7)
Digestive symptoms	131 (28.4)
Hematochezia	74 (16.1)
Individual screening	163 (35.4)
PET-CT colonic fixation	26 (5.6)
Acromegaly	1 (0.2)
Other	23 (5.0)

Table 2: Characteristics of colorectal lesions.

Characteristic	
Lesions, n	803
Lesion size: large diameter, mean (SD), mm	25.92 (26.94)
Lesion size: small diameter, mean (SD), mm	23.05 (23.66)
Location, n (%)	
Caecum	138 (17.2)
Valvula	49 (6.1)
Right colon	171 (21.3)
Right angle	83 (10.3)
Transverse colon	77 (9.6)
Left angle	21 (2.6)
Left colon	57 (7.1)
Sigmoid	105 (13.1)
Rectum	101 (12.6)
Macroscopic type, n (%)	
Polypoid	290 (37.5)
Granular homogeneous LST	85 (11.0)
Granular mixt LST	150 (19.4)
Nodular LST	42 (5.4)
Flat non granular LST	51 (6.6)
Pseudodepressed non granular LST	62 (8.0)
Macronodule > 1cm, n (%)	
Yes	211 (26.3)
No	592 (73.7)
Demarcation line, n (%)	
Yes	132 (16.4)
No	671 (83.6)
Green sign, n (%)	
Yes	127 (15.8)
No	676 (84.2)
Chicken skin, n (%)	
Yes	101 (12.6)
No	702 (87.4)
Green sign and Chicken skin, n (%)	
Yes	54 (6.7)
No	749 (93.3)
Paris classification, n (%)	
Ip	26 (3.2)
Is	90 (11.2)
Is-IIa	115 (14.3)
Is-IIa-IIc	4 (0.5)
Is-IIa-Is	1 (0.1)
Is-IIc	8 (1.0)
IIa	481 (59.9)

IIa-IIc	69 (8.6)
IIc	2 (0.2)
IIc-Is	2 (0.2)
III	5 (0.6)
CONECCT classification, n (%)	
IH	45 (5.6)
IS	104 (13.0)
IIA	312 (38.9)
IIC	279 (34.7)
IIC+	34 (4.2)
III	29 (3.6)
JNET classification, n (%)	
I	145 (18.1)
IIA	445 (55.4)
IIB	150 (18.7)
III	63 (7.8)
NICE classification, n (%)	
I	152 (18.9)
II	589 (73.3)
III	62 (7.7)

LST: Laterally Spreading Tumor

Table 3: Final histology of lesions according to green sign

Characteristic	All lesions	Green sign	
		Yes	No
Lesions, n	803	127	676
Histology, n (%)			
Hyperplastic polyp	56 (7.0)	0	56 (8.3)
Sessile serrated lesion	96 (12.0)	1 (0.8)	95 (14.1)
Low-grade or high-grade dysplastic adenoma (Vienna 4.1)	498 (62.0)	43 (33.9)	455 (67.3)
Intramucosal adenocarcinoma (Vienna 4.4)	83 (10.3)	26 (20.5)	57 (8.4)
Superficial submucosal adenocarcinoma (<1000 µm)	10 (1.2)	8 (6.3)	2 (0.3)
Deep submucosal adenocarcinoma (>1000 µm)	41 (5.1)	31 (24.4)	10 (1.5)
Intramuscular or deeper cancer	19 (2.4)	18 (14.2)	1 (0.1)

Table 4: Diagnostic accuracy of green sign and chicken skin aspects for the detection of superficial and deep invasive lesions.

Superficial lesions

	Sensitivity [95% CI]	Specificity [95% CI]	Positive predictive value [95% CI]	Negative predictive value [95% CI]
Green sign:	54.2 [46.0, 62.3]	93.2 [91.0, 95.0]	65.4 [56.4, 73.6]	89.6 [87.1, 91.8]
Chicken skin:	31.4 [24.1, 39.4]	91.8 [89.5, 93.8]	47.5 [37.5, 57.7]	85.0 [82.2, 87.6]
Green sign and chicken skin	44.3 [32.4, 56.7]	90.5 [88.1, 92.5]	30.7 [21.9, 40.7]	94.4 [92.5, 96.0]
Green sign or chicken skin	62.1 [53.9, 69.8]	87.8 [85.1, 90.3]	54.6 [46.9, 62.1]	90.8 [88.2, 92.9]

Deep invasive lesions

	Sensitivity [95% CI]	Specificity [95% CI]	Positive predictive value [95% CI]	Negative predictive value [95% CI]
Green sign:	81.4 [70.3, 89.7]	90.5 [88.1, 92.5]	44.9 [36.1, 54.0]	98.1 [96.7, 99.0]
Chicken skin:	31.4 [24.1, 39.4]	91.8 [89.5, 93.8]	47.5 [37.5, 57.7]	85.0 [82.2, 87.6]
Green sign and chicken skin	42.9 [31.1, 55.3]	96.7 [95.2, 97.9]	55.6 [41.4, 69.1]	94.7 [92.8, 96.2]
Green sign or chicken skin	82.9 [72.0, 90.8]	84.2 [81.3, 86.7]	33.3 [26.4, 40.9]	98.1 [96.7, 99.0]

Table 5: Final histology of lesions according to chicken skin

Characteristic	All lesions	Chicken skin	
		Yes	No
Lesions, n	803	101	702
Histology, n (%)			
Hyperplastic polyp	56 (7.0)	0	56 (8.0)
Sessile serrated lesion	96 (12.0)	2 (2.0)	94 (13.4)
Low-grade or high-grade dysplastic adenoma (Vienna 4.1)	498 (62.0)	51 (50.5)	447 (63.7)
Intramucosal adenocarcinoma (Vienna 4.4)	83 (10.3)	17 (16.8)	66 (9.4)
Superficial submucosal adenocarcinoma (<1000 µm)	10 (1.2)	4 (4.0)	6 (0.9)
Deep submucosal adenocarcinoma (>1000 µm)	41 (5.1)	16 (15.9)	25 (3.6)
Intramuscular or deeper cancer	19 (2.4)	11 (10.9)	8 (1.1)

CONECCT v 3.1	0E Neuro-endocrine tumor	IH Hyperplastic polyp	IS Sessile serrated lesion (without dysplasia)	IIA Low-risk adenoma	IIC High-risk adenoma or superficial adenocarcinoma	IIC+ Borderline invasive adenocarcinoma	III Deeply invasive adenocarcinoma
Location	Rectum	Rectum or sigmoid	Colorectal	Colorectal	Colorectal	Colorectal	Colorectal
Macroscopic aspect	Subepithelial lesion	Often < 10 mm Paris IIa	Paris IIa or IIb **Cloud aspect Unclear margins**	Paris Ip, Is or IIa or « Valley sign »	Often IIc or **nongranular LST** or **macronodule (> 10 mm) on a granular LST**	Demarcated or depressed area	**Often III or IIc with a nodule in the depressed area** Spontaneous bleeding
Color (virtual staining)	Yellowish	Light color or equivalent to the background	Variable Yellow mucus (red in VCE)	Darker than the background	Often dark	Dark area	Heterogeneous, lighter or darker in an amorphous area
Vessels (virtual staining)	Normal	None or thin vessels across the lesion, not following the pits	Sometimes absent Through vascular network	**Regular** Following the pits	**Irregular but persistent** No avascular region	Irregular, large interrupted vessels or avascular area **< 10 mm**	Irregular, large interrupted vessels or avascular area **> 10 mm**
Pits (virtual staining)	Normal (sometimes minimal mucosal lesion)	Round shape, whitish pits	Round shape **Dark spots at the bottom of the pits**	Elongated or branched crypts, cerebriform aspect	**Irregular but persistent** No amorphous area	**Absent, amorphous, destroyed** area **< 10 mm** (clear demarcation)	Absent, amorphous, destroyed area **> 10 mm** (clear demarcation)
Resection method	R0 (ESD, EID, EFTR)	No resection if < 5 mm	EN BLOC R0 if possible (Cold snare then discard if < 10 mm) PIECE MEAL if not		EN BLOC R0 (EMR or ESD)	Diagnostic resection (ESD, EID, EFTR)	Staging SURGERY