CHAPTER 4
Treatment

Surgical treatment depends on the degree of invasion of the colon wall and the involvement of lymphatics or adjacent organs. Therefore, we will address early CRC and colon tumors with local or locoregional infiltration.

Treatment of early colon cancer (ECC)

A TCC is considered to be a lesion that affects only the mucosa and submucosa of the colon, without invading the muscularis propria. It is known that the doubling time of tumors that affect only the mucosa is longer than that of those that affect the submucosa (31 versus 25 months, respectively).[1]

Polyp is a morphological concept and is defined as a lesion in the mucosa that protrudes into the lumen of the intestine. Polyps can be characterized by the presence or absence of a pedicle, size or number. According to their histological type, they are divided into two groups: neoplastic (tubular, tubulovillous and villous adenomas, serrated polyps) and non-neoplastic (hyperplastic, inflammatory, juvenile, lipoma).[2,3]

Basis of microvascular architecture of colon lesions

Normal colonic mucosa: The capillary network of the mucosa is arranged in a cryptic pattern in the gland and is made up of arterioles and subepithelial capillaries that drain into veins that join together to form the submucosal veins. The diameter of the vessels is 8.6 ± 1.8 μm to 12.4 ± 1.9 μm (range: 6.4 - 20.9 μm). This capillary network is observed throughout the large intestine, from the cecum to the rectum.
Hyperplastic polyps: The vessel diameter in hyperplastic polyps is not significant compared to normal mucosa. The thickness of the intratumoral microinvasion is greater than in hyperplastic polyps and also greater than in normal mucosa.
Adenomas: In small adenomas (< 3 mm in diameter), the microvascular organization is similar to that of the normal colon. The vascular network is provided by arterioles and capillaries of the submucosa that drain into venules, only in the luminal lining. The capillary network on the tumor surface is preserved. The greatest difference from normal mucosa is based on an elongation of capillaries and venules and a moderate increase in microvascular diameter, which is measured at 13.1 ± 3.3 μm. Adenomas >3 mm in diameter have an elongation of microvessels. The microvascular structure of adenomas is similar to that of normal vessels, but is adapted to the configuration of the adenoma.
Carcinomas: the microvasculature of colon carcinomas is characterized by structural disorganization and a marked increase in density. However, vascular proliferation within tumors frequently results from an increase in the number and thickness of microvessels between tumor cells and a disorganization of vascular structure. Vessel diameter ranges from 18.3 ± 0.1 μm to 19.8 ± 7.6 μm (range: 2.2 - 84.5 μm).

Morphological classification or Paris classification

Macroscopically, superficial gastrointestinal lesions are classified as type 0 lesions to distinguish them from advanced tumors (types 1 to 4). The Roman numeral I is added if they are elevated more than 2.5 mm from the adjacent mucosa, II if they are elevated or depressed less than 2.5 mm, and III if they are clearly depressed (more than 2.5 mm).

Early colon tumors are classified by their morphology as protruding or polypoid and superficial or flat (Fig. 4.1). Protruding or type 0-I lesions may be pedunculated (0-Ip), subpedunculated (0-Ips), or sessile (0-Is). Superficial or type 0-II lesions may be elevated, flat, and depressed. They are subdivided into 0-IIa (slightly elevated < 2.5 mm), 0-IIb (strictly flat) and 0-IIc (slightly depressed < 1.2 mm). Type 0-III lesions (ulcer with depth > 1.2 mm) are not found in the colon. This classification allows combinations of subtypes, the most frequent being IIa + IIc and IIc + IIa (Table 4,1).[1,3-6]

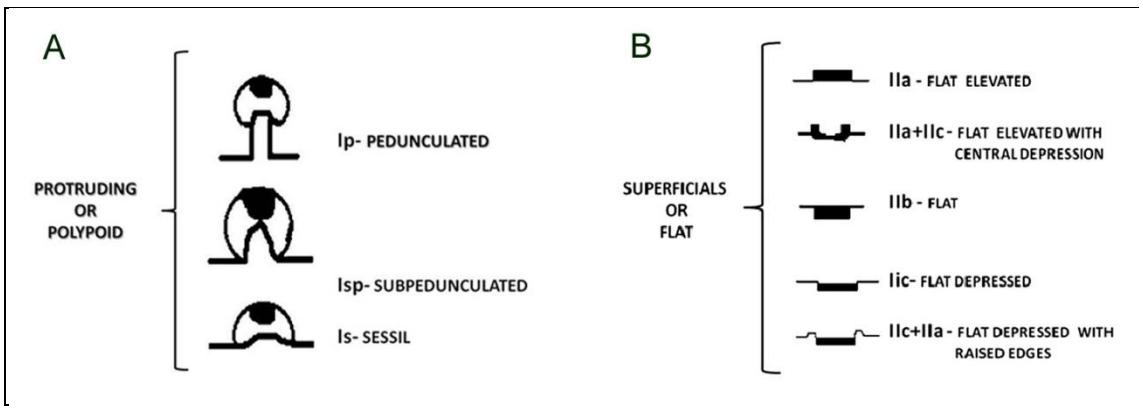


Figure 4.1. *Morphologic classification of early tumors.* ***A.*** *Protruding or polypoid lesions.* ***B.*** *Superficial or flat lesions. Adapted from the Japanese Research Society for CRC.*

Table 4.1 Paris endoscopic classification of superficial lesions type 0

Type of superficial tumoral lesion	Endoscopic appearance
0-I Polypoid	
0-Ip 0-Is	Protruded pedunculated Protruded sessile
0-II Flat: not polypoid, not excavated	
0-IIa 0-IIb 0-IIc	Flat elevated Flat Flat depressed
Mixed 0-IIc + 0-IIa Mixed 0-IIa + 0-IIc	Mostly depressed with raised borders Central depression in an elevated lesion
0-III Excavated	
Mixed 0-III + IIc o 0-IIC+III	Excavated and depressed lesions

Adapted from: Endoscopic Classification Review Group.[5]

Degree of invasion of the submucosal layer

The depth of submucosal invasion is an important prognostic factor in malignant polyps. Early tumors that invade the submucosal layer are classified according to the degree of invasion. In early polypoid tumors, the classification proposed by Haggitt et al.,[6] divides invasion into 4 levels, related to the prognosis. For sessile lesions, submucosal invasion is always level IV (Fig. 4.2).

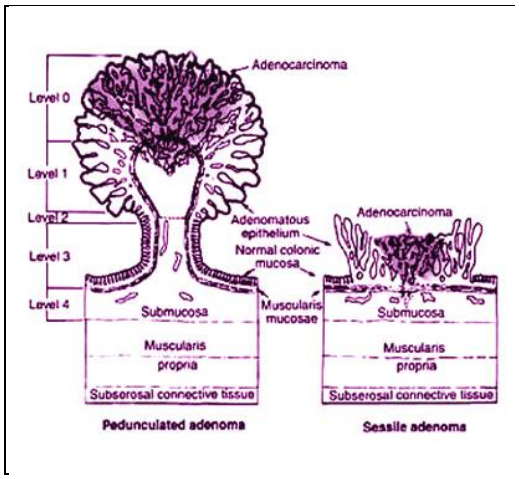


Figure 4.2. *Haggitt levels of carcinomatous invasion in polypoid lesions of the colon. Level 0: Noninvasive carcinoma, located above the muscularis mucosa. Level 1: Invasion of the mucosa and submucosa, but limited to the polyp head. Level 2: Involvement of the polyp neck (limited area between the head and the pedicle). Level 3: Invasion of the submucosa in the pedicle. Level 4: Invasion of the submucosa of the colon wall below the pedicle. Adapted from Haggitt, R. et al. Gastroenterology 1985.*[6]

Another classification for sessile lesions was proposed by Kikuchi et al.,[7] which divides the degree of vertical and horizontal invasion of the submucosa. The levels of invasion of the submucosa in depth are the upper third (Sm1), middle (Sm2) and lower third (Sm3). In turn, the upper third (Sm1) is subdivided into 3 according to the involvement or horizontal extension in relation to the size of the tumor. The Sm1a subtype invades the submucosa horizontally to an extent less than ¼ of the total tumor thickness, Sm1b invades horizontally between ¼ and ½ of the thickness and in Sm1c the horizontal invasion is greater than ½ of the tumor thickness (Fig. 4.3).

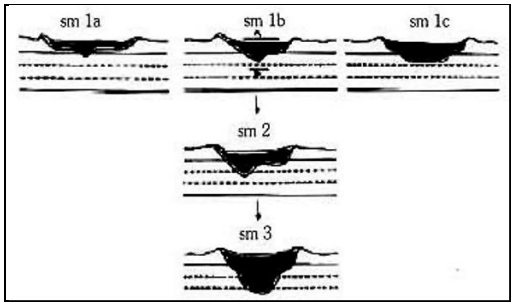


Figure 4.3. *Kikuchi classification of submucosal invasion*

.

Prognostically, Sm1 is equivalent to Haggitt level 1, Sm2 is similar to Haggitt levels 2 and 3, while Sm3 may represent Haggitt level 4. A Sm1a or Sm1b lesion without vascular invasion has a zero rate of lymph node metastasis. Lesions with deeper or more extensive involvement have the capacity to metastasize, which determines the need to add surgical treatment after endoscopic treatment in these cases.

It is also possible to measure invasion depth in microns (µm) in 3 thirds: invasion < 500 µm, 500 -1000 µm, or > 1000 µm.[8]

In 2013, a systematic review revealed that the depth of invasion Sm1, Sm2 and Sm3 was associated with positive lymph nodes in 3.4, 8.5 and 22.6%, respectively.[9]
Thus, the depth of invasion greater than 1000 µm or Sm3 is currently used for the indication of an oncological surgical resection.

Haggitt classification can also be used to stratify the risk of presenting positive lymph nodes. As Haggit et al.[6] published in 1985, in pedunculated polyps with invasion limited to the head, neck, or stem (levels 1, 2, or 3), no metastatic lymph nodes were found and only 1% of patients died of colon cancer. In contrast, in patients with level 4 invasion, defined as invasion of the base of a pedunculated polyp or a sessile polyp, 25% of patients were diagnosed with positive lymph nodes or distant metastasis, supporting the indication for surgery in these cases. Other studies have shown a 13% positive lymph node rate in Haggitt level 4.[8]

Diagnosis of polypoid or flat ECC is crucial in order to decide on its treatment based on the location, morphological type, depth of invasion and degree of histological differentiation.

The diagnosis of deep invasion can be suspected at endoscopy by signs such as erosion, ulceration, fold convergence, retraction, deformity and rigidity. Better endoscopic evaluation can be achieved by chromoendoscopy or with enhanced imaging systems such as Narrow Band Imaging (NBI), Blue Laser Imaging (BLI), magnified endoscopy, etc.[10–12]The introduction of electron chromoscopy represented a new possibility in the endoscopic study of colorectal polyps by allowing the observation of the mucosal and vascular pattern. The two

most important electron chromoscopy systems are NBI and the computerized virtual chromoendoscopy system (FICE). The latter has also been modified by new endoscopy towers that allow it to be associated in real time with Blue Laser Imaging (BLI) and Linked Color Imaging (LCI), improving the observation of the vascular pattern and the inflammatory process of the mucosa. FICE is considered to have an excellent diagnostic capacity for the mucosal pattern and less for the vascular pattern. However, the definitive endoscopic diagnosis of the histological type of the polyp remains controversial.

Kudo et al.,[13] establish in their classification the degree of malignancy of colorectal lesions according to the patterns that configure the openings of the crypts and the microvasculature (*Pitt patterns*) (Table 4.2).

Table 4.3 details the histological classification proposed by the Vienna group for gastrointestinal intraepithelial neoplasias, with recommendations for treatment and follow-up.[14]

Treatment of malignant polyp

This section will address the treatment of early colon lesions (Tis and T1), to determine which are amenable to endoscopic resection and which to surgical resection.

The standard treatment of a colon polyp, when its morphological structure allows it, is complete endoscopic resection en bloc.[1] Endoscopic resection is sufficient for hyperplastic or adenomatous polyps with noninvasive adenocarcinoma or pTis (intraepithelial/intramucosal adenocarcinoma).[1,15–18]

For invasive or pT1 adenocarcinoma, management is determined by the morphology of the polyp and the presence of histological factors associated with adverse prognosis:

- Venous or lymphatic invasion
- Grade 3 or 4 cell differentiation
- Significant tumor budding (>grade 1)

For NCCN, unfavorable histologic findings are defined as grade 3 and 4 tumors, comparable to undifferentiated or poorly differentiated tumors, positive lymphovascular invasion, and positive resection margin.[19]

In the Japanese guidelines, the pathological finding of deep submucosal invasion (greater than 1000 µm) and tumor budding grade 2 or 3 are considered an indication for an additional surgical procedure with lymph node dissection, since the risk of lymph node metastasis is higher than in lesions without these risk factors.[20]

Risk levels in malignant polyps

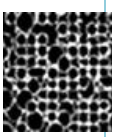
Low-risk malignant polyp

A low-risk malignant polyp, pedunculated or sessile, can be defined as a polyp with well or moderately differentiated adenocarcinoma, without vascular or lymphatic invasion, without perineural invasion, without tumor budding or with low-grade budding, with negative resection margin, submucosal invasion less than 1 mm (1000 µm) and Haggitt invasion level 1, 2 or 3 in pedunculated polyps. Endoscopic resection is considered a definitive treatment in these patients with a minimal risk of residual disease or lymph node involvement.

High-risk malignant polyp

When a polyp, whether sessile or pedunculated, presents poorly differentiated adenocarcinoma, positive or indeterminate margin, submucosal invasion greater than 1 mm (1000 µm), vascular, lymphatic or perineural invasion, high-grade tumor budding and Haggitt level 4 invasion, oncologic surgical resection should be guaranteed because the risk of recurrence in the colon wall or regional lymph nodes is unacceptably high.

Table 4.2. Kudo classification describing the different patterns ofcolonic glandular crypts observable with chromoendoscopy.

Pattern	Characteristics of crypt openings	Size (mm)	Diagram	Histology
I	Regular round	0.02		Normal colon
II	Stellated or papillary	0.02		70% Hyperplastic polyps 30% Adenomas
III S (short)	Round tubular, smaller than those of pattern I	0.01		86% Adenomas 13% Carcinomas
III L (large)	Long tubular	0.09		93% Adenomas 4.2% Carcinomas
IV	Grooves or turns (encephaloid)	0.032		75% Adenomas 22% Carcinomas
V	(Vi= irregular) (Vn= non-structured)			61% Carcinomas 39% Adenomas 93% Carcinomas 7% Adenomas

.

Table 4.3. Revised Vienna histological classification of gastrointestinal superficial epithelial neoplasms and treatment recommendations.

Category	Consequence	Recommendation
1. Negative for neoplasia	Normal, reactive, regenerative, hyperplastic, atrophic and metaplastic epithelium	Optional follow-up
2. Indefinite for neoplasia	Doubt about origin	Follow-up
3. Low-grade dysplasia: noninvasive neoplasia	Noninvasive neoplasia No risk of metastasis	Endoscopic resection and follow-up
4. High-grade dysplasia: noninvasive neoplasia 4.1 Adenoma with high-grade dysplasia 4.2 Carcinoma in situ 4.3 Suspected invasive carcinoma 4.4 Intramucosal carcinoma	Noninvasive neoplasia No risk of metastasis	Endoscopic resection and follow-up
5. Carcinoma with submucosal invasion	Invasive neoplasia Risk of metastasis	Endoscopic resection/Surgical treatment (According to histological risk factors)

Endoscopic treatment of malignant colon polyp

Endoscopic techniques include mucosal resection, endoscopic submucosal dissection, or a combination of endoscopic and laparoscopic techniques to avoid segmental colectomy in patients with low-risk polyps.[21] A complete endoscopic en bloc resection (not piecemeal resection), generally guarantees cure in more than 80% of patients.[22]

The definition of a negative margin after a polypectomy is a matter of debate. Initially, the need for a margin of more than 2 mm was maintained.[22] Subsequently, in 2012 in the United States, a review of 143 colectomized patients found residual cancer at the polypectomy site in 0, 9, and 16% and in regional nodes in 5, 21, and 7%, when the resection margin was ≥1 mm, <1 mm, or intermediate, respectively. [23]

In 2013, an analysis from the Northern Colorectal Cancer Study Group in England determined that endoscopic resection margins of 0 and >0 mm resulted in residual cancer at the polypectomy site or in regional nodes in 34% and 15% of cases, respectively.[15]

In 2018, the Scottish National Study found a 7% incidence of residual cancer in lymph nodes after polypectomy. In patients with incomplete polypectomy, residual cancer at the site was 29% and in regional nodes 9%. This study also demonstrated that a margin ≥ 1 mm does not reduce the risk of cancer when compared with a safety margin ≥ 0 mm.[2]

In 2013, a systematic review and meta-analysis of patients with pT1 CRC who did not undergo surgery demonstrated an incidence of lymph node involvement of 11%. It also showed that when associated with lymphovascular invasion, submucosal invasion ≥ 1 mm, poorly differentiated cancer, and tumor budding, lymph node involvement was 22%, 12%, 24%, and 21%, respectively.[24]

Fig. 4.4 shows the treatment scheme for an early polyp-cancer with and without histological risk factors for metastasis, according to ESMO guidelines.[25]

Surgical treatment of malignant colon polyp

The treatment strategy for early colon tumor, published by the Japanese guidelines, can be seen in Fig. 4.5. The presence of pT1 invasive cancer in a polyp requires review by the pathologist and the surgeon or endoscopist.[1,19,25,26]

For pedunculated polyps with pT1 adenocarcinoma confined to the head, neck, or stem, i.e., Haggitt 1-3, endoscopic resection with adequate endoscopic follow-up is sufficient, even in the presence of submucosal invasion if there are no other unfavorable prognostic factors at the time of resection. Evidence 4B.[25]

On the other hand, the presence of any unfavorable factor, or of a flat or sessile polyp according to the Paris classification with pT1 adenocarcinoma, determines the need for surgical resection in patients with adequate operative risk. Evidence 4B.[25]

The goal of surgical treatment is complete resection of the lesion including removal of lymph nodes for optimal postoperative outcome. Evidence 4B.[25]

The finding of positive resection margins, i.e. less than 1 mm, constitutes only a risk of local recurrence and can be managed by a new endoscopic resection, or by strict endoscopic follow-up.

High-risk findings in a polyp with pT1 invasive cancer indicate the need for surgical resection with lymphadenectomy. These factors include lymphatic or venous invasion, grade III cellular differentiation, and significant tumor budding (> 1). Evidence IVB. [25]

When surgery is not possible due to comorbidities or high patient risk, endoscopic follow-up within 6 months of polyp removal is recommended, as well as oncologic evaluation including CT scan for possible detection of lymph node recurrence. Evidence 4B.[25]

It should not be forgotten that endoscopic resection is primarily intended for diagnosis and, secondarily, for treatment. En bloc resection should be performed as a first option so that, if invasive cancer is detected in the specimen, the pathologist can correctly assess the margin.

In early carcinoma, en bloc resection should be performed, piecemeal resection should be avoided. Resection of lesions larger than 2 cm should not be attempted, except by highly trained teams in complex endoscopy, either polypectomy or endoscopic mucosal resection (EMR). On the contrary, endoscopic submucosal dissection (ESD) allows resection of larger lesions, regardless of size or location, with very good results. Due to the high number of perforations, resection using a cap or devices for the removal of the entire colonic wall is not recommended. This last procedure is known as endoscopic transmural resection or FTRD-Ovesco.

In conclusion, whether endoscopic resection or oncologic surgical resection is performed depends on the size of the lesion and histopathological findings. Evidence IB.[25]

Treatment of colon tumors with local infiltration

This section refers to the treatment of lesions or tumors that infiltrate the muscular layer of the colon, as well as lesions with a high risk of lymphatic invasion.[27,28]

Surgical resection is the only curative treatment for locoregionally invasive colon cancer. Outcome is related to the extent of the disease and recurrence arises from clinically occult micrometastases present at the time of surgery.[29,30]

Infiltrating colonic tumors cannot be resected by colonoscopy and require surgical resection with the aim of wide resection of the involved intestinal segment and its lymphatic drainage. Evidence IA.[31]

The extent of colon resection is determined by the location of the tumor, the location of the nutrient artery of the segment to be resected, and the distribution of regional lymph nodes. Surgical resection should include a segment of the colon at least 5 cm proximal and distal to the tumor, although occasionally, due to the vascular distribution of the area to be resected, the margins on either side of the tumor should be wider. Evidence 4B.[31]

En bloc colonic resection with its mesocolon is recommended to determine whether the patient is in Stage II or Stage III, i.e. whether or not regional lymph nodes are involved. This resection should include at least 12 lymph nodes. Evidence 4B.[25]

In the case of involvement of neighbouring organs, i.e. in Stage 4B tumours, resection of the involved organ or segment should be included. Evidence IB. [31]

At the beginning of the procedure, a complete evaluation of the peritoneal cavity and female adnexa should be performed to exclude possible metastases. Evidence IC.[31]

Laparoscopic colectomy can be performed safely when there is adequate training in the technique and in the absence of contraindications. It leads to reduced morbidity, improved tolerance and the same oncological outcome. Evidence IC. [31]

Complicated tumors will be discussed in a separate chapter, but in general we will say that obstructive cancers can be treated in one, two, or three stages. Two-stage procedures include primary resection with protective colostomy followed by closure of the ostomy, or a Hartmann procedure followed by restoration of intestinal continuity, in the case of an obstruction with deterioration of general condition or intestinal perforation. The one-stage procedure is preferred if the patient's condition permits it and the experience of the team is adequate. Subtotal colectomy or segmental resection after intraoperative colonic lavage are alternatives in selected cases. Evidence III.[31,32]

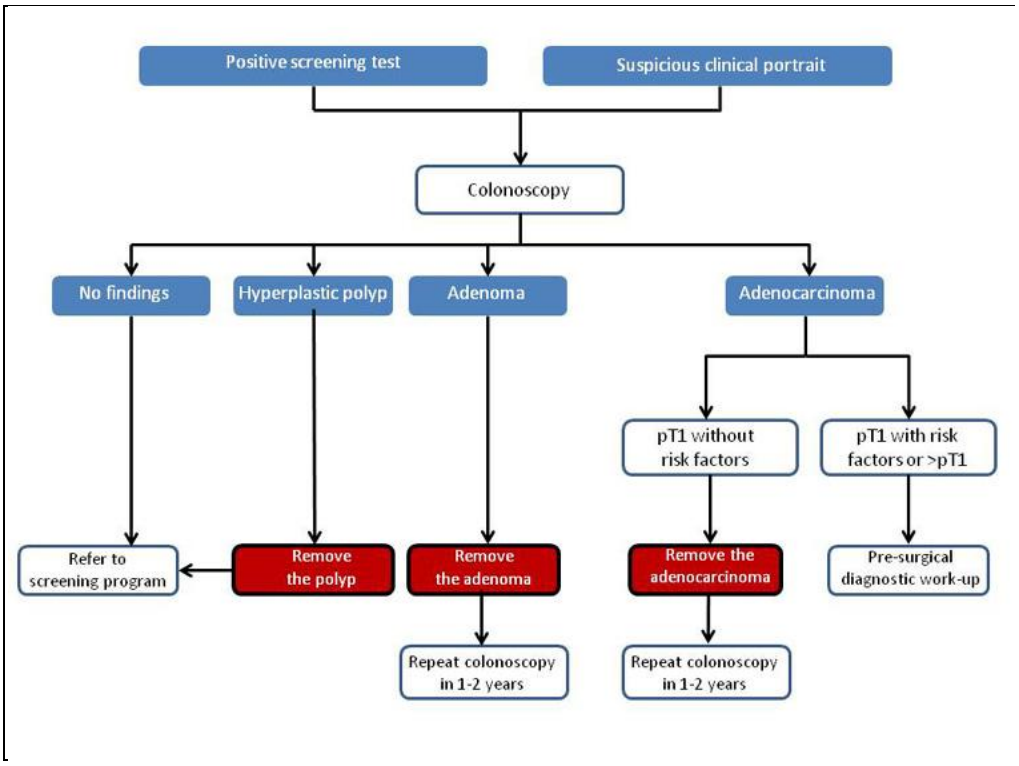


Figure 4.4. *Treatment regimen for benign polyps, and pT1 malignant polyps with and without histological risk factors.*

Final recommendations

- En bloc endoscopic resection is sufficient for polyps with noninvasive adenocarcinoma (pTis, intraepithelial, intramucosal). Evidence IVB.
- The presence of invasive cancer in a polyp requires review by the surgeon, endoscopist, and pathologist.
- The presence of high-risk factors indicates surgical resection of the colon segment plus lymphadenectomy.
- High-risk factors include: lymphatic invasion, venous invasion, grade III cell differentiation, significant tumor budding. Evidence 4B.
- Laparoscopic colectomy is safe in terms of morbidity, tolerance, and oncologic progression. Evidence IC.

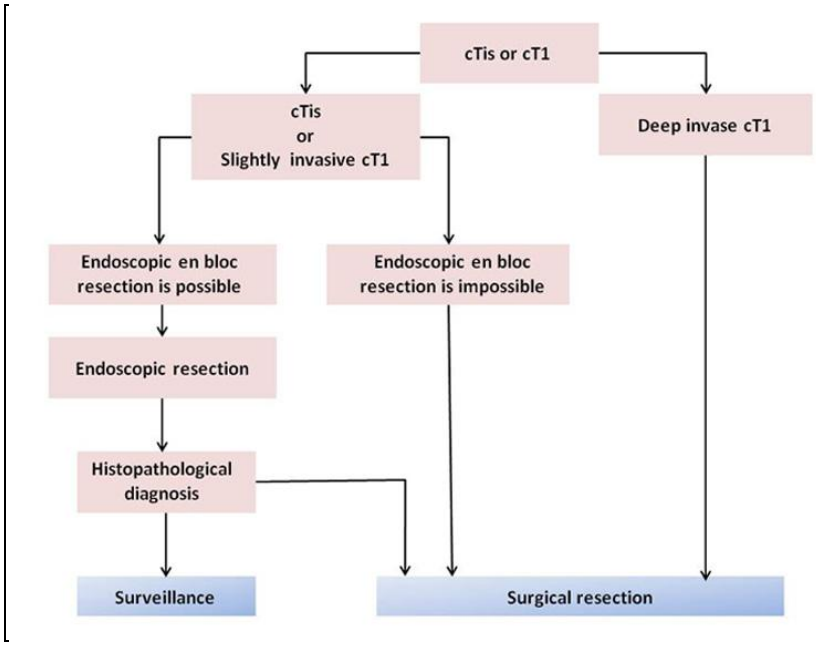


Figure 4.5. *Surgical treatment of noninvasive (cTis) and invasive (cT1) early colorectal epithelial lesions.*

REFERENCES

1. Pastore RLO, Svidler López L, Ganduglia M, Ochoa F R. Pólipos colorrectales no hereditarios. *Rev Argent Coloproct.* 2009;20(3):111–76.
2. Richards CH, Ventham NT, Mansouri D, Wilson M, Ramsay G, Mackay CD, et al. An evidence-based treatment algorithm for colorectal polyp cancers: results from the Scottish Screen-detected Polyp Cancer Study (SSPoCS). *Gut.* 2018;67(2):299–306.
3. Shaukat A, Kaltenbach T, Dominitz JA, Robertson DJ, Anderson JC, Cruise M, et al. Endoscopic recognition and management strategies for malignant colorectal polyps: recommendations of the US Multi-Society Task Force on colorectal cancer. *Gastrointest Endosc.* 2020;92(5):997–1015.e1.
4. The Paris endoscopic classification of superficial neoplastic lesions: esophagus, stomach, and colon: November 30 to December 1, 2002. *Gastrointest Endosc.* 200358(6 Suppl):S3–43.
5. Endoscopic Classification Review Group. Update on the Paris classification of superficial neoplastic lesions in the digestive tract. *Endoscopy.* 2005;37(6):570–78.
6. Haggitt RC, Glotzbach RE, Soffer EE, Wruble LD. Prognostic factors in colorectal carcinomas arising in adenomas: implications for lesions removed by endoscopic polypectomy. *Gastroenterology.* 1985;89(2):328–36.
7. Kikuchi R, Takano M, Takagi K, Fujimoto N, Nozaki R, Fujiyoshi T, et al. Management of early invasive colorectal cancer. Risk of recurrence and clinical guidelines. *Dis Colon Rectum.* 1995;38(12):1286–95.
8. Yamamoto S, Watanabe M, Hasegawa H, Baba H, Yoshinare K, Shiraishi J, et al. The risk of lymph node metastasis in T1 colorectal carcinoma. *Hepatogastroenterology.* 2004;51(58):998–1000.
9. Bosch SL, Teerenstra S, de Wilt JHW, Cunningham C, Nagtegaal ID. Predicting lymph node metastasis in pT1 colorectal cancer: a systematic review of risk factors providing rationale for therapy decisions. *Endoscopy.* 2013;45(10):827–34.
10. Emura F, Saito Y, Ikematsu H. Narrow-band imaging optical chromocolonoscopy: advantages and limitations. *World J Gastroenterol.* 2008;14(31):4867–72.
11. Sano Y, Horimatsu T, Fu KI, Katagiri A, Muto M, Ishikawa H. Magnifying observation of microvascular architecture of colorectal lesions using a narrow-band imaging system. Digestive *Endoscopy.* 2006;18:S44–51.
12. Kudo S, Tamura S, Nakajima T, Yamano H, Kusaka H, Watanabe H. Diagnosis of colorectal tumorous lesions by magnifying endoscopy. *Gastrointest Endosc.* 1996;44(1):8–14.
13. Kudo S, Rubio CA, Teixeira CR, Kashida H, Kogure E. Pit pattern in colorectal neoplasia: endoscopic magnifying view. *Endoscopy.* 2001;33(4):367–73.
14. Schlemper RJ, Riddell RH, Kato Y, Borchard F, Cooper HS, Dawsey SM, et al. The Vienna classification of gastrointestinal epithelial neoplasia. *Gut.* 2000;47(2):251–55.
15. Williams JG, Pullan RD, Hill J, Horgan PG, Salmo E, Buchanan GN, et al. Management of the malignant colorectal polyp: ACPGBI position statement. *Colorectal Dis.* 2013;15 Suppl 2:1–38.
16. Hassan C, Zullo A, Risio M, Rossini FP, Morini S. Histologic risk factors and clinical outcome in colorectal malignant polyp: a pooled-data analysis. *Dis Colon Rectum.* 2005;48(8):1588–96.
17. Brown IS, Bettington ML, Bettington A, Miller G, Rosty C. Adverse histological features in malignant colorectal polyps: a contemporary series of 239 cases. *J Clin Pathol.* 2016;69(4):292–99.
18. Ueno H, Mochizuki H, Hashiguchi Y, Shimazaki H, Aida S, Hase K, et al. Risk factors for an adverse outcome in early invasive colorectal carcinoma. *Gastroenterology.* 2004;127(2):385–94.
19. Benson AB, Venook AP, Adam M, Chang G, Chen YJ, Ciombor KK, et al. Colon Cancer, Version 3.2024, NCCN Clinical Practice Guidelines in Oncology. *JNCCN* [Internet]. 2024 Jun 1 [cited 2024 Oct 22];22(2D). Available from: https://jnccn.org/downloadpdf/view/journals/jnccn/22/2D/article-e240029.pdf
20. Hashiguchi Y, Muro K, Saito Y, Ito Y, Ajioka Y, Hamaguchi T, et al. Japanese Society for Cancer of the Colon and Rectum (JSCCR) Guidelines 2019 for the treatment of colorectal cancer. *Int J Clin Oncol.* 2019;25(1):1–42.

21. Volk EE, Goldblum JR, Petras RE, Carey WD, Fazio VW. Management and outcome of patients with invasive carcinoma arising in colorectal polyps. *Gastroenterology.* 1995;109(6):1801–7.
22. Ferlitsch M, Moss A, Hassan C, Bhandari P, Dumonceau JM, Paspatis G, et al. Colorectal polypectomy and endoscopic mucosal resection (EMR): European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. *Endoscopy.* 2017;49(3):270–97.
23. Butte JM, Tang P, Gonen M, Shia J, Schattner M, Nash GM, et al. Rate of residual disease after complete endoscopic resection of malignant colonic polyp. *Dis Colon Rectum.* 2012;55(2):122–27.
24. Sanchez-Yague A, Kaltenbach T, Raju G, Soetikno R. Advanced endoscopic resection of colorectal lesions. *Gastroenterol Clin North Am.* 2013;42(3):459–77.
25. Argilés G, Tabernero J, Labianca R, Hochhauser D, Salazar R, Iveson T, et al. Localised colon cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol.* 2020;31(10):1291–305.
26. Aarons CB, Shanmugan S, Bleier JIS. Management of malignant colon polyps: current status and controversies. *World J Gastroenterol.* 2014;20(43):16178–83.
27. Gorgun E, Benlice C, Church JM. Does cancer risk in colonic polyps unsuitable for polypectomy support the need for advanced endoscopic resections? *J Am Coll Surg.* 2016;223(3):478–84.
28. Repici A, Hassan C, De Paula Pessoa D, Pagano N, Arezzo A, Zullo A, et al. Efficacy and safety of endoscopic submucosal dissection for colorectal neoplasia: a systematic review. *Endoscopy.* 2012;44(2):137–50.
29. Backes Y, Elias SG, Groen JN, Schwartz MP, Wolfhagen FHJ, Geesing JMJ, et al. Histologic factors associated with need for surgery in patients with pedunculated T1 colorectal carcinomas. *Gastroenterology.* 2018;154(6):1647–59.
30. *Bujanda L, Cosme A, Gil I, Arenas-Mirave JI. Malignant colorectal polyps. World J Gastroenterol.* 2010;16(25):3103–11.
31. Vogel JD, Felder SI, Bhama AR, Hawkins AT, Langenfeld SJ, Shaffer VO, et al. The American Society of Colon and Rectal Surgeons Clinical Practice Guidelines for the management of colon cancer. *Dis Colon Rectum.* 2022;65(2):148–77.
32. Wong MC, Ding H, Wang J, Chan PS, Huang J. Prevalence and risk factors of colorectal cancer in Asia. *Intest Res.* 2019;17(3):317–29.