



Carcinoid Tumors in Colorectal Surgery

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No Disclosure

Introduction:

Well-differentiated neuroendocrine tumors (NETs) originate in the gastrointestinal tract and lung

→ **Carcinoid Tumour**

Well-differentiated NETs that arise in the pancreas

→ **Pancreatic NETs.**

Introduction:

NETs are graded as low (G1), intermediate (G2), and high (G3) grade.

Grade refers to the proliferative activity of tumors, commonly measured by the mitotic rate and Ki-67 index

Poorly differentiated neuroendocrine carcinomas (NECs) are by definition **high-grade carcinomas** that resemble small cell carcinoma or large cell NEC of the lung

Incidence:

- According to the (WHO) classification, colorectal carcinoids are grouped together and are distinguished from those of the appendix or ileum
- **Colonic carcinoids** constitute 7.5% of NETs and 18% of GIT (NETs), mean age of onset is the 7th decade of life.
- **Rectal carcinoids** constitute 18% of all NETs and 27% of GIT(NETs) , The rectum is the second localization by frequency after the small intestine.
- **Cecum** is the most common location of colon carcinoids

Classification and staging of colorectal NETs

Classification for GIT NET (WHO, 2022)

Gastrointestinal and pancreatobiliary tract		
Well-differentiated neuroendocrine tumor (NET)	NET, grade 1	< 2 mitoses/2 mm ² and/or Ki67 < 3%
	NET, grade 2	2–20 mitoses/2 mm ² and/or Ki67 3–20%
	NET, grade 3	> 20 mitoses/2 mm ² and/or Ki67 > 20%
Poorly differentiated neuroendocrine carcinoma (NEC)	Small cell NEC	> 20 mitoses/2 mm ² and/or Ki67 > 20% (often > 70%), and small cell cytomorphology
	Large cell NEC	> 20 mitoses/2 mm ² and/or Ki67 > 20% (often > 70%), and large cell

TNM Staging of colorectal NET (AJCC/UICC, 2017)

T — primary tumour	
pTX	The main tumour has not been assessed
pT1	The tumour is confined to the mucosa and submucosa and does not exceed 2 cm in diameter
pT1a	The tumour is confined to the mucosa and submucosa and does not exceed 1 cm in diameter
pT1b	The tumour is confined to the mucosa and submucosa and its diameter is 1–2 cm
pT2	The tumour infiltrates the muscularis propria or is larger than 2 cm in diameter
pT3	The tumour infiltrates the subserous tissue or the pericolonic and perirectal tissues not covered by the peritoneum
pT4	The tumour infiltrates the peritoneum and other organs
N — regional lymph nodes	
pNX	Regional lymph nodes have not been assessed
pN0	No regional lymph node involvement
pN1	Regional lymph node involvement
M — distant metastases	
pM0	No distant metastases
	The presence of distant metastases
pM1	<ul style="list-style-type: none"> • M1a — metastases limited to the liver • M1b — metastases to at least one non-hepatic region (e.g. lungs, ovaries, distant lymph nodes, peritoneum, bones) • M1c — metastases both to the liver and to non-hepatic regions

Clinical Presentation

- Colonic carcinoids:

- Asymptomatic; The majority are discovered accidentally
- Diarrhea, abdominal pain, anorexia, weight loss or palpable mass.
- Obstruction and constipation from adhesions or stricturing of the intestinal lumen.
- Carcinoid syndrome is rare because most are nonsecretory (< 5%)
- Classic carcinoid symptoms of cutaneous flushing and gut hypermotility
- Distant metastases are found in 16–40% of patients

Clinical Presentation

- Rectal carcinoids:
- Asymptomatic; The majority are discovered accidentally
- bleeding, change in bowel habits, or pain.
- Carcinoid syndrome (<0.1%)
- Distant metastases at diagnosis in 2-8%.

Diagnosis and Staging:

I. Histological diagnosis is mandatory in all patients

- Carried out on endoscopic, resection specimens or core biopsies in advanced disease
- IHC detection of the neuroendocrine markers synaptophysin , chromogranin A, (NSE) and CD56 markers
- Mitotic figures and Ki-67 index are crucial for grading

II. Biochemical markers: Serum chromogranin A (CgA) and 24-h urine 5-hydroxyindoleacetic acid (5-HIAA) testing in metastatic NETs although colorectal NETs rarely secrete serotonin.

Diagnosis and Staging:

III. Anatomic imaging (Localization):

- Computed tomography (CT) abdomen and pelvis constitutes the basic radiological study for the assessment of location, extent of disease, lymph nodes and liver metastases.
- Chest CT is also recommended to study lung metastases
- MRI (contrast-enhanced) should be preferred compared with CT for the detection of small liver metastases, pancreas, and bone lesions as a result of its higher sensitivity

Diagnosis and Staging:

- Pelvic MRI and/or endorectal ultrasound (EUS) to determine depth of tumor invasion and lymph node status for rectal neoplasms greater than 1 cm in size or with high-risk features.
- Full colonoscopy to evaluate synchronous or adenomatous lesions in the colon and rectum (about 8%) and for biopsies.

Diagnosis and Staging:

IV. Functional imaging:

- Most NETs overexpress high-affinity somatostatin receptors (SSTR), so SSTR based imaging should be part of the initial staging
- (Gallium-68 PET/CT) has become the preferred modality for SSTR imaging as a result of its higher sensitivity and used for:
 - Baseline whole-body staging, detecting of small lymph-node or bone metastases, and
 - Identification of the primary site in cases of occult origin

Diagnosis and Staging:

- (FDG-PET/CT) may be considered in:
 - High G2 and G3 NETs, which generally have less SSTR expression and higher glucose metabolisms than low grade NETs,
 - Negative SSTR imaging or
 - Rapidly growing disease

Surgical Management of Colorectal NETs

- Surgery is the treatment of choice for local or locoregional disease in NET G1 and G2.
- In functional NETs, clinical symptoms should be managed before any intervention.
- Debulking surgery is recommended for alleviating symptoms of the carcinoid syndrome in patients affected by metastatic functioning NETs.
- Patients with symptoms related to tumour burden, debulking surgery may also be beneficial.

I- Colonic NETs:

A-Patients with NETs without distant metastases:

- Treatment is similar to Surgical treatment of colonic adenocarcinoma.
- Managed with formal partial colectomy and regional lymphadenectomy (open or laparoscopic access) because most tumors are >2 cm and/or invasive through the muscularis propria

B-Patients with NETs G1 and G2 with distant metastases: (usually to the liver);

- Palliative resection with regional lymphadenectomy
- if possible, maximal cytoreduction of the tumour, even if complete reduction is not achieved

C-Patients with tumour invasion of the adjacent organs:

If possible from the technical point of view, a multi-organ resection with left- or right-sided hemicolectomy or extensive resection of the transverse colon, plus appropriate lymphadenectomy.

II- Rectal NETs:

A-Patients with NETs without distant metastases:

➤ **Local Resection (TEM,EMR,ESD):**

- Tumour size < 1 cm
- Limited to mucosa or submucosa (T1)
- Absence of lymph node metastasis
- Good tumour differentiation
- Tumour size 1-2 cm, with low mitotic rate (or Ki-67 index) and no LVI.

➤ **Radical Surgical Resection :**

- Tumour size >2 cm
- T3 and T4 tumours
- Regional lymph node metastasis
- G2/G3 tumour, KI-67 > 3%, high mitotic index >2/2 mm².
- Tumours with LVI.

❖ Procedure:

- APR: If tumour invade sphincter, incontinence or anal canal NETs
- Sphincter saving surgery: LAR, ULAR, ISR \pm Diverting stoma
- TME is mandatory

B-Patients with tumour invasion of the adjacent organs:

- If possible from the technical point of view, a multi-organ resection is performed

C-Patients with NETs G1 and G2 with distant metastases:

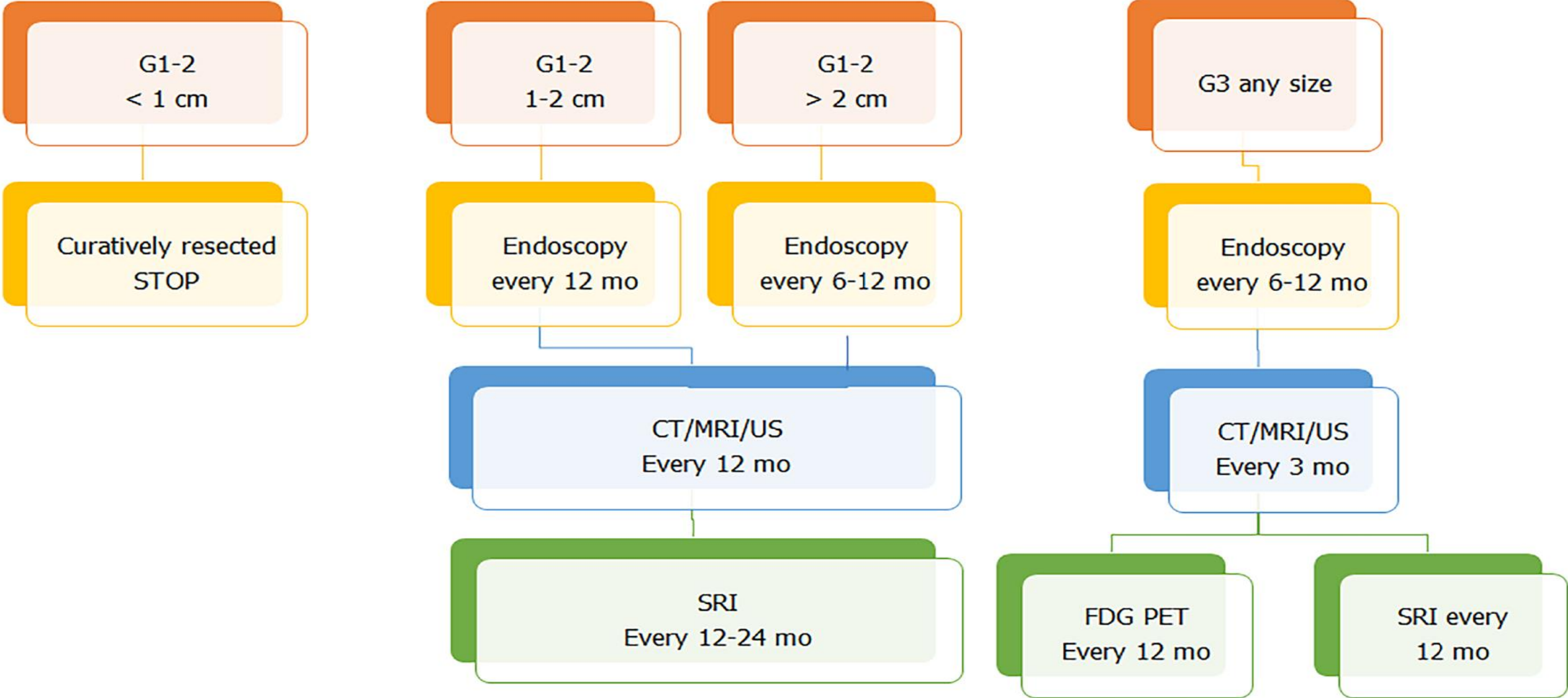
(limited to the liver);

- Radical local excision of the tumour with subsequent liver metastasectomy.
- Palliative surgery is indicated in the case of a bleeding tumour if local haemostasis is ineffective (e.g. argon plasma coagulator), or gastrointestinal obstruction
- palliative surgery, either as primary tumour resection or debulking surgery, is still controversial.

Precautions during Surgery with **carcinoid syndrome**:

- **Localized disease**: to avoid carcinoid crisis. Somatostatin analogue (**SSA**) 250 to 500 ug IV before induction of anesthesia and as necessary throughout the surgery. It can be discontinued on postoperative day one if there are no issues
- **Advanced disease**: patients likely to receive long-term SSA postoperatively. So, **Cholecystectomy** should be performed at the time of their surgical resection. because these patients are at risk for developing cholelithiasis and biliary symptoms

Surveillance of rectal NETs:



Surveillance of colonic NETs:

- Rectal and colonic NETs that are formally resected with lymphadenectomy should be followed every 6-12 months for at least 7-10 years.
- Follow up includes:
 - MSCT or MRI of the abdomen and pelvis,
 - Chromogranin A and urine 5-HIAA.

Prognosis:

Colon NETs:

- More aggressive and have **worse** survival compared with small bowel, appendiceal, and rectal NETs.
- Colonic NETs are frequently right sided and may be clinically occult until locally advanced.
- All stages 5-year survival is about 40-70%.
- 5-year survival for localized, regional, and metastatic colon NETs is 80%, 40%, and 30%, respectively.

Prognosis:

Rectal NETs:

- **Best** overall survival compared with small bowel, appendiceal, and colon NETs.
- All stages 5-year survival is about 76-88%.
- 5-year survival of node-positive rectal NET is 54-73%
- 5-year survival of metastatic rectal NETs is 15-32%
- High-grade **colorectal neuroendocrine cancers** has a dismal prognosis, the median survival of all stages about 9 months.



Thank you