

Contents

Subjects	Page
List of abbreviations.....	II
List of Figures.....	III
List of Tables.....	VII
• Introduction	1
• Aim of the Work	4
• Anatomy of Gastrointestinal Tract	5
• Epidemiology of Carcinoid Tumours	28
• Pathology and Tumor Histology of Carcinoid Tumours	36
• Clinical Manifestations of Gastrointestinal Carcinoid Tumors	57
• Diagnostic Procedures for Gastrointestinal Carcinoid Tumors	76
• Treatment of Gastrointestinal Carcinoid Tumors and Carcinoid Syndrome	112
• Summary and Conclusion	142
• References	145
• Arabic Summary	

List of Abbreviations

Abbrev.	Meaning
5-HIAA	5-Hydroxyindoleacetic Acid
5-HT	Serotonin
5-HTP	5-Hydroxytryptophan
ACTH	Adrenocorticotrophic Hormone
AJCC	American Joint Committee on Cancer
APR	Abdominal Perineal Resection
APUDomas	Amine Precursor Uptake and Decarboxylation cell tumors
B-MSH	Beta-Melanocyte-Stimulating Hormone
CE	Capsule Endoscopy
CEUS	Contrast Enhanced US
Cg A	Chromogranin A
CHD	Carcinoid Heart Disease
CT	Computed Tomography
EC	Enterochromaffin
ECL	Enterochromaffin-like
EGD	Esophagogastroduodenoscopy
ESMR	Endoscopic Submucosal–Mucosal Resection
EUS	Endoscopic US
FNA	Fine-Needle Aspiration
GEP-NETs	Gastroenteropancreatic Neuroendocrine tumors
GI	Gastrointestinal
GIP	Gastric Inhibitory Polypeptide
GRFoma	Acromegaly due to Growth hormone-Releasing Factors
HAE	Hepatic Arterial Embolization
HAE	Hepatic Artery Embolization
IFN- α	Interferon- α
LAR	Low Anterior Resection
LES	Lower Esophageal Sphincter

List of Abbreviations

MCS	Malignant Carcinoid Syndrome
MDCT	Multidetector Computed Tomography
MEN 1	Multiple Endocrine Neoplasia Syndrome-type 1
MIBG	Meta-Iodobenzylguanidine
MRI	Magnetic Resonance Imaging
MTOR	Mammalian Target Of Rapamycin
MVT	Multivisceral Transplantation
Nd-YAG	Neodymium-doped Yttrium Aluminium Garnet
NETs	Neuroendocrine Tumors
NF1	Neurofibromatosis-type 1
OLT	Orthotopic Liver Transplantation
OLT	Orthotopic Liver Transplantation
PET	Positron Emission Tomography
PP	Pancreatic Polypeptide
PRRT	Peptide Receptor Radionuclide Therapy
SA	Somatostatin Analogs
SEER	Surveillance, Epidemiology, and End-Results
SIR	Selective Internal Radiotherapy
SPECT	Single-Photon Emission Computerized Tomography
SSTR	Somatostatin Receptor
SSTR 1–5	Somatostatin Subtype Receptors 1–5
TAUS	Transabdominal Ultrasound
UGE	Upper Gastrointestinal Endoscopy
VEGF	Vascular Endothelial Growth Factor
VHL	Von Hippel-Lindau Syndrome
VIP	Vasoactive Intestinal Peptide
VIPoma	Pancreatic endocrine tumor that secretes Vasoactive Intestinal Polypeptide
WHO	World Health Organization
ZE	Zollinger-Ellison Syndrome

List of Figures

<u>No.</u>	<u>Figure</u>	<u>Page</u>
<u>1</u>	Arterial Supply and Venous Drainage of the Stomach	11
<u>2</u>	Arterial Supply and Venous Drainage of the Small Bowel	17
<u>3</u>	Arterial Supply and Venous Drainage of the Appendix	20
<u>4</u>	Parts of large intestine	22
<u>5</u>	Endoscopic view of submucosal tumor in the terminal ileum seen on colonoscopy	30
<u>6</u>	6A: Gross specimen of resected ileal carcinoid. 6B: Higher magnification of the ileal carcinoid. 6C: H&E stain of the ileal carcinoid.	36
<u>7</u>	Synthesis, secretion and metabolism of serotonin (5-HT) and 5-hydroxytryptophan (5-HTP) in patients with typical and atypical carcinoid syndrome	36
<u>8</u>	Barium contrast small bowel X-ray study	86
<u>9</u>	Ultrasound Image Showing Thickening of The wall of the fundus	88
<u>10</u>	Ultrasound Image Showing Thickening In the Region of Antrum	88
<u>11</u>	Carcinoid tumor involving ileum in the mesentery, and here is the desmoplastic reaction, these finger-like projections coming out of the tumor	90
<u>12</u>	A primary carcinoid tumor (mesenteric mass) & a 3D map of just some of the nodal spread	90

List of Figures

<u>No.</u>	<u>Figure</u>	<u>Page</u>
<u>13</u>	CT of the abdomen showed an eccentric soft tissue mass	92
<u>14</u>	Ct Image Showing Soft Tissue Attenuation Mass Lesion In relation To Fundus and Greater Curvature of The Stomach	93
<u>15</u>	Ct Image Showing Hypo dense Mass Lesion Projecting into the Lesser Sac	93
<u>16</u>	CT scan image showing polypoidal lesion at ileocaecal junction	94
<u>17</u>	Malignant carcinoid of ileum	95
<u>18</u>	CT illustrates the heterogeneous appearance of bilobar liver metastases from a small bowel carcinoid tumor	96
<u>19</u>	MRI showing metastatic midgut carcinoid with extensive liver involvement	97
<u>20</u>	Follow-up MRI at 4 months after right trisegmental resection	97
<u>21</u>	Somatostatin Receptors Scintigraphy identified the hypermetabolic hyperfixation by multiples liver metastasis but failed to localize the primary tumor	99
<u>22</u>	111In-pentetreotide-SPECT/CT for localization of a primary carcinoid tumor (A) Planar whole-body (WB) scintigraphy (left: anterior, right: posterior) (B) SPECT/CT images of the abdomen (lower row) in the transaxial (right column) and coronal (left column) planes provide precise localization of focal uptake seen on SPECT (middle row) to a primary tumor in the distal ileum (upper row)	100

List of Figures

<u>No.</u>	<u>Figure</u>	<u>Page</u>
<u>23</u>	24a: Endoscopic appearance of a carcinoid tumor in the greater curvature of the upper body of the stomach, b: Endoscopic appearance of the carcinoid tumor 6 months after the first endoscopic examination	103
<u>24</u>	Endoscopic photograph shows an ulcerated duodenal mass	103
<u>25.1</u>	A) Sonographic features of a gastric carcinoid B) Color Doppler ultrasound shows the rich vascularity of the tumor C) Contrast-enhanced ultrasound of the tumor also reveals the rich blood perfusion	106
<u>25.2</u>	A) Endoscopic feature of rectal carcinoid B) Endosonography with a miniature ultrasound probe (12 MHz)	107
<u>26</u>	The videocapsule endoscopy detected a stenosing vegetative tumor of the terminal ileum	109
<u>27</u>	Endoscopic image of polyp in small bowel detected on double balloon enteroscopy	110
<u>28</u>	Sigmoidoscopy showing submucosal rectal carcinoid tumor	111
<u>29</u>	Carcinoid tumours of the small bowel	121
<u>30</u>	Treatment algorithm for rectal NETs	124
<u>31</u>	Pre and post treatment magnetic resonance imaging/computed tomography images and baseline ¹¹¹ Inpentetreotide images for a subject with a typical outcome (objectively stable, symptom improvement) and a subject with the optimal outcome(objective response, symptom improvement)	128

☞ List of Figures

<u>No.</u>	<u>Figure</u>	<u>Page</u>
<u>32</u>	(Top) Celiac Angiogram Obtained Prior to Embolization Demonstrates Hepatic Arterial Anatomy With a Patent Right Hepatic Artery (Arrow). (Bottom) A celiac artery angiogram obtained after embolization demonstrates occlusion of the right hepatic artery (arrow)	132

List of Tables

<u>No.</u>	<u>Table</u>	<u>Page</u>
<u>1</u>	Distribution of Carcinoid Tumors by Site	31
<u>2</u>	Characteristics of Gastric Carcinoids by Type	43
<u>3</u>	Carcinoid Tumors (Tumour location - Incidence of metastases - Incidence of Carcinoid syndrome)	60
<u>4</u>	5-year observed survival rates for carcinoid tumors	141



Introduction





Aim of the Work





CHAPTER (1)

**Anatomy of
Gastrointestinal Tract**





CHAPTER (2)

Epidemiology of Carcinoid Tumours





CHAPTER (3)

Pathology and Tumour Histology of Carcinoid Tumours





CHAPTER (4)

Clinical Manifestations of Gastrointestinal Carcinoid Tumors





CHAPTER (5)

Diagnostic procedures for Gastrointestinal Carcinoid Tumors

