

Contents

1.	History and rationale	16
1.1.	History	16
1.2.	Rationale	16
1.3.	References.....	18
2.	Pathophysiological bases of different tumour types with observations of relevance to treatment	20
2.1.	Hepatocellular carcinoma (HCC).....	20
2.1.1.	Epidemiology, pathogenesis and prevention.....	20
2.1.2.	Molecular mechanisms	20
2.1.3.	Screening and diagnosis.....	21
2.1.4.	Staging and prognosis.....	21
2.1.5.	Treatment approaches	21
2.1.5.1.	Percutaneous therapies.....	21
2.1.5.2.	Surgical therapies	21
2.1.5.3.	Systemic therapies	22
2.1.5.4.	Supportive therapies	22
2.2.	Cholangiocarcinoma (CC)	22
2.2.1.	Epidemiology and pathogenesis.....	22
2.2.2.	Therapeutic strategies.....	22
2.3.	Liver metastases in colorectal cancer	24
2.3.1.	Pathobiological features.....	24
2.3.1.1.	Growth factor receptors	24
2.3.1.2.	Angiogenesis.....	25
2.3.1.3.	Cytokines	25
2.3.2.	Therapeutic approaches.....	25
2.3.2.1.	Liver resection.....	25
2.3.2.2.	Extrahepatic metastasis.....	25
2.3.2.3.	Neoadjuvant systemic chemotherapy.....	26
2.3.2.4.	Adjuvant systemic chemotherapy.....	26
2.3.2.5.	Palliative systemic chemotherapy.....	26
2.3.2.6.	Regional transarterial chemotherapy.....	26
2.3.2.7.	Recurrences during follow-up.....	27
2.4.	Liver metastases in neuroendocrine neoplasia	27
2.4.1.	Epidemiology and prognosis	27
2.4.2.	Clinical symptoms and diagnostic investigation	27
2.4.3.	Interdisciplinary therapy.....	27
2.4.3.1.	Differentiated treatment.....	27
2.4.3.2.	Surgery	27
2.4.3.3.	Locoregional therapy.....	28
2.4.3.4.	Drug therapy.....	28
2.4.4.	Follow-up.....	29
2.5.	References.....	29

3	Legal aspects	33
3.1.	Liability for medical malpractice	33
3.1.1.	Medical malpractice	33
3.1.2.	Causality of the malpractice for injury to the patient's life, body or health	34
3.2.	Liability for failure to provide information	35
3.2.1.	Failure to provide information	35
3.2.2.	Causality of failure to provide information for the consent of the patient to treatment	37
3.3.	References from case law and literature	37
4	Materials	40
4.1.	Introduction	40
4.2.	Embolics for TACE in use clinically	40
4.2.1.	Lipiodol – conventional TACE (cTACE)	41
4.2.2.	TACE using particles	41
4.2.3.	Summary	44
4.3.	Alternative procedures for undertaking regional transarterial chemotherapy	44
4.3.1.	Hepato-arterial infusion (HAI)	44
4.3.2.	Arterial port systems	45
4.4.	References	45
5	Hepatocellular carcinoma (HCC)	46
5.1.	Introduction	46
5.2.	Performance and technique of TACE in HCC	46
5.2.1.	Indications and contraindications	46
5.2.2.	Peri-interventional management	47
5.2.3.	Intervention	47
5.2.4.	Side effects	53
5.3.	Study data on the clinical results of TACE in HCC	53
5.3.1.	TACE versus other forms of treatment	54
5.3.2.	Comparison of different TACE procedures	54
5.4.	Combination of transarterial embolisation with systemic or alternative local-ablative procedures	55
5.4.1.	TACE in combination with a systemic approach	55
5.4.2.	Transarterial embolisation in combination with alternative local-ablative procedures	55
5.5.	References	57
6	Intrahepatic cholangiocarcinoma (CC)	59
6.1.	Introduction	59
6.2.	Transarterial therapy	59
6.3.	Transarterial chemoperfusion (TACP) and transarterial chemoembolisation (TACE)	59
6.4.	References	62
7	Liver metastases in colorectal cancer	68
7.1.	Introduction	68
7.2.	Hepatic arterial infusion (HAI)	69

7.3.	Transarterial chemoembolisation (TACE).....	71
7.3.1.	Basis of TACE in liver metastasis in colorectal cancer.....	71
7.3.2.	Results of TACE.....	74
7.4.	References.....	77
8.	Liver metastases in breast cancer	82
8.1.	Introduction.....	82
8.2.	Transarterial tumour therapy of liver metastases in breast cancer.....	82
8.3.	References.....	86
9.	Neuroendocrine liver metastases	87
9.1.	Introduction.....	87
9.2.	Bland Embolisation (BE) for NETLMs.....	87
9.3.	Transarterial chemoembolisation (TACE) for NETLMs.....	88
9.4.	Complications.....	88
9.5.	Follow-up of patients with NETLMs after IR treatments.....	89
9.6.	Prognosis of patients with NETs and liver involvement.....	89
9.7.	New therapeutical options.....	90
9.8.	References.....	90
10.	Liver metastases in malignant melanoma	92
10.1.	Introduction.....	92
10.2.	Treatment options.....	92
10.3.	Chemoembolisation.....	92
10.4.	Drug-eluting beads.....	93
10.5.	Immunoembolisation.....	93
10.6.	Prognostic factors.....	95
10.6.1.	ECOG, LDH value, extent of liver involvement and its response.....	95
10.6.2.	Pattern of growth.....	96
10.6.3.	Genetic abnormalities.....	96
10.7.	References.....	96
11.	Transarterial tumour therapy in rare liver diseases	98
11.1.	Introduction.....	98
11.2.	Haemangiomas.....	98
11.3.	Focal nodular hyperplasia.....	100
11.4.	Hepatocellular adenoma.....	100
11.5.	Gastrointestinal stromal tumours (GIST).....	102
11.6.	Haemangiosarcoma.....	103
11.7.	Adult hepatoblastoma.....	103
11.8.	References.....	103

12.	Prospects and experimental procedures	106
12.1.	Introduction	106
12.2.	Interventional oncologic hybrid treatment of liver metastases	106
12.3.	Clinically relevant innovative embolics and embolisation approaches	107
12.3.1.	Bioresorbable embolics	107
12.3.2.	Multimodal visible embolics	108
12.3.3.	Lyso-thermosensitive liposomal doxorubicin	109
12.3.4.	New drugs for transarterial therapy	110
12.4.	Chemosaturation	112
12.5.	Electrochemotherapy	113
12.6.	Nanoparticle therapy, immunotherapy, viral oncolysis and gene therapy	114
12.6.1.	Nanoparticle therapy	114
12.6.2.	Immunotherapy	115
12.6.3.	Viral oncolysis	115
12.6.4.	Gene therapy	115
12.7.	Intraoperative 3-D imaging for better treatment regulation and monitoring	116
12.8.	References	119
13.	List of abbreviations	121
14.	Index	124