

Contents

Prolog — v

Authors and contributors — xiii

1 Anesthesia and analgesia for thoracic surgery — 1

- 1.1 Introduction — 1
- 1.2 Anesthesia for pediatric thoracic surgery — 1
 - 1.2.1 Neurotoxicity of anesthesia in neonates, infants and young children — 1
 - 1.2.2 Basic anesthetic techniques in pediatric anesthesia — 2
 - 1.2.3 Age at and timing of surgery — 3
 - 1.2.4 Preoperative evaluation and workup — 4
 - 1.2.5 Intraoperative monitoring — 4
 - 1.2.6 Lung isolation and one lung ventilation in children — 5
 - 1.2.7 Anesthetic implications for specific disorders — 13
- 1.3 Perioperative pain management — 24
 - 1.3.1 Systemic analgesia — 25
 - 1.3.2 Local-regional anesthesia — 27
- 1.4 Further reading — 29

2 Approaches to the thoracic cavity — 31

- 2.1 Introduction — 31
- 2.2 Thoracotomy — 31
 - 2.2.1 Anterior thoracotomy — 31
 - 2.2.2 Posterolateral thoracotomy — 32
 - 2.2.3 Lateral muscle sparing thoracotomy (anterolateral/anteroaxillary thoracotomy) — 33
 - 2.2.4 Closure of the thoracotomy with regard to postoperative pain — 34
- 2.3 Sternotomy — 37
 - 2.3.1 Median sternotomy — 37
 - 2.3.2 Partial median sternotomy (hemisternotomy, upper sternotomy) — 39
 - 2.3.3 Closure of the sternotomy — 40
 - 2.3.4 Extended approaches — 40
- 2.4 Video-assisted thoracoscopic surgery (VATS): Development of the operative technique — 41
 - 2.4.1 Introduction — 41
 - 2.4.2 Ventilatory and pathophysiological considerations for VATS — 42
 - 2.4.3 Equipment — 43
 - 2.4.4 Positioning of the patient and trocar introduction — 45
 - 2.4.5 Indications, pros and cons for pediatric VATS — 48
- 2.5 Bronchoscopy — 51

2.5.1	Introduction —	51
2.5.2	Bronchoscopes —	51
2.5.3	Sedation and anesthesia —	52
2.5.4	Diagnostic procedures —	52
2.6	Further reading —	65
3	Bronchopulmonary diseases —	68
3.1	Introduction —	68
3.2	Congenital thoracic malformations —	68
3.2.1	Congenital cystic adenomatoid malformation (CCAM) —	69
3.2.2	Sequestration —	72
3.2.3	Congenital lobar and segmental emphysema —	75
3.2.4	Bronchogenic and foregut duplication cysts —	77
3.2.5	VATS in congenital thoracic malformations —	79
3.3	Airway diseases —	86
3.3.1	Introduction —	86
3.3.2	Laryngotracheal reconstruction —	87
3.3.3	Tracheostomy —	93
3.4	Further reading —	112
4	Lung transplantation —	117
4.1	Introduction —	117
4.2	General considerations —	117
4.3	Indications —	117
4.4	Allocation and size matching —	119
4.5	Surgical technique and lobar transplantation —	119
4.6	Living donation —	121
4.7	Extracorporeal support —	122
4.8	Outcome —	123
4.9	Retransplantation —	124
4.10	Summary —	125
4.11	Further reading —	126
5	Tumors in childhood and adolescence —	128
5.1	Introduction —	128
5.2	Primary lung tumors in childhood and adolescence —	128
5.2.1	General considerations —	128
5.2.2	Bronchial carcinoid tumor —	129
5.2.3	Mucoepidermoid carcinoma of the bronchus —	132
5.2.4	Adenoid cystic carcinoma —	134
5.2.5	Pulmonary blastoma —	134
5.2.6	Bronchioloalveolar carcinoma/adenocarcinoma in situ —	136
5.2.7	Hemangiopericytoma —	137

5.2.8	Inflammatory myofibroblastic tumors —	138
5.2.9	Pulmonary arteriovenous malformations —	140
5.2.10	Hamartoma —	141
5.2.11	Juvenile respiratory papillomatosis —	141
5.3	Chest wall tumors in childhood and adolescence —	142
5.3.1	General considerations —	142
5.3.2	Primitive neuroectodermal tumors (PNETs) —	143
5.3.3	Rhabdomyosarcoma —	144
5.3.4	Osteosarcoma/malignant fibrohistiocytoma —	146
5.3.5	Fibrosarcoma —	146
5.3.6	Hemangiopericytoma —	147
5.3.7	Langerhans cell histiocytosis (LCH) —	147
5.3.8	Lipoblastoma —	148
5.3.9	Mesenchymal hamartoma —	148
5.3.10	Chondroma —	149
5.3.11	Desmoid tumor —	149
5.4	Primary mediastinal tumors in childhood and adolescence —	149
5.4.1	General considerations —	149
5.4.2	Lymphoma —	150
5.4.3	Extragonadal germ cell tumors —	151
5.4.4	Thymoma and thymic carcinoma —	153
5.4.5	Neurogenic tumors —	154
5.5	Further reading —	157
6	Diaphragm —	161
6.1	Introduction —	161
6.2	Congenital diaphragmatic hernia (CDH) —	161
6.2.1	Introduction —	161
6.2.2	Epidemiology of CDH —	162
6.2.3	Pathophysiology of CDH —	162
6.2.4	Prenatal diagnosis —	162
6.2.5	Treatment —	163
6.2.6	Surgical therapy —	164
6.2.7	Long-term follow-up —	168
6.2.8	Implications and future perspectives —	171
6.3	Eventration —	172
6.3.1	Introduction – definition —	172
6.3.2	Etiology, physiopathology —	172
6.3.3	Clinical presentation —	172
6.3.4	Paraclinical investigation —	173
6.3.5	Treatment —	173

6.3.6	Follow-up —	179
6.4	Further reading —	179
7	Thoracic wall —	183
7.1	Introduction —	183
7.2	Pectus excavatum —	183
7.2.1	Indication —	184
7.2.2	Preoperative evaluation —	185
7.2.3	Technique —	185
7.2.4	Postoperative care and follow up —	189
7.2.5	Complications —	190
7.2.6	Removal of the bar(s) —	190
7.3	Pectus carinatum —	198
7.4	Miscellaneous —	205
7.4.1	Poland syndrome —	205
7.4.2	Jeune syndrome —	205
7.4.3	Sternal defects —	206
7.4.4	Defects of the thoracic wall —	206
7.5	Trauma —	208
7.5.1	Introduction —	208
7.5.2	Biomechanics and anatomy —	209
7.5.3	General evaluation and initial management of the child with chest injuries —	209
7.5.4	Airway obstruction —	211
7.5.5	Traumatic asphyxia —	211
7.5.6	Chest wall injuries —	212
7.5.7	Pulmonary injuries —	215
7.5.8	Tracheobronchial injuries —	220
7.5.9	Esophageal injuries —	221
7.5.10	Diaphragmatic injuries —	222
7.5.11	Great vessel injuries —	224
7.5.12	Heart and pericardium —	224
7.5.13	Resuscitative thoracotomy —	226
7.5.14	Pitfalls in pediatric thoracic trauma —	227
7.5.15	Conclusion —	227
7.6	Further reading —	228
8	Miscellaneous infection —	234
8.1	Introduction —	234
8.2	Empyema (including lung abcess) —	234
8.3	Echinococcosis —	241
8.3.1	Introduction —	241

8.3.2	Cystic echinococcosis —	241
8.3.3	Alveolar echinococcosis —	252
8.4	Chylothorax in neonates —	255
8.5	Acquired chylothorax —	257
8.6	Thymus —	260
8.7	Hyperhydrosis —	264
8.7.1	Introduction —	264
8.7.2	Clinical management —	265
8.7.3	Surgical treatment —	269
8.7.4	Conclusions —	273
8.8	Further reading —	275

Index —	281
----------------	------------