

Contents

General Considerations	
1. History of Thoracic Surgery _____	3
<i>Tamás F. Molnár</i>	
2. Thoracic Imaging _____	35
<i>Walter De Wever, Johan Coolen and Johny A. Verschakelen</i>	
1. Introduction _____	35
2. Chest Radiography _____	35
3. Computed Tomography _____	36
4. Magnetic Resonance _____	41
5. Positron Emission Tomography and Integrated Positron Emission Tomography With Computed Tomography _____	42
6. Summary _____	43
3. Endoscopy _____	47
<i>Felix J.F. Herth</i>	
1. Introduction _____	47
2. Flexible Bronchoscopy _____	47
3. Rigid Bronchoscopy _____	51
4. Contraindications for Bronchoscopy _____	52
5. Complications _____	52
6. End Remarks _____	52
4. Preoperative Evaluation _____	55
<i>Alessandro Brunelli</i>	
1. Introduction _____	55
2. Estimation of Cardiac Risk _____	56
3. Predicted Postoperative Forced Expiratory Volume in the First Second _____	57
4. Diffusing Capacity of the Lung for Carbon Monoxide _____	59
5. Exercise Testing _____	60
6. Algorithms _____	64
5. Perioperative Management _____	69
<i>Ayesha S. Bryant and Robert J. Cerfolio</i>	
1. Introduction _____	69
2. Preparation for Surgery _____	69
3. Airway Management _____	71
4. Pain Management _____	73
5. Postoperative Monitoring _____	75
6. Chest Tube Management _____	75
7. Fast-track Recovery _____	75
6. Intensive Care After Thoracic Surgery _____	77
<i>Marc Leone, Pierre Michelet and Gilles Perrin</i>	
1. Introduction _____	77
2. Monitoring of Patient Vital Variables _____	77
3. Pain Monitoring and Control _____	78
4. Sedation and Muscle Paralysis _____	79
5. Fluid Resuscitation and Balance _____	79
6. Vascular and Heart Failure _____	79
7. Management of Respiratory Failure _____	80
8. Sepsis _____	81
9. Renal Failure _____	82
7. Postoperative Complications _____	85
<i>Cengiz Gebitekin, Gonzalo Varela, José Luis Aranda, Ahmet Sami Bayram, Marcelo F. Jiménez and Nuria M. Novoa</i>	
1. Early Postoperative Complications _____	85
2. Delayed Complications in Thoracic Surgery _____	93
8. Principles of Video-assisted Thoracic Surgery _____	119
<i>Gaetano Rocco and Michele Salati</i>	
1. Introduction _____	119
2. Traditional Technical Approach and Instruments _____	119
3. Recent Technical Developments _____	120
9. Quality of Care in Thoracic Surgery _____	123
<i>Alessandro Brunelli, Richard G. Berrisford, Marcel Dahan, Gaetano Rocco, Dirk Van Raemdonck and Gonzalo Varela</i>	
1. Introduction _____	123
2. Data Collection _____	123
3. Selection of Quality Indicators _____	126
4. ESTS Risk Models and Composite Score _____	127
5. Benchmarking Activity and Clinical Accreditation _____	128
6. European Global Quality Initiative: Database, Accreditation and Education _____	130
7. Conclusion _____	132
10. Thoracic Incisions _____	135
10.1. Posterolateral Thoracotomy _____	137
<i>Alberto Oliaro, Enrico Ruffini, Alberto Sandri and Pier Luigi Filosso</i>	
10.2. Anterolateral Thoracotomy _____	143
<i>Michael Rolf Mueller</i>	
10.3. Muscle-sparing Thoracotomy in the Auscultatory Triangle _____	149
<i>Gaetano Rocco</i>	

10.4.	Median Sternotomy	153
	<i>Federico Venuta, Marco Anile, Tiziano De Giacomo and Erino Angelo Rendina</i>	
10.5.	Clamshell Incision	164
	<i>Dan J. Raz and Cameron D. Wright</i>	
10.6.	Hemiclamshell Approach for Thoracic Surgery	168
	<i>Didier Lardinois</i>	
10.7.	Transmanubrial Approach to the Thoracic Inlet	173
	<i>Dominique Grunenwald and Jalal Assouad</i>	
	References	179

Pleura

11.	Anatomy and Physiology of the Pleura	183
	<i>Giuseppe Miserocchi and Egidio Beretta</i>	
1.	Anatomy	183
2.	Physiology	184
3.	Pathophysiology	187
12.	Pneumothorax	193
	<i>Tomasz Grodzki</i>	
1.	Definition	193
2.	Incidence	193
3.	Classification	194
4.	Diagnosis	194
5.	Pathophysiology and Clinical Presentation	194
6.	Treatment	196
7.	Prophylaxis	198
8.	Summary	198
13.	Malignant Pleural Effusion	201
	<i>Michael Rolf Mueller and Markus Marcher</i>	
1.	Definition	201
2.	Epidemiology	201
3.	Prognosis	201
4.	Aetiology and Pathogenesis	202
5.	Diagnosis	202
6.	Management	204
14.	Pleural Empyema and Bronchopleural Fistula	213
	<i>Michel Gonzalez, Jean Yannis Perentes, Thorsten Krueger and Hans-Beat Ris</i>	
1.	Empyema	213
2.	Bronchopleural Fistula	224
15.	Pleural Tumours	233
	<i>Ciaran J. McNamee, Marcelo C. DaSilva, Ann S. Adams, Andrea S. Wolf and David J. Sugarbaker</i>	
1.	Introduction	233
2.	Embryology and Anatomy of the Pleural Space	233
3.	Pathophysiology of the Pleural Space	234
4.	Evaluation of Pleural Diseases	234
5.	Non-neoplastic Pleural Masses	235
6.	Benign Pleural Tumours	235
7.	Pleural Tumours With Possible Malignant Potential	237
8.	Primary Pleural Tumours With Overt Malignant Potential	237
9.	Summary	248

16.	Chylothorax	253
	<i>Andrea Zuin and Federico Rea</i>	
1.	Definition	253
2.	Anatomy and Physiology of the Thoracic Duct	253
3.	Classification, Aetiology and Pathogenesis	255
4.	Clinical Presentation	255
5.	Diagnosis	255
6.	Treatment	257
17.	Pleura – operative techniques	259
17.1.	Pleural Drainage	261
	<i>Jaroslav Kuźdzał</i>	
17.2.	Surgery for Pneumothorax	268
	<i>Giuseppe Cardillo, Gerard Ngome Enang, Francesco Carleo, Luigi Carbone, Marco Di Martino, Roberto Giunti and Massimo Martelli</i>	
17.3.	Accelerated Treatment of Post-pneumonectomy Empyema	271
	<i>Didier Schneiter and Walter Weder</i>	
17.4.	Decortication	276
	<i>Gunda Leschber</i>	
17.5.	Post-pneumonectomy Bronchopleural Fistula: Transsternal Closure	283
	<i>Georgios Stamatis, Kalliopi Athanassiadi and Stefan Welter</i>	
17.6.	Open-window Thoracostomy	287
	<i>Jaroslav Kuźdzał</i>	
17.7.	Post-pneumonectomy Bronchopleural Fistula: Omentoplasty	290
	<i>Jaroslav Kuźdzał</i>	
17.8.	Chronic Pleural Empyema: Myoplasty	295
	<i>Petre V.H. Botianu</i>	
17.9.	Chronic Pleural Empyema: Thoracoplasty	298
	<i>Rajan Santosham and Rajiv Santosham</i>	
17.10.	Extrapleural Pneumonectomy for Malignant Pleural Mesothelioma	303
	<i>Valerie W. Rusch</i>	
17.11.	Pleurectomy/Decortication for Malignant Pleural Mesothelioma	313
	<i>Servet Bölükbas, Michael Eberlein and Joachim Schirren</i>	
17.12.	Thoracic Duct Ligation	320
	<i>Pierre Mordant, Françoise Le Pimpec-Barthes, Alex Arame and Marc Riquet</i>	
	References	328

Trachea

18.	Anatomy and Physiology of the Trachea	333
	<i>Sven Hillinger</i>	
1.	Introduction	333
2.	Extraluminal Anatomy	333
3.	Endoluminal Anatomy	336
4.	Congenital Variants	337
19.	Non-neoplastic Tracheal Stenosis	339
	<i>Piero Zannini</i>	
1.	Introduction	339
2.	Postintubation Tracheal Stenosis	339
3.	Idiopathic Tracheal Stenosis	344
4.	Post-traumatic Tracheal Stenosis	344
5.	Inflammatory and Infectious Tracheal Stenosis	345
6.	Extrinsic Compression	346

20. Congenital Stenosis and Vascular Rings _____	349	2. Components of the Respiratory System	_____	453
<i>Sven Hillinger</i>		3. Ventilation	_____	454
1. Congenital Tracheal Stenosis _____	349	4. Diffusion and Gas Transport	_____	457
2. Vascular Rings _____	352	5. Lung Perfusion	_____	459
21. Tumours of the Trachea _____	359	6. Regional Differences in Ventilation and Perfusion	_____	460
<i>Jimmie Honings and Henning A. Gaissert</i>		7. Mechanics of the Lungs and Chest Wall	_____	461
1. Definition _____	359	8. Control of Breathing	_____	467
2. Classification _____	359	27. Congenital Lung Malformations _____	471	
3. Epidemiology _____	359	<i>Aaron Eckhauser and Thomas Spray</i>		
4. Pathology and Aetiology _____	360	1. Introduction _____	471	
5. Clinical Picture _____	361	2. Embryology _____	471	
6. Diagnosis _____	363	3. Nomenclature _____	472	
7. Treatment _____	365	4. Classification _____	472	
8. Monitoring _____	369	5. Foetal Intervention _____	477	
9. Conclusion _____	369	6. Pulmonary Complications of Cystic Fibrosis	_____	477
22. Tracheomalacia in the Adult _____	373	7. Summary _____	478	
<i>Alessandro Gonfiotti, Massimo Jaus and Paolo Macchiarini</i>		28. Massive Haemoptysis _____	479	
1. Definition _____	373	<i>Akif Turna</i>		
2. Epidemiology _____	373	1. Introduction _____	479	
3. Histopathological Characteristics _____	373	2. Source of Tracheobronchial Haemorrhage	_____	479
4. Pathophysiology _____	374	3. Aetiology _____	480	
5. Symptoms _____	375	4. Diagnosis _____	483	
6. Diagnosis _____	375	5. Treatment _____	486	
7. Classification _____	376	6. Follow-up _____	494	
8. Treatment _____	381	7. Summary _____	494	
9. Conclusions _____	383	29. Chronic Thromboembolic Pulmonary Hypertension _____	497	
23. Acquired Tracheo-oesophageal Fistula _____	387	<i>Patrick Nierlich and Walter Klepetko</i>		
<i>Gabriel Loor, Daniel P. Raymond, Sudish C. Murthy and Thomas W. Rice</i>		1. Introduction _____	497	
1. Background _____	387	2. Clinical Presentation _____	500	
2. Benign Tracheo-oesophageal Fistulas _____	387	3. Diagnostics _____	500	
3. Malignant Tracheo-oesophageal Fistulas _____	392	4. Surgical Technique _____	502	
4. Conclusion _____	395	5. Monitoring, Postoperative Management and Complications	_____	503
24. Trachea – operative techniques _____	399	6. Prognosis _____	503	
24.1. Tracheostomy _____	401	7. Prophylaxis _____	504	
<i>Jean Philippe Avaro, Bastien Orsini and Christophe Doddoli</i>		8. Summary _____	504	
24.2. Bronchoscopic Management of Airway Obstruction _____	406	30. Bullous Disease _____	507	
<i>Leah M. Backhus, Zbigniew Grochowski, Michael S. Mulligan, Jarosław Kuźdzał and Douglas E. Wood</i>		<i>Didier Lardinois</i>		
24.3. Tracheal Resection _____	420	1. Definition _____	507	
<i>Cameron D. Wright</i>		2. Aetiology and Pathophysiology _____	507	
24.4. Subglottic Tracheal Resection _____	428	3. Imaging Studies for the Evaluation of Bullous Disease	_____	507
<i>Ashok Muniappan and Douglas J. Mathisen</i>		4. Surgical Treatment _____	508	
Lung		5. Complications and Outcome _____	509	
25. Anatomy of the Lung _____	437	31. Emphysema _____	511	
<i>Marc Riquet, Alex Arame and Pierre Mordant</i>		<i>Walter Weder and Michaela Horn-Tutic</i>		
1. Surface Anatomy and Landmarks of the Lung _____	437	1. Definition and Pathology _____	511	
2. Bronchial Tree _____	440	2. Diagnosis _____	511	
3. Pulmonary Arterial Tree _____	442	3. Radiology _____	512	
4. Pulmonary Venous System _____	444	4. Epidemiology _____	513	
5. Bronchial Arteries _____	449	5. Aetiology _____	513	
6. Lymph Vessels and Lymph Nodes of the Lungs _____	450	6. Pathophysiology _____	514	
26. Respiratory Physiology _____	453	7. Treatment _____	514	
<i>Walter Vincken</i>		8. Life Expectancy in Emphysema _____	514	
1. Role of the Respiratory System _____	453	32. Bacterial Lung Infections _____	517	
		<i>Andrey Akopov, Vladimir Egorov and József Furák</i>		
		1. Introduction _____	517	

2.	Pneumonia	517	9.	Results	623
3.	Acute Infectious Pulmonary Destruction	519	10.	Complications	625
33.	Bronchiectasis	529	11.	Pre-, Intra- and Postoperative Extracorporeal Support	631
	<i>Khaled M. Al-Kattan and Waleed Saleh</i>		12.	Conclusions and Future Directions	633
1.	Definition	529	38.	Management of Indeterminate Pulmonary Nodule	641
2.	Classification	529		<i>Robert J. Cerfolio and Ayesha S. Bryant</i>	
3.	Epidemiology	530	1.	Definition	641
4.	Pathogenesis	531	2.	Incidence	641
5.	Aetiology	531	3.	Aetiology	641
6.	Clinical Features	533	4.	Diagnostic Evaluation	642
7.	Natural Course	533	5.	Management	642
8.	Diagnosis	533	6.	Follow-up	645
9.	Treatment	535	39.	Benign Tumours of the Lung	647
10.	Prognosis	537		<i>Marcelo F. Jiménez, Nuria M. Novoa, José Luis Aranda, M. Dolores Ludeña and Gonzalo Varela</i>	
11.	Prophylaxis	537	1.	Introduction	647
34.	Mycobacterial Infections	539	2.	Benign Lung Tumours	647
	<i>John A. Odell</i>		3.	Hamartomas of the Lung	649
1.	Introduction	539	4.	Inflammatory Myofibroblastic Tumour	652
2.	Incidence	539	40.	Biology of Lung Cancer	657
3.	Natural History	539		<i>Alykhan S. Nagji and David R. Jones</i>	
4.	Indications and Timing of Surgery for Tuberculosis	540	1.	Introduction	657
5.	Primary Tuberculosis	541	2.	Tumour Development and Growth	657
6.	Secondary Tuberculosis	548	3.	Tumour Metastasis	664
7.	Atypical Mycobacteria and Surgical Treatment	559	4.	Genomics	667
8.	HIV, AIDS and Tuberculosis	559	5.	Epigenetics	668
35.	Mycotic Infections	563	6.	Cancer Stem Cells	669
	<i>Radoslav Jakovic</i>		7.	Conclusion	670
1.	Introduction	563	41.	Epidemiology and Aetiology of Lung Cancer	679
2.	General Principles of Diagnosis	564		<i>Massimo Di Maio, Francesco Perrone, Alessandro Morabito, Antonello La Rocca and Gaetano Rocco</i>	
3.	Histoplasmosis	566	1.	Lung Cancer in the World	679
4.	Aspergillosis	572	2.	Lung Cancer in Europe	679
5.	Coccidioidomycosis	582	3.	Main Risk Factors	681
6.	Blastomycosis	585	4.	Diet and Risk of Lung Cancer	685
7.	Cryptococcosis	586	42.	Pathology of Lung Cancer	689
8.	Zygomycosis	588		<i>Annette Fisseler-Eckhoff, Servet Bölükbas and Joachim Schirren</i>	
9.	Candidiasis	591	1.	Introduction	689
10.	Sporotrichosis	592	2.	Classification of Lung Cancer	689
36.	Parasitic Diseases of the Lung	599	3.	Neuroendocrine Tumours	714
	<i>Semih Halezeröglü, Erdal Okur and Mertol Gökçe</i>		4.	Clinical Aspects of Tumour Location	715
1.	Introduction	599	5.	Practical Aspects of Biopsy Tissue Sampling	716
2.	Hydatid Cyst Disease of the Lung	599	6.	Processing of the Surgical Specimen	720
3.	Pleuropulmonary Amoebiasis	604	7.	The Lung Cancer TNM System	724
4.	Dirofilariasis	605	43.	Lung Cancer Screening	733
5.	Pulmonary Paragonimiasis	606		<i>Ugo Pastorino</i>	
6.	Other Parasitic Diseases of the Lung	607	1.	Background	733
37.	Lung Transplantation	611	2.	Early Trials of Lung Cancer Screening	734
	<i>Dirk Van Raemdonck, Geert M. Verleden, Ivan Bravio, Clemens Aigner, György Lang and Walter Klepetko</i>		3.	Observational Studies With Low-Dose Spiral Computed Tomography	734
1.	Introduction	611	4.	Randomised Trials With Low-Dose Spiral Computed Tomography	735
2.	Current Activities Worldwide	612	5.	Critical Issues in Low-Dose Computed Tomography Screening Trials	738
3.	Indications	612	6.	Conclusions	741
4.	Recipient Selection	612			
5.	Timing of Listing and Organ Allocation	613			
6.	Transplant Procedure	613			
7.	Donor Types, Selection and Management	617			
8.	Lung Preservation	622			

44. Diagnosis and Staging of Lung Cancer	745	2. Classification	825
<i>Ramón Rami-Porta, Sergi Call, Ángel López-Encuentra, Mireia Serra-Mitjans and José Belda-Sanchis</i>		3. Epidemiology	825
1. Introduction	745	4. Aetiology and Pathogenesis	825
2. Diagnosis	746	5. Clinical Presentation	826
3. Staging	754	6. Diagnosis and Staging	827
		7. Treatment	827
		8. Prognosis	830
		9. Prevention	830
45. Principles of the Surgical Treatment of Lung Cancer	775	51. Lung Carcinoid Tumours	833
<i>Eric Lim and Peter Goldstraw</i>		<i>Mariano García-Yuste and José María Matilla</i>	
1. Introduction	775	1. Definition	833
2. Aims of the Surgical Treatment of Lung Cancer	775	2. Incidence	833
3. Selection of Patients for Lung Cancer Surgery	776	3. Classification	833
4. Technique of Lung Cancer Surgery	779	4. Clinical Symptoms	834
5. Audit and Outcomes	780	5. Diagnosis	835
6. Conclusions	780	6. Mediastinal Lymph Node Involvement	835
		7. Treatment	836
46. Mediastinal Lymph Node Dissection	783	52. Bronchial Gland Tumours	841
<i>Hisao Asamura</i>		<i>Anthony Linegar and Richard Schulenburg</i>	
1. Evolution of Lung Cancer Surgery and Mediastinal Lymph Node Dissection	783	1. Introduction	841
2. Definition of Mediastinal Lymph Node Dissection and the Relevant Procedures	783	2. Incidence	841
3. The Lymph Node Map for Lung Cancer	784	3. Clinical Presentation	841
4. Relative Advantages and Disadvantages of Mediastinal Lymph Node Dissection	785	4. Adenoid Cystic Carcinoma	843
		5. Mucoepidermoid Carcinoma	844
		6. Pleomorphic Adenoma	845
		7. Mucous Gland Adenoma	845
		8. Epithelial-Myoepithelial Carcinoma	845
47. Principles of Radiation, Chemotherapy and Biological Therapy for Lung Cancer	791	53. Rare Tumours of the Lung	849
<i>Rafael Rosell, Niki Karachaliou, Teresa Moran, Enric Carcereny, Laura Romero, Florentino Hernando-Trancho, Jia Wei and Bartomeu Massuti</i>		<i>Erino Angelo Rendina, Claudio Andreetti, Camilla Vanni, Mohsen Ibrahim, Cecilia Menna and Federico Venuta</i>	
1. Current Status of Chemotherapy and Radiotherapy in Resected Early Non-small Cell Lung Cancer	791	1. Introduction	849
2. Neoadjuvant Chemotherapy in Early Stage Non-small Cell Lung Cancer	792	2. Pleuropulmonary Blastoma	849
3. Current Status of Radiotherapy in Non-small Cell Lung Cancer	792	3. Primary Pulmonary Carcinosarcoma	850
4. Genetic Determinants of Prognosis in Resected Early Non-small Cell Lung Cancer	793	4. Primary Intrapulmonary Thymoma	850
5. Gene Expression Signatures and Recurrence-free Survival in Early Non-small Cell Lung Cancer	794	5. Primary Malignant Melanoma of the Lung	851
6. Prognostic and Predictive Roles of <i>BRCA1</i>	797	6. Primary Malignant Germ Cell Tumours	851
7. Non-small Cell Lung Cancer With <i>EGFR</i> Mutations	800	7. Primary Sarcoma of the Lung	852
		8. Primary Malignant Lymphoreticular Disorders of the Lung	853
48. Non-resectional Alternatives in Lung Cancer Treatment	805	54. Pulmonary Metastases	857
<i>Inderpal S. Sarkaria, Arjun Pennathur and James D. Luketich</i>		<i>Tom Treasure, Marco Scarci, Peyman Sardari Nia and Ian Hunt</i>	
1. Introduction	805	1. Introduction	857
2. Radiofrequency Ablation	806	2. Biology of Metastases	857
3. Stereotactic Radiosurgery	809	3. Question of the Effectiveness of Metastasectomy	858
4. Cryotherapy	813	4. Clinical Presentation of Pulmonary Metastases	859
5. Final Recommendations	815	5. Is Imaging Sufficiently Sensitive or Must the Lung Always Be Palpated?	859
		6. Factors Associated With a Good Outcome	859
		7. The Role of Lymph Node Dissection	861
		8. Evolving Criteria for Pulmonary Metastasectomy	861
		9. Evidence on Particular Primary Cancer Types	862
49. Strategies for Non-small Cell Lung Cancer Treatment	819	55. Lung – operative techniques	867
<i>Johan F. Vansteenkiste and Isabelle Wauters</i>		55.1. Open Wedge Resection of the Lung	869
1. Introduction	819	<i>Gunda Leschber</i>	
2. Early Stage Non-small Cell Lung Cancer	820	55.2. Videothoracoscopic Wedge Resection	875
3. Locally Advanced Non-small Cell Lung Cancer	821	<i>Gunda Leschber and Gaetano Rocco</i>	
4. Advanced Non-small Cell Lung Cancer	822		
50. Small Cell Lung Cancer	825		
<i>Lorenzo Spaggiari and Francesco Petrella</i>			
1. Definition	825		

55.3.	Open Segmentectomy _____	879	55.14.	Pancoast Tumour: Posterior Approach _____	1006
	<i>Yasuhisa Ohde and Haruhiko Kondo</i>			<i>Pascal A. Thomas</i>	
55.4.	Open Lobectomy _____	890	55.15.	Robotic Lung Lobectomy _____	1013
	<i>Didier Lardinois</i>			<i>Thomas Schmid and Florian Augustin</i>	
55.5.	Bronchial Sleeve Resections _____	913	55.16.	Pulmonary Metastasectomy _____	1021
	<i>Federico Venuta and Erino Angelo Rendina</i>			<i>Gunda Leschber</i>	
55.6.	Videothoroscopic Lobectomy and Bilobectomy _____	922	55.17.	Open Systematic Mediastinal Lymph Node Dissection _____	1027
	<i>Henrik Jessen Hansen and René Horsleben Petersen</i>			<i>Shun-ichi Watanabe and Hisao Asamura</i>	
55.7.	Videothoroscopic Segmentectomy _____	939	55.18.	Videothoroscopic Systematic Mediastinal Lymph Node Dissection _____	1036
	<i>DuyKhanh P. Ceppa, Scott S. Balderson and Thomas A. D'Amico</i>			<i>Hiroaki Nomori</i>	
55.8.	Pneumonectomy _____	947	55.19.	Lung Volume Reduction Surgery _____	1048
	<i>Georgios Stamatis, Stefan Welter, Olaf Mercier, Elie Fadel and Philippe Dartevelle</i>			<i>Leah M. Backhus, Thomas K. Varghese Jr, Michael S. Mulligan and Douglas E. Wood</i>	
55.9.	Transsternal Transpericardial Carinal Resection _____	961	55.20.	Bronchoscopic Lung Volume Reduction _____	1054
	<i>Marc de Perrot, Stephane Collaud and Kazuhiro Yasufuku</i>			<i>Artur Szlubowski</i>	
55.10.	Left Carinal Pneumonectomy _____	969	55.21.	Surgical Technique of Lung Transplantation _____	1063
	<i>Douglas J. Mathisen and Michael Lanuti</i>			<i>Clemens Aigner, Ivan Bravio, Adalet Demir, Ozan Yazar, Dirk Van Raemdonck and Walter Klepetko</i>	
55.11.	Pulmonary Artery Reconstruction _____	975		References _____	1074
	<i>Federico Venuta and Erino Angelo Rendina</i>			Abbreviations _____	1081
55.12.	Extended Pulmonary Resection _____	984			
	<i>Domenico Galetta and Lorenzo Spaggiari</i>				
55.13.	Pancoast Tumour: Cervicothoracic Transmanubrial Approach _____	1000			
	<i>Dominique Grunenwald and Jalal Assouad</i>				