

Table of Contents

| | | |
|--|----|--|
| 1 Examination Technique and Normal Findings | | 1 |
| Radiographic Examination | 2 | Vascular System 20 |
| Frontal Chest Radiograph | 2 | The Mediastinum 24 |
| Lateral Chest Radiograph | 3 | Conventional Tomography 25 |
| Oblique Views | 3 | Computed Tomography 28 |
| Apical Lordotic View | 4 | Radionuclide Imaging 38 |
| Fluoroscopy | 4 | Lung Scintigraphy 38 |
| Scatter-Reduction Grids | 4 | Myocardial Perfusion Scintigraphy 39 |
| The Normal Chest Radiograph | 5 | Positron Emission Tomography (PET) and PET-CT 41 |
| Structures of the Chest Wall | 5 | Ultrasound 42 |
| Diaphragm | 9 | Pulmonary Angiography 42 |
| Pleura | 9 | Bronchography 45 |
| Lung Parenchyma | 16 | Magnetic Resonance Imaging 47 |
| Tracheobronchial System | 18 | |
| 2 Malformations | | 50 |
| Bronchopulmonary Sequestrations | 50 | Congenital Bronchial Atresia 60 |
| Hypogenetic Lung Syndrome (Scimitar Syndrome) | 53 | Vascular Malformations 61 |
| Bronchogenic Cysts | 54 | Pulmonary Arteriovenous Malformations (AVM) 61 |
| Congenital Cystic Adenomatoid Malformation of the Lung (CCAM) | 56 | Partial Anomalous Pulmonary Venous Drainage (PAPVD) 61 |
| Pulmonary Agenesis, Aplasia, and Hypoplasia | 57 | Hypoplasia and Atresia of the Pulmonary Artery 62 |
| Congenital Lobar Emphysema | 59 | |
| 3 Infection and Inflammatory Disorders | | 64 |
| Pneumonia | 64 | Echinococcosis 89 |
| Lung Abscess and Septic Pulmonary Emboli | 69 | Paragonimiasis 90 |
| Pulmonary Tuberculosis | 72 | Ascariasis 90 |
| Fungal Diseases of the Lung | 80 | Strongyloidiasis and Ankylostomiasis 91 |
| Candidiasis | 80 | Sarcoidosis 91 |
| Aspergillosis | 81 | Idiopathic Interstitial Pneumonias 95 |
| Histoplasmosis | 84 | Acquired Immunodeficiency Syndrome 97 |
| Coccidioidomycosis | 84 | Infections 97 |
| Actinomycosis | 85 | Intrathoracic Malignancy 98 |
| Nocardiosis | 85 | Lymphoproliferative Disorders 99 |
| Cryptococcosis (Torulosis) | 86 | Autoimmune Disorders/Connective Tissue Diseases 100 |
| Parasitic Infections | 86 | Systemic Lupus Erythematosus 100 |
| Amebiasis | 86 | Rheumatoid Arthritis 100 |
| Toxoplasmosis | 87 | Progressive Systemic Sclerosis (PSS) 101 |
| Pneumocystis Jiroveci Pneumonia (Previously Known as Pneumocystis Carinii Pneumonia—PCP) | 87 | Sjögren Syndrome 102 |
| Schistosomiasis | 88 | Dermatomyositis 102 |
| | | Ankylosing Spondylitis (AS) 102 |

| | | | |
|---|-----|---|-----|
| Wegener Granulomatosis (WG) | 103 | Pulmonary Eosinophilia | |
| Allergic Angiitis and Granulomatosis | | (Eosinophilic Lung Disease) | 106 |
| (Churg–Strauss Disease) | 103 | Radiation-Induced Lung Disease | 107 |
| Antiglomerular Basement Membrane Disease | | Drug-Induced Lung Disease | 108 |
| (AGBMD) | 105 | | |
| Idiopathic Pulmonary Hemosiderosis (IPH) | 105 | | |

4 Chronic Obstructive Pulmonary Disease and Diseases of the Airways

110

| | | | |
|---|-----|---|-----|
| Emphysema | 110 | Cellular Bronchiolitis | 122 |
| Other Forms of Emphysema | 114 | Constrictive Bronchiolitis | 123 |
| Cicatricial Emphysema | 114 | Swyer–James–Macleod Syndrome | 123 |
| Bullous Emphysema | 115 | Organizing Pneumonia/Cryptogenic Organizing | |
| Compensatory Emphysema | 115 | Pneumonia (also known as Bronchiolitis | |
| Chronic Bronchitis | 116 | Obliterans Organizing Pneumonia) | 124 |
| Bronchiectasis | 117 | Bronchial Asthma | 125 |
| Bronchiolitis-Small Airway Disease | 122 | | |

5 Inhalational Lung Diseases and Pneumoconioses

126

| | | | |
|--|-----|--|-----|
| Foreign Body Aspiration | 126 | Other Inorganic Pneumoconioses | 144 |
| Pneumoconiosis | 128 | Extrinsic Allergic Alveolitis (EAA)/ | |
| Pneumoconioses Due to Inorganic Dusts | 136 | Hypersensitivity pneumonitis | 145 |
| Silicosis | 136 | Inhalation of Toxic Gases and Fumes | 147 |
| Coal-Worker's Pneumoconiosis (CWP) | 140 | | |
| Asbestos-Induced Pleural Changes and | | | |
| Asbestosis | 140 | | |

6 Tumors and Tumor-Like Lesions of the Lung

149

| | | | |
|--|-----|-----------------------------------|-----|
| The Solitary Pulmonary Nodule (SPN) | 149 | Pulmonary Metastases | 172 |
| Benign Tumors of the Lung | 150 | Lymphoma | 178 |
| Pulmonary Hamartoma | 151 | Primary Pulmonary Lymphoma | 181 |
| Carcinoid, Mucoepidermoid, and Adenoid | | AIDS-Related Lymphoma | 181 |
| Cystic Carcinoma | 152 | Lymphomatoid Granulomatosis | 181 |
| Langerhans Cell Histiocytosis (LCH) | 154 | Treated Lymphoma | 181 |
| Bronchial Carcinoma | 157 | | |

7 Pulmonary Hypertension and Edema

183

| | | | |
|--|-----|---|-----|
| Pulmonary Hypertension | 183 | Cardiac Defects with a Left-to-Right Shunt | 193 |
| Precapillary Pulmonary Hypertension | 184 | Pulmonary Hypertension Due to Alveolar | |
| Primary Pulmonary Hypertension | 184 | Hypoventilation | 194 |
| Acute Pulmonary Embolism (PE) and Chronic | | Postcapillary Pulmonary Hypertension | 195 |
| Thromboembolic Pulmonary | | Pulmonary Veno-Occlusive Disease | 195 |
| Hypertension (CTEPH) | 187 | Pulmonary Congestion and Edema | 195 |

| | |
|--|-----|
| 8 Thoracic Trauma | 200 |
| Chest Wall Injuries | 200 |
| Rib Fractures | 200 |
| Sternal Fractures | 200 |
| Vertebral Fractures | 201 |
| Subcutaneous Emphysema | 202 |
| Pleural Injuries | 203 |
| Pneumothorax | 203 |
| Hemothorax | 205 |
| Pulmonary Parenchymal Trauma | 205 |
| Pulmonary Contusion | 205 |
| Pulmonary Hematomata and Pneumatocoles .. | 206 |
| Pulmonary Atelectasis | 207 |
| Pneumonia in the Trauma Patient | 207 |
| Tracheobronchial Rupture | 207 |
| Pulmonary Torsion | 207 |
| Adult Respiratory Distress Syndrome (Shock Lung, Da Nang Syndrome, Stiff Lung Syndrome, Oxygen Lung, Transfusion Lung) | 208 |
| Mediastinal Injuries | 210 |
| Pneumomediastinum | 210 |
| Traumatic Aortic and Great Vessel Injury | 211 |
| Traumatic Diaphragmatic Rupture | 212 |
| | |
| 9 Diseases of the Pleura, Diaphragm, and Chest Wall | 214 |
| Diseases of the Pleura | 214 |
| Pleural Effusion | 214 |
| Pneumothorax | 220 |
| Pleural Thickening and Fibrothorax | 222 |
| Fibrothorax and Asbestos-Induced Diffuse Pleural Thickening | 224 |
| Pleural Mesothelioma | 225 |
| Diseases of the Diaphragm | 228 |
| Diaphragmatic Paralysis | 229 |
| Subphrenic Abscess | 229 |
| Diaphragmatic Hernia | 231 |
| Bochdalek Hernia | 231 |
| Morgagni Hernia | 232 |
| Hiatus Hernia | 232 |
| Tumors of the Diaphragm | 234 |
| | |
| Diseases of the Chest Wall | 234 |
| | |
| 10 Radiology of Cardiac Disease | 240 |
| Cardiac Size | 240 |
| Cardiac Contour | 240 |
| Congenital Heart Disease | 243 |
| Cardiac Anomalies without a Shunt | 243 |
| Pulmonary Stenosis | 243 |
| Congenital Aortic Stenosis | 244 |
| Coarctation of the Aorta | 244 |
| Congenital Cardiac Anomalies Associated with a Left-to-Right Shunt | 247 |
| Atrial Septal Defect | 248 |
| Ventricular Septal Defect | 250 |
| Patent Ductus Arteriosus | 250 |
| Total Anomalous Pulmonary Venous Drainage (TAPVD) | 251 |
| Congenital Cardiac Anomalies associated with a Right-to-Left Shunt | 253 |
| Tetralogy of Fallot | 253 |
| Uncorrected Transposition of the Great Vessels | 254 |
| Ebstein Anomaly | 254 |
| Acquired Heart Disease | 255 |
| Cardiac Failure | 255 |
| Ischemic Heart Disease (IHD) and Myocardial Infarction (MI) | 256 |
| Cardiomyopathies | 261 |
| Acquired Valvular Heart Disease | 262 |
| Mitral Stenosis | 262 |
| Mitral Regurgitation | 263 |
| Aortic Stenosis | 267 |
| Aortic Regurgitation | 268 |
| Multivalvular Disease | 268 |
| Hypertensive Heart Disease | 269 |
| Cardiac Neoplasms | 269 |
| Imaging the Heart Post-Intervention and Surgery .. | 269 |
| Cardiac Pacemakers | 269 |
| Coronary Artery Bypass Graft (CABG) Surgery .. | 270 |
| Coronary Stents | 271 |
| Pericardial Disease | 272 |
| Pericardial Effusion | 272 |
| Prosthetic Heart Valves | 272 |
| Constrictive Pericarditis | 272 |
| Pericardial Cysts and Diverticula | 273 |

| | |
|--|---------|
| 11 Diseases of the Mediastinum | 274 |
| <hr/> | |
| Mediastinal Displacement | 274 |
| Air in the Mediastinum | 274 |
| Air in the Esophagus and Stomach | 274 |
| Pneumomediastinum | 274 |
| Non-Neoplastic Mediastinal Widening | 276 |
| Acute Mediastinitis | 276 |
| Diseases of the Thoracic Aorta | 276 |
| Chronic Mediastinitis | 276 |
| Aortic Anomalies | 276 |
| Aortic Ectasia | 278 |
| Aortitis | 284 |
| Mediastinal Hematoma | 284 |
| Neoplastic Mediastinal Widening | 285 |
| The Thymus | 288 |
| Mediastinal Lymph Node Enlargement | 290 |
| Primary Mediastinal Tumors: Benign Teratoma and Malignant Germ Cell Tumors | 290 |
| Neurogenic Tumors | 291 |
| 12 High-Resolution/Thin-Section CT Patterns in Pulmonary Disease | 293 |
| <hr/> | |
| Ground-Glass Opacification—Consolidation | 293 |
| Multifocal Peribronchial Consolidation | 294 |
| Pulmonary Nodules | 295 |
| Intra- and Interlobular Septal Thickening and Reticular Pattern | 296 |
| Decreased Lung Attenuation and Cystic Lung Change | 297 |
| Inhomogeneous-Mosaic Lung Attenuation | 299 |
| 13 Radiographic Signs and Differential Diagnosis | 301 |
| <hr/> | |
| 1. The Opaque Hemithorax | 301 |
| 2. Lobar and Segmental Opacification | 304 |
| 3. Opacification which does not Conform to Anatomic Boundaries | 310 |
| Inhomogeneous and Regionally Confluent Air Space Opacification | 310 |
| Bilateral Symmetric Hazy Opacification | 312 |
| 4. Opacification involving the Upper Zone and/or Apicomediastinal Angle | 315 |
| 5. Lower Lung and Cardiophrenic Angle Opacification | 318 |
| 6. Pulmonary Nodules | 320 |
| 7. Linear Shadowing | 324 |
| 8. Reticular Shadowing | 328 |
| 9. Cavitating Lung Lesions | 332 |
| 10. Ring Shadows and Cystic Lung Disease | 334 |
| 11. Pulmonary Hypertransradiancy | 337 |
| 12. Hilar Enlargement | 341 |
| 13. Intrathoracic Calcifications | 344 |
| Pulmonary Calcifications | 345 |
| Tracheobronchial Calcifications | 347 |
| Lymph Node Calcification | 348 |
| Pleural Calcifications | 348 |
| 14 Thoracic Intervention | 349 |
| <hr/> | |
| Biopsy | 349 |
| Drainage | 350 |
| Foreign Body Retrieval-Extraction | 351 |
| Bronchial Artery Embolization | 352 |
| Coil Embolization of Pulmonary Arteriovenous Malformations | 354 |
| Coil Embolization of Pulmonary Artery False Aneurysms | 355 |
| Reference List | 357 |
| <hr/> | |
| Index | 369 |
| <hr/> | |