

# THE ROLE OF MULTI-DETECTOR CT PULMONARY ANGIOGRAPHY IN PULMONARY VASCULAR DISORDERS

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# ABSTRACT

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**Introduction:** Multi-detector pulmonary CT angiography is now the first line of investigation in the diagnosis of most of the pulmonary vascular disorders. The increase in gantry speed and thinner collimation that accompanied the introduction of multidetector CT scanners has extended the accuracy of assessment of the pulmonary vasculature to the subsegmental level. **Purpose:** The aim of this study is to demonstrate the role of MDCT pulmonary angiography in the diagnosis of different pulmonary vascular disorders. **Patients and methods:** 50 patients were examined using a 4-multidetector CT scanner in the radiology department in Cairo University. The study population was divided into 3 groups. Group A including 29 patients clinically suspected with pulmonary embolism. Group B including 12 patients diagnosed with pulmonary hypertension upon echocardiographic basis. Group C including the last 11 patients having other pulmonary vascular disorders as pulmonary artery aneurysms, congenital anomalies and pre-operative assessment of neoplastic lesions. **Results:** Group A showed 69% of the patients having pulmonary embolism and 27.5% showing embolic filling defects at the subsegmental level. Group B showed dilated pulmonary artery in all patients, right ventricular enlargement in 33.3% of cases, and dilated bronchial and non-bronchial vessels in 25% of cases. Group c showed a variety of other pulmonary vascular disorders as pulmonary artery aneurysms, congenital absence of the pulmonary artery, Macleod's syndrome, pulmonary AVM (showing the hypertrophied feeding vessels), and pre-operative assessment of a neoplastic hilar mass shown to be irresectable. **Conclusion:** MDCT pulmonary angiography is a relatively available, minimally invasive investigation that can now be considered as the first line of investigation in diagnosis of pulmonary embolism with its ability to detect small emboli down to the segmental and subsegmental level. It is of value in patients with pulmonary hypertension as it shows different signs of pulmonary hypertension as well as the possible cause. In most cases of congenital anomalies and pulmonary aneurysms pulmonary CTA provides the needed data for management in such cases.

**KEYWORDS:** CT pulmonary angiography (CTPA) - pulmonary vascular disorders - pulmonary embolism (PE) - pulmonary hypertension.

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# TABLE OF CONTENTS

---

<b>Introduction</b>	<b>1</b>
<b><i>Review of literature</i> -----</b>	<b><i>3</i></b>
<b>Pulmonary Vascular Anatomy</b>	<b>3</b>
Pulmonary Artery	3
Pulmonary Veins	7
Anatomy of the bronchial artery	8
<b>MDCT Findings of Different Pulmonary Vascular Disorders</b>	<b>12</b>
I. Pulmonary embolism	13
II. Pulmonary Hypertension	47
III. Pulmonary Arterial and Venous Anomalies	62
IV. Decreased Pulmonary Artery Diameter	65
V. Increased Pulmonary Artery Diameter	69
VI. VII. Congenital anomalies of the pulmonary arteries and veins	74
<b>Technique of pulmonary MSCTA</b>	<b>94</b>
Technical procedures	94
<b><i>Patients And Methods</i>-----</b>	<b><i>106</i></b>
Pulmonary CT Angiography technique:	108
<b><i>Results</i> -----</b>	<b><i>112</i></b>
<b><i>Case Presentation</i>-----</b>	<b><i>120</i></b>
<b><i>Discussion</i> -----</b>	<b><i>162</i></b>
<b><i>Summary &amp; Conclusion</i>-----</b>	<b><i>173</i></b>
<b><i>References</i> -----</b>	<b><i>174</i></b>

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# LIST OF ABBREVIATIONS

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2D	two dimensional
3D	three dimensional
ACS	acute coronary syndrome
AD	aortic dissection
APAH	associated pulmonary arterial hypertension
AVM	arteriovenous malformation
COPD	chronic obstructive pulmonary disease
CPR	curved planar reconstruction
CREST	calcinosis, Raynaud's, oesophageal dysmotility, sclerodactyly, telangiectasia
CTEPH	chronic thrombo-embolic pulmonary hypertension
CTPA	computed tomography of pulmonary angiography
DSPA	digital subtraction pulmonary angiography
DVT	deep venous thrombosis
ECG	electrocardiogram
F4	Fallot's tetralogy
FOV	field of view
FPAH	familial pulmonary arterial hypertension
HIV	human immune deficiency virus
HU	Hounsfield unit
ICBT	intercostobronchial trunk
ICU	intensive care unit
IPAH	idiopathic pulmonary arterial hypertension
IVC	inferior vena cava
LV	left ventricle
MDCTPA	multidetector computed tomography of pulmonary angiography
MIP	maximum intensity projection
MPR	multiplanar reconstruction
PA	pulmonary artery
PACS	picture archiving and communication system
PAH	pulmonary arterial hypertension
PAVM	pulmonary arteriovenous malformation

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PCH	Pulmonary capillary hemangiomatosis
PCTA	pulmonary computed tomography angiography
PE	pulmonary embolism
PH	pulmonary hypertension
PIOPED	prospective investigation of pulmonary embolism diagnosis
PMRA	pulmonary magnetic resonance angiography
POVD	pulmonary veno-occlusive disease
PPH	primary pulmonary hypertension
RA	right atrium
ROI	region of interest
RV	right ventricle
SOB	shortness of breath
SPAH	secondary pulmonary arterial hypertension
SSD	shaded surface display
SVC	superior vena cava
V/Q	ventilation-perfusion scan
VR	volume rendering
VSD	ventricular septal defect
WHO	world health organization

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# LIST OF FIGURES & TABLES

---

- Fig. 1: Axial CT scan showing the main pulmonary artery branching into right and left branches (Goo et al., 2003). ----- 4
- Fig. 2 a,b: Axial CT showing normal right and left pulmonary arteries ----- 5  
(Goo et al., 2003). ----- 5
- Fig. 3 a,b: Normal pulmonary arteries. Curved planar reformatted images show the right (a) and left (b) pulmonary arteries, along with the outlet portion of the right ventricle and the main pulmonary artery (Goo et al., 2003). ----- 5
- Fig. 4: Cross-sectional drawings depict normal pulmonary vascular anatomy. Arterial vessels are located adjacent to a schematic airway (A). The walls of elastic arteries (a) contain multiple parallel elastic lamellae, smooth muscle cells, and collagen fibrils. The muscular arteries (b) contain a media of smooth muscle fibers, bordered by distinct internal and external elastic laminae. Arterioles (c) are distinguished by the absence of a distinct external elastic lamina. Veins (d) are identified by their septal location (S) and a media of loosely organized smooth muscle fibers (Frazier et al., 2000). ----- 7
- Fig. 5: Normal pulmonary veins. CT scan shows all the pulmonary veins, including the right superior (RS), right inferior (RI), left superior (LS), and left inferior (LI) pulmonary veins, with a normal veno-atrial connection with the left atrium (Goo et al., 2003). ----- 7
- Fig. 6: a) Left anterior oblique volume-rendered CT image shows the superior and inferior pulmonary veins (short straight arrows) draining medially under the main pulmonary artery (long straight arrow) and aortic arch (curved arrow). (b) Right lateral volume-rendered CT image shows the right superior and inferior pulmonary veins (short arrows) behind the SVC (long arrow). (c) Posterior volume-rendered CT image shows the pulmonary veins (thick straight arrows) entering the left atrium (curved arrow). Note the relationship to the pulmonary arteries (thin straight arrows) (Lawler et al., 2002). ----- 8
- Fig. 7: Diagrams illustrate the types of bronchial arterial supply: Type I, two bronchial arteries on the left and one on the right that manifests as an ICBT (40% of cases); Type II, one on the left and one ICBT on the right (21%); Type III, two on the left and two on the right (one ICBT and one bronchial artery) (20%); and Type IV, one on the left and two on the right (one ICBT and one bronchial artery) (9.7%) (Yoon et al., 2002). ----- 9
- Fig. 8: Schematic illustrates how the bronchial arteries (ba) supply the visceral pleura, airways, vasa vasora of pulmonary arteries, lymph nodes, and bronchovascular and neural bundles. Extrapulmonary bronchial veins (ev) drain to the right side of the heart, and intrapulmonary veins (iv) anastomose with pulmonary arteries and return to the left side of the heart (Frazier et al., 2000). ----- 10
- Fig. 9: 22-year-old woman with cystic fibrosis and recurrent moderate hemoptysis originating from the right upper lobe. Volume-rendered CT image of thoracic vessels and posterior bone structures shows an enlarged right bronchial artery (arrows)

---

originating from a right intercosto- bronchial trunk, with a tortuous mediastinal course (Remy-Jardin et al., 2004).----- 11

Fig. 10: Acute occlusive pulmonary embolism in a 32-year-old woman who presented with chest pain. CT scan shows a pulmonary embolus within the posterobasal segment of the right lower lobe artery (arrow). The artery is enlarged compared with adjacent patent vessels (Wittram et al., 2004). ----- 15

Fig. 11 a,b: Acute pulmonary embolism in a 45-year-old woman who presented with chest pain. (a) CT scan shows a pulmonary embolus that affects the segmental artery of the laterobasal segment of the right lower lobe. This partial filling defect surrounded by contrast material produces the polo mint sign (arrow). (b) CT scan shows acute emboli that affect subsegmental arteries of the laterobasal segment (arrows) (Wittram et al., 2004). ----- 15

Fig. 12: Acute pulmonary embolism in a 66-year-old man who presented with chest pain and dyspnea. CT scan shows an acute pulmonary embolus that causes a partial filling defect surrounded by contrast material (railway track sign) (arrow). Another acute pulmonary embolus affects the left main pulmonary artery (arrowhead) (Wittram et al., 2004). ----- 15

Fig. 13: Acute pulmonary embolism in a 58-year-old woman who presented with chest pain and dyspnea. CT scan demonstrates a pulmonary embolus that results in an eccentrically positioned partial filling defect, which is surrounded by contrast material and forms acute angles with the arterial wall (arrows) (Wittram et al., 2004).----- 16

Fig. 14: Acute pulmonary embolism in a 58-year-old woman who presented with chest pain and dyspnea. CT scan shows an acute pulmonary embolus with ancillary findings of a peripheral wedge-shaped area of consolidation (hyperattenuation) in the lung (arrow), a finding that may represent an infarct, as well as a linear band (arrowhead) (Wittram et al., 2004).----- 16

Fig. 15 a, b: Acute pulmonary thromboembolism in a 32-year-old woman with severe dyspnea. (a) Contrast-enhanced CT scan shows significant bilateral partial filling defects in peripheral segments of both interlobar arteries (arrowheads). In the right interlobar artery, the filling defect results in the "railway track" sign. In the left interlobar artery, the partial filling defect and surrounding area of contrast enhancement form acute angles with the arterial wall. (b) Contrast-enhanced CT scan at the level of the lower lobes shows peripheral triangular nonenhanced densities (arrows), suggestive of infarcts or hemorrhage, and some peripheral areas with enhancement (white arrowhead) suggestive of atelectasis. The short axis (black line) of the right ventricle (RV) is wider than that of the left ventricle (LV), and mild displacement of the interventricular septa (black arrowheads) is visible. These abnormalities suggest right ventricular strain (Castaner et al., 2006). ----- 18

Fig. 16a,b: Acute central pulmonary embolism in an asymptomatic 87-year-old woman.(a) Unenhanced CT scan demonstrates subtle regions of hyperattenuation (arrow). (b) Confirmatory CT pulmonary angiogram demonstrates acute pulmonary embolism within the right main and left interlobar pulmonary arteries (Wittram et al., 2004). ----- 19



- Fig. 17: Chronic pulmonary embolism in a 27-year-old man with dyspnea. CT scan shows complete occlusion of vessels in the right lung (arrowheads) that are smaller than adjacent patent vessels. Note the collateral blood supply from a branch of the right hemidiaphragmatic artery (arrow) (Wittram et al., 2004). ----- 21
- Fig. 18: Chronic pulmonary embolism in a 62-year-old man with dyspnea. CT scan shows an eccentrically located thrombus that forms obtuse angles with the vessel wall (arrows). Note the dilated collateral bronchial artery (arrowhead) (Wittram et al., 2004). ----- 21
- Fig. 19: Chronic pulmonary embolism in the same patient as in Fig. 18. CT scan reveals a small, recanalized pulmonary artery with contrast material in the central lumen (arrow) (Wittram et al., 2004).----- 21
- Fig. 20: Chronic pulmonary embolism in a 56-year-old man with dyspnea. CT scan shows a flap (arrow) within a small right interlobar pulmonary artery. Collateral bronchial artery dilatation is also noted (arrowhead) (Wittram et al., 2004).----- 22
- Fig. 21: Chronic thromboembolic pulmonary hypertension in a 62-year-old man with dyspnea. Contrast-enhanced CT scan shows enlargement of left (black arrowhead) and right (white arrowhead) bronchial arteries, as well as filling defects in the right upper lobe pulmonary vessels (arrows) that correspond to new locations of acute pulmonary thromboembolism (Castaner et al., 2006).----- 22
- Fig. 22: Chronic pulmonary embolism in the same patient as in Fig. 21. CT scan shows a large chronic pulmonary embolus in the main and left main pulmonary arteries (arrowhead). Arrows indicate collateral bronchial arteries (Wittram et al., 2004). ----- 23
- Fig. 23: Chronic pulmonary embolism in a 60-year-old woman with dyspnea. CT scan demonstrates a mosaic perfusion pattern. The dark regions of underperfused lung are seen to contain vessels (arrows) that are smaller than the adjacent patent vessels in the normally perfused lung (Wittram et al., 2004). ----- 23
- Fig. 24: Septic pulmonary embolism in a 28-year-old intravenous drug abuser with human immunodeficiency viral infection. Repeated blood cultures disclosed a positive culture for *Nocardia*. CT scan (10-mm collimation) obtained at the level of the azygos arch demonstrates the feeding vessel sign (vessel leading directly to the nodule) in several nodules (arrows) (Han et al., 2003). ----- 24
- Fig. 25: Pulmonary hydatid embolism caused by rupture of a mediastinal hydatid cyst into the right pulmonary artery in a 22-year-old woman. The patient underwent pulmonary transplantation due to severe pulmonary arterial hypertension. CT scan (5-mm collimation, lung window) obtained at the level of the left inferior pulmonary vein shows enlarged branches of the pulmonary arteries in the bilateral lower lung zones (arrows) (Han et al., 2003). ----- 25
- Fig. 26: Tumor embolism from cholangiocarcinoma in a 62-year-old man. Thin-section (1.5-mm collimation) CT scan obtained at the level of the basal segmental bronchi shows a pleura-based, wedge-shaped area of high attenuation (large arrows) and numerous nodules, some of which demonstrate tree-in-bud appearance (small arrows) (Han et al., 2003). ----- 27

- Fig. 27: Pulmonary tumor thrombotic microangiopathy caused by metastatic gastric carcinoma in a 57-year-old man. Thin-section (1.5-mm collimation) CT scan obtained at the level of the left basal trunk shows multifocal tree-in-bud appearances (arrows) caused by tumor emboli (Han et al., 2003). ----- 27
- Fig. 28: Incidentally found air embolism in an asymptomatic 59-year-old man. Routine contrast-enhanced chest CT scan (5-mm collimation) shows two small air bubbles in the main pulmonary artery (arrows) (Han et al., 2003).----- 28
- Fig. 29 a,b: (a) Talc embolism in a 26-year-old woman. The patient had a 4-year history of heroin and methadone abuse. Thin-section (1.5-mm collimation) CT scan (mediastinal window) obtained at the subcarinal level shows coalescent areas of increased attenuation (progressive massive fibrosis) posteriorly in both lungs. Note also the areas of high attenuation within the masses (arrow), a finding that suggests talc deposition. (b) Talc embolism in a 37-year-old male drug abuser. Thin-section (1.5-mm collimation) CT scan obtained at the level of the left interlobar artery shows diffuse pulmonary involvement with ill-defined centrilobular small nodules (arrows). Note also the nodular branching structures (tree-in-bud appearance) (Han et al., 2003). ----- 29
- Fig. 30 a,b: Respiratory motion artifact in a 61-year-old man with dyspnea. (a) CT scan (lung window) shows composite images of vessels (seagull sign) (arrows). (b) CT scan (mediastinal window) demonstrates a low-attenuation abnormality caused by partial volume averaging of vessel and adjacent lung (arrow), a finding that can simulate pulmonary embolism (Wittram et al., 2004).----- 32
- Fig. 31: Image noise in scans of a 39-year-old woman with chest pain. CT scan clearly depicts image noise pixels within the contrast material-filled heart chambers, a confluence of which could be misinterpreted as pulmonary embolism (arrow). Unlike true emboli, however, these apparent abnormalities are not well-defined filling defects. Small pulmonary emboli could be obscured by a large amount of image noise (Wittram et al., 2004). ----- 33
- Fig. 32 a,b: Beam-hardening artifact in a 63-year-old man with respiratory failure. (a) On a CT scan, a pulmonary artery catheter causes adjacent beam-hardening artifacts within the main and right pulmonary arteries that mimic pulmonary embolism (arrows). Small pulmonary emboli are noted in the left pulmonary artery. (b) CT scan produced with bone window settings clearly depicts the pulmonary artery catheter. Adjacent beam-hardening artifacts are also seen (Wittram et al., 2004).----- 33
- Fig. 33: Flow-related artifact in a 60-year-old woman with pleuritic chest pain. Coronal reformatted image of the right interlobar artery and the posterobasal segment of the pulmonary artery demonstrates dense contrast material superior and inferior to a region of poorly enhanced blood (arrow) (Wittram et al., 2004).----- 34
- Fig. 34 a,b: Flow-related artifact in a 73-year-old woman with chest pain. (a) CT scan shows poor enhancement of the interlobar and middle lobe pulmonary arteries due to flow-related artifact. More distally, the pulmonary arteries were well enhanced. Note also the fluid-filled, dilated esophagus. (b) Repeat CT pulmonary angiogram demonstrates segmental pulmonary emboli within the medial and lateral segmental branches of the middle lobe artery (arrows) (Wittram et al., 2004). ----- 35

---

Fig. 35 a,b,c: Acute pulmonary embolism in a 59-year-old man. (a) CT scan (window width = 400 HU, window level = 40 HU) demonstrates thrombus within the right interlobar artery (arrow). (b) CT scan (window width = 552 HU, window level = 276 HU) shows acute pulmonary embolism within the medial segment of the middle lobe artery (arrow) that was missed on the image in a. The window width is equal to the mean attenuation of the main pulmonary artery plus two standard deviations, and the window level equals one-half of this value. (c) CT scan (window width = 700 HU, window level = 100 HU) gives better demonstration of both thrombi within the right interlobar artery and the medial segment of the middle lobe artery (Wittram et al., 2004).

----- 36

Fig. 36: Streak artifact in a 35-year-old woman with chest pain. CT scan shows streak artifact from dense contrast material within the superior vena cava (arrows). The artifact can be recognized by its non-anatomic, radiating nature (Wittram et al., 2004). 36

Fig. 37 a,b: Lung algorithm artifact in a 70-year-old woman with dyspnea. (a) CT scan obtained with an edge-enhancing algorithm shows a lung algorithm artifact that mimics acute pulmonary embolism (arrows). (b) CT scan obtained with the standard algorithm does not demonstrate this artifact. No embolism was present (Wittram et al., 2004). --- 37

Fig. 38a,b: Partial volume artifact in a 52-year-old woman with dyspnea. (a) On a 3.75-mm-thick CT scan, partial volume averaging of vessel and lung creates an artifact that mimics pulmonary embolism within the anterior segment of the left upper lobe pulmonary artery (arrow). The apparent pulmonary embolism is ill defined. (b) Contiguous CT scan obtained immediately superior to a demonstrates a contrast material-filled pulmonary artery, a finding that confirms that the low attenuation seen in a was due to partial volume artifact (Wittram et al., 2004). ----- 38

Fig. 39: Stair step artifact in an 84-year-old man with dyspnea and chest pain. CT scan shows low-attenuation lines that traverse a vessel on coronal reformatted images (arrows). This artifact can be recognized by its non-anatomic nature and is easily distinguished from pulmonary embolism (Wittram et al., 2004). ----- 39

Fig. 40a,b: Contrast-enhanced retrospective ECG-gated 16-detector row pulmonary CT angiography study in a 35-year-old man suspected of having PE. Sagittal volume-rendered images show paracardiac pulmonary vessels in left lower lung lobe. (a) During systole, severe stair-step artifacts (arrows) occur along the course of pulmonary vessels owing to transmitted cardiac motion. (b) During diastole, cardiac pulsation artifacts are substantially reduced, and almost motion-free depiction of paracardiac pulmonary vessels (arrows) can be achieved (Schoepf and Costello, 2004). ----- 39

Fig. 41a,b: Contrast-enhanced pulmonary CT angiography in a 43-year-old woman suspected of having acute PE. Lymphatic tissue (arrows) in mediastinum and pulmonary hilum may be misinterpreted as embolic filling defects in central pulmonary vessels by less experienced observers if (a) transverse sections alone are used for diagnosis, while (b) coronal multiplanar reformations from four-detector row CT allow better differentiation of lymphatic tissue and vessels and may reduce sources of diagnostic error (Schoepf and Costello, 2004). ----- 40

Fig. 42: CT scan shows the vascular bifurcation between the left lower lobe and lingular arteries as a curved line surrounded by contrast material (arrow). Contiguous images demonstrated the true nature of this finding (Wittram et al., 2004). ----- 40

---

Fig. 43: CT scan shows unenhanced pulmonary veins (arrows), which can mimic complete occlusive pulmonary embolism. However, this pitfall can be recognized by observing veins on contiguous images to the level of the left atrium (Wittram et al., 2004).----- 41

Fig. 44: Mucus plugs in an 83-year-old woman with dyspnea. CT scan shows mucus plugs (arrows), which can mimic acute pulmonary embolism. The posterobasal segment of the right lower lobe bronchus is dilated as well as mucus filled. Identification of the normal accompanying pulmonary arteries (arrowheads) allows the correct interpretation of this finding (Wittram et al., 2004).----- 42

Fig. 45a,b: Left-sided heart failure in a 56-year-old woman with dyspnea. (a) CT scan shows peribronchovascular interstitial thickening caused by perivascular edema (arrow), a finding that can mimic chronic pulmonary embolism. (b) CT scan (lung window) demonstrates the accompanying findings of diffuse peribronchovascular thickening, ground-glass attenuation, smooth interlobular septal thickening (arrows), and bilateral pleural effusions. These findings indicate the true nature of the patient's condition (Wittram et al., 2004).----- 42

Fig. 46 a,b,c,d,e: Localized increase in vascular resistance in a 65-year-old man with dyspnea. (a) CT scan shows a flow artifact caused by a localized increase in vascular resistance (arrow), a finding that can mimic acute pulmonary embolism. Note also the medium-sized left pleural effusion and atelectasis. (b, c) CT scans obtained immediately superior (b) and inferior (c) to a demonstrate an apparent ill-defined filling defect (arrow) that is too high in attenuation to represent pulmonary embolism. (d) Subsequent angiogram demonstrates slight distortion of the posterobasal segment of the left lower lobe pulmonary artery (arrow) but no evidence of pulmonary embolism. (e) More oblique angiogram of the left pulmonary artery also demonstrates no evidence of pulmonary embolism (arrow) (Wittram et al., 2004).----- 43

Fig. 47: Pulmonary artery stump in situ thrombosis in a 69-year-old man who had undergone right pneumonectomy for lung cancer. CT scan demonstrates pulmonary artery stump in situ thrombosis that affects the right pulmonary artery (arrow) (Wittram et al., 2004).----- 44

Fig. 48: Pulmonary artery sarcoma in a 65-year-old woman with dyspnea. Contrast-enhanced CT scan shows a heterogeneously enhancing, lobulated mass within the main pulmonary artery (arrow). A metastatic deposit is noted within the right pulmonary artery (arrowhead) (Wittram et al., 2004).----- 45

Fig. 49: Chronic pulmonary embolism in a 62-year-old man with dyspnea. CT scan shows an eccentrically located thrombus that forms obtuse angles with the vessel wall (arrows). Note the dilated collateral bronchial artery (arrowhead) (Wittram et al., 2004).----- 45

Fig. 50: Tumor embolus in a 78-year-old woman with dyspnea and endometrial stromal sarcoma that invaded the inferior vena cava. CT scan shows a large tumor embolus within the right lower lobe pulmonary artery (arrow) (Wittram et al., 2004).----- 46

Fig. 51a,b: Tumor emboli in a 60-year-old man with dyspnea and primary renal cell carcinoma. (a) CT scan shows tumor emboli that manifest as vascular dilatation and beading of subsegmental arteries of the posterobasal segment of the right pulmonary

---

artery (arrow) (b): Tumor emboli in a 60-year-old man with dyspnea and primary renal cell carcinoma. CT scan shows tumor emboli with a tree-in-bud appearance within secondary pulmonary lobule arterioles (arrow). Tumor emboli rarely have such an appearance at CT (Wittram et al., 2004). ----- 46

Table 1. Revised WHO Classification of PH ----- 47

Fig. 52: Schematics demonstrate the vascular changes of pulmonary arterial hypertension. In cross-section A, medial hypertrophy produces marked thickening of the medial smooth muscle in between internal and external elastic laminae. In cross-section B, intimal proliferation thickens the intima in concentric layers. In cross-section C, a plexiform lesion is characterized by intimal proliferation and interruption of the media by a "glomeruloid" proliferation of small vascular channels (Frazier et al., 2000). 49

Table 2: Causes of secondary pulmonary hypertension can be divided based on primary pathophysiologic mechanisms, as follows:----- 50

Fig. 53: High-resolution CT scan (lung window) demonstrates enlarged central arteries, peribronchovascular thickening, and prominent interlobular septa (Frazier et al., 2000). 54

Fig. 54: Hepatopulmonary syndrome in a patient with advanced liver cirrhosis and clinical evidence of right-to-left shunting. Sliding thin-slab MIP image obtained from single-section CT angiographic data (section collimation, 1 mm; table feed, 3 mm; reconstruction increment, 0.5 mm) demonstrates centrilobular vessel-associated micronodules connected by multiple arcade-like dilated subpleural vessels in the lower lobe (arrowheads) (Engelke and Prokop, 2002).----- 55

Fig. 55: Contrast-enhanced CT scan shows an enlarged pulmonary trunk with a maximum diameter of 39 mm (black line) near its bifurcation, lateral to the ascending aorta—a diameter greater than that of the ascending aorta (Castaner et al., 2006). ----- 56

Fig. 56: Pulmonary hypertension. CT scan obtained with a lung window setting at the level of the upper lobes in a 75-year-old man shows marked enlargement of the pulmonary arteries (arrowheads) in relation to the bronchi (Castaner et al., 2006). ----- 56

Fig. 57: Primary pulmonary hypertension in a 32-year-old woman with average systolic pulmonary arterial pressures of 140-150 mm Hg. CT scan shows enlargement of the central pulmonary arterial system with tapering to the periphery and corkscrew-shaped arteries (Engelke and Prokop, 2002).----- 57

Fig. 58: CT scan obtained with a lung window setting in a 65-year-old woman shows a mosaic perfusion pattern, with increased diameters of vessels in areas of hyperattenuation (arrows) and sharp tapering of peripheral vessels in areas of hypoattenuation (arrowheads) (Castaner et al., 2006).----- 57

Fig. 59: Pulmonary hypertension in a 72-year-old man with a mitral valve abnormality. Unenhanced CT scan shows dilatation and atherosclerotic calcification of the main and right pulmonary arteries (black arrowheads) and the left interlobar artery (white arrowhead) (Castaner et al., 2006). ----- 58

Fig. 60: Right heart abnormalities secondary to pulmonary hypertension in a 56-year-old woman. (a) Contrast-enhanced CT scan shows dilatation of the right ventricle (RV), with a right ventricle/left ventricle (LV) ratio greater than 1:1; leftward septal bowing

---

(arrowhead); thickening of the free right ventricular wall (arrow); and dilatation of the right atrium (RA) (Castaner et al., 2006). ----- 60

Fig. 61: Severe pulmonary hypertension and right heart disease in a 75-year-old patient. CT scan shows opacification of the inferior vena cava and suprahepatic veins because of retrograde flow of contrast material, which is often seen in patients with elevated right atrial and right ventricular pressures (Castaner et al., 2006). ----- 60

Fig. 62: Contrast-enhanced CT scan shows dilatation of the right ventricle (RV) and inferior vena cava (IVC), as well as a small pericardial effusion (\*) (Castaner et al., 2006). ----- 61

Fig. 63 a,b: Diffuse pulmonary arteriovenous shunting in a 28-year-old pregnant woman. Axial (a) and sagittal (b) sliding thin-slab MIP images obtained from ultra-low-dose multisection CT data (effective dose <0.5 mSv) show dilatation of pulmonary arteries and veins in the right lower lobe (\*) with a reticular vascular pattern in the lung periphery (arrowheads) (Engelke and Prokop, 2002). ----- 62

Fig. 64 a,b: 3D color volume-rendered image showing arteriovenous malformation in the left lower lobe 3D color volume-rendered image showing arteriovenous malformation in the left lower lobe (Clarke, 2004).

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Fig. 65 Unresectable bronchial carcinoma in a 30-year-old man. Contrast-enhanced CT scan shows extensive mediastinal tumor infiltration with obliteration of fat planes and encasement of the left pulmonary artery (Castaner et al., 2006). ----- 65

Fig. 66: Idiopathic fibrosing mediastinitis in a 30-year-old man with superior vena cava syndrome. (a) Contrast-enhanced CT scan (mediastinal window) shows an infiltrating soft-tissue attenuation mass in the middle mediastinum. Note encasement and narrowing of the distal superior vena cava (white arrowhead) and right pulmonary artery (black arrowheads) and distention of the azygous vein (arrow). (b) Contrast-enhanced CT scan (mediastinal window) obtained at a more caudal level shows encasement and narrowing of the right superior pulmonary vein (arrowheads) (Rossi et al., 2001). ----- 66

Fig. 67 a,b: Takayasu arteritis. (a) Axial sliding thin-slab MIP image obtained prior to steroid therapy shows central pulmonary arterial wall thickening (arrowheads) and tapering of the lumen at the pulmonary artery bifurcation and left and right main arteries. (b) Axial sliding thin-slab MIP image obtained after corticosteroid and immunosuppressive therapy and right pulmonary artery stent placement (\*) shows improvement in the caliber of the central and peripheral pulmonary arteries of the right lung (arrows) (Engelke and Prokop, 2002). ----- 67

Fig. 68 a,b: Late-stage Takayasu arteritis with right pulmonary artery involvement in a 63-year-old woman. (a) Unenhanced CT scan shows marked stenosis of the right pulmonary artery (arrowheads), left-sided pulmonary hypertension, and wall calcification of the left pulmonary artery and the ascending and descending aorta. (b) Contrast-enhanced CT scan shows right pulmonary artery occlusion (straight arrow), enlarged bronchial arteries (curved arrow) in the right hilum, and an enlarged right internal mammary artery (arrowhead) (Castaner et al., 2006). ----- 68

- Fig. 69: Pulmonary artery aneurysm in a 50-year old man with Behçet disease and hemoptysis. Contrast enhanced CT scan shows aneurysmal dilatation of a left interlobar pulmonary artery (\*) with small mural thrombi (arrowheads) (Castaner et al., 2006). --- 70
- Fig. 70: Mycotic pulmonary artery aneurysm. CT scan shows a peripheral pulmonary artery aneurysm (\*) (Engelke et al., 2002).----- 70
- Fig. 71 a,b,c: Rasmussen aneurysm in a 42 year-old man with active postprimary tuberculosis and massive hemoptysis. (a) Contrast-enhanced CT scan at the level of the upper lobes shows, in an area of cavitation, a small rounded bilobed enhancing lesion (arrows) that arises from a branch of the pulmonary artery (arrowhead). (b) Conventional angiogram shows contrast material filling two aneurysms (arrowheads) in a segmental branch of the right upper lobe pulmonary artery. (c) Posteroanterior chest radiograph obtained after embolization shows coils (arrowheads) in the wall of the tuberculous cavity (Castaner et al., 2006). ----- 71
- Fig. 72: Pulmonary artery sarcoma in a 70-year-old man with dyspnea. Contrast-enhanced CT scan shows filling defects in the main, left, and right pulmonary arteries and the right interlobar pulmonary artery. The arterial lumina are expanded, and there is extravascular invasion (Castaner et al., 2006).----- 73
- Fig. 73 a,b: A case of absent pulmonary artery with absence of lung development. On the CT the left lung is absent. Patient is asymptomatic (Siegel and Smithuis, 2007). ---- 75
- Fig. 74 a,b,c: Unilateral proximal interruption of the right pulmonary artery in a 52-year-old woman with progressive shortness of breath and hemoptysis. (a) Contrast material-enhanced CT scan shows only the proximal portion of the right pulmonary artery (arrowhead) and enlargement of the main and left pulmonary arteries that indicates pulmonary hypertension. (b) Contrast-enhanced CT scan at the level of the upper lobes shows serrated thickening of the right pleura because of enlarged intercostal collateral vessels (arrowheads). (c) CT scan obtained with a lung window setting shows multiple linear opacities perpendicular to the pleural surface that correspond to transpleural systemic vessels (arrowheads) (Castaner et al., 2006).----- 76
- Fig. 75 a,b,c: Idiopathic dilatation of the pulmonary trunk in a 55-year-old asymptomatic woman. (a) Posteroanterior chest radiograph shows an abnormal bulge in the left mediastinal border (arrowheads), a feature suggestive of a mediastinal mass identical to that observed on radiographs obtained 6 years earlier (not shown). (b) Contrast-enhanced CT scan shows abnormal enlargement of the main pulmonary trunk, with mild dilatation of the right and left pulmonary arteries. (c) CT scan obtained with a lung window setting at the same level as b shows normal vessels and parenchyma (Castaner et al., 2006). ----- 77
- Fig. 76 a,b,c,d: Intralobar pulmonary sequestration in a 41-year-old woman. (a) Posteroanterior chest radiograph shows consolidation in the left lower lung (arrowheads). (b) Spiral CT scan shows an enhancing vascular structure (arrow) arising from the thoracic aorta. (c) CT scan obtained at the level of the dome of the liver shows consolidation in the left lower lobe and an enhancing tubular structure (arrow) in the area of consolidation. (d) Coronal maximum-intensity projection image shows an anomalous systemic artery arising from the thoracic descending aorta (Do et al., 2001). ----- 79