Brazilian Consensus on Terminology Used to Describe Computed Tomography of the Chest

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INTRODUCTION

One of the great challenges in the field of science is that of establishing a universal language, or vernacular, that would facilitate understanding and communication among people of different cultures and nationalities. Standardization and globalization of the terms used to express knowledge has merit in that it allows comparison between and among the results of scientific studies, and in that it promotes the dissemination and exchange of information on specific topics.

In recent years, Medicine has advanced greatly through the contribution made by the information sciences in perfecting the capture, registration, modulation and storage of images of the human body. Implicit in the application of modern technology is the need for new language to express the new concepts, thereby facilitating the use of these new resources and the transmission of related knowledge.

Brazil is a country of continental proportions, possessing a rich and diverse culture. In such a country, there is a real need to develop a consensus regarding the terminology to be used in the field of computed tomography (CT), one of the areas in which there have been major advances and which has developed at a rapid pace. Such a consensus is sought with the intention of globalizing knowledge and standardizing key terms for a technology that is widely used in the various fields of medicine.

Reaching a consensus on terminology is an attempt to minimize the effects of linguistic vices, which, over the years, are transmitted to future generations. These problems originate in regional language differences that influence the medical vernacular, as well as in the indiscriminate use of terms in English, with no real concern about finding the appropriate translation or adapting the term to fit the culture.

The kernel of the idea for this project is credited to Doctor Jorge Kavakama, who, motivated by the introductory glossary in the book 'Diagnosis of Diseases of the Chest', written by R.S. Fraser et al.[1], pushed for the creation of a group that, under the guidance of Doctor Marcelo Chaves, undertook the task of translating the Fleischner/American Thoracic Society consensus[2-4] from English to Portuguese and adapting it for use in Brazil. At that same time, another groundbreaking project was undertaken. Doctors Arthur Soares Souza Júnior and Edson Marchiori, inspired by the enthusiasm of these groups and conscious of the need to establish a body of terminology that could serve as a reference for all those interested in diagnostic imaging of thoracic diseases, authored a document entitled 'Glossário Brasileiro sobre a Terminologia dos Descritores de Radiologia e Tomografia Computadorizada do Tórax' ("A Brazilian Glossary of Terms Related to Radiology and Computed Tomography")(5). This document was signed by the entire study group and published in the journal Radiologia Brasileira (Brazilian Radiology), the official organ of the Colégio Brasileiro de Radiologia e Diagnóstico por Imagem (Brazilian College of Radiology and Diagnostic Imaging).

A group led by Doctors Mário Terra Filho and Jorge Kavakama and composed of members of the Sociedade Paulista de Pneumologia (Paulista Society of Pulmonology) and the Brazilian College of Radiology and Diagnostic Imaging, later authored similar documents, which were distributed at the XXXI Congresso Brasileiro de Pneumologia e Tisiologia (Brazilian Pulmonology and Phthisiology Conference). The fruit of this consensual decision was the fact that these documents were routed to a diverse group of specialists, radiologists* and pulmonologists, and have now been made available in the various publications referred to herein.

These initiatives incited the development of a more far-reaching project, aimed at adding the terminology developed by the Brazilian College of Radiology and Diagnostic Imaging to that established by the Departamento de Imagem da Sociedade Brasileira de Pneumologia e Tisiologia (Brazilian Society of Pulmonology and Phthisiology Department of Diagnostic Imaging). The latter was charged with expanding the glossaries and incorporating them into a single, detailed document, with a descriptive narrative. The result was the 'Consenso Brasileiro sobre a Terminologia dos Descritores de Tomografia Computadorizada do Tórax' ("Brazilian Consensus on Terminology Used to Describe Computed Tomography of the Chest"), which has come to serve as a reference for both specialties.

We hope that this will provide the Brazilian medical community with a unified document, through which the terms and expressions necessary to impart the knowledge related to CT of the chest will be standardized and disseminated to all those who deal with this diagnostic resource that is so widely applied in modern medicine.

(*In response to the communiqué issued by the Department of Diagnostic Imaging of the Sociedade Brasileira de Pneumologia e Tisiologia (SBPT, Brazilian Society of Pulmonology and Phthisiology) and delivered jointly to the Associação Médica Brasileira (AMB, Brazilian Medical Association) and the Conselho Federal de Medicina (CFM, Federal Medical Council) on 24 March 2004, and in keeping with the tenor of the arrangement made in CFM Resolution no. 1.666/2003, the specialty previously known as "Radiology" will now be designated "Radiology and Diagnostic Imaging", although the denomination "Radiologist" will continue to be used to refer to a specialist in the area of diagnostic imaging.

AIR TRAPPING. 1. (Physiopathol.) Retention of excess gas ("air") in part of all of the lung (especially upon expiration), such as that seen in cases of airway obstruction (partial or total) or secondary to focal abnormalities of pulmonary compliance. Although less commonly used, the term "gas entrapment" would be more precise. 2. (CT) Reduced attenuation of the lung parenchyma, especially apparent as lower-than-usual density during expiration. This condition should be distinguished from reduced attenuation resulting from hypoperfusion secondary to increased resistance of the pulmonary artery branches. When there is suspicion of a clinical condition that could induce air trapping, a complementary dynamic study, including CT "slices" of the patient in expiratory apnea.

PARENCHYMAL BANDS. Linear elongated opacities in the cortical or corticomedullary junction of the lung, usually less than 1 cm in thickness and several centimeters long (< 5 cm), occasionally touching the pleural surface, which is either inflamed or retracted at the point of contact. The cause of this condition remains unclear. It may be related to microatelectasis in the cortex, edema or fibrosis. These opacities are often reversible.

FUNGUS BALL. Formation that appears in imaging as a rounded mass (ball) composed of hyphae, usually of the genus Aspergillus, accompanied by mucous, fibrin and cellular remnants, that colonize a pre-existing healed pulmonary cavity (e.g. tuberculous cavity). A fungus ball can be differentiated from a neoplasm with necrotic content by capturing images during movement from the decubitus position, during which the ball can be dislocated to a hanging position. Despite being rare, a cavity in the lung parenchyma may be colonized by other pathogens, especially actinomycetes and less common Aspergillus species. In patients suffering from hemoptysis, this presentation form (seen in diagnostic imaging) may result from the formation and retention of a blood clot within the cavity, a condition designated "intracavitary clot (hematoma) syndrome" or "false fungus ball".

BULLA. 1. (Pathol.) Pulmonary cavitation with well-defined, epithelialized walls that are thin and smooth, without areas of thickness or nodulations. In the literature, a bulla is defined as measuring 1 cm or more in diameter, with walls that do not exceed 1 cm in thickness. The objective of this characterization by diameter is to allow bullas to be differentiated from small cysts and honeycombing. 2. (CT) Pulmonary cavitation with well-defined walls and gaseous content (occasional with an air-fluid level), 1 cm or more in diameter, demarcated by a thin wall, occasionally multiple and often accompanied by other indications of pulmonary emphysema. The word "bulla" (plural "bullae") is the term of choice to describe pulmonary cysts containing air, with the exception of pneumatoceles.

AIR BRONCHOGRAM. (Radiol.) Radiological term used to convey the idea of air within a bronchus or within various permeable bronchi, surrounded by the lung parenchyma, whose usual transparence is altered by the exchange of gaseous content for a product of some type, the radiopacity of which is greater than that of air. In general, this expression is used when an image of tubular transparency (gas) is seen within an area of opacified, unventilated lung. This tubular transparency should be of a size and orientation typical of a bronchus or multiple bronchi, presumably representing a segment of the bronchial tree.

BRONCHIECTASIS. 1. (Pathol.) Permanently increased caliber of a bronchus or bronchi by thickening of the walls. When there is no significant bronchial remodeling other than dilatation, the term "cylindrical bronchiectasis" is used. In such cases, a characteristic progressive loss of fibers in the airway, such that it nears the cortex, is observed. This means that the typical progressive reduction in the caliber of the bronchus is absent. Eventually, its normally tubular form becomes altered, presenting foci of dilatation along its walls, assuming a vesicular configuration with irregular constrictions along its length. 2. (CT) Bronchial dilatation, frequently indicating wall thickening and presenting as larger-diameter, uniform tubes (cylindrical bronchiectasis) or as vesicular formations (cystic bronchiectasis). In general, cystic bronchiectasis presents as a cluster or clusters of

cysts distributed throughout the bronchi or along the bronchial axes. A significant anatomical finding is a uniform relationship between the internal diameter of the bronchial structure and the diameter of the blood vessel adjacent to its wall. When the bronchial/vascular relationship is greater than the unit, especially in the presence of bronchial wall thickening, a diagnosis of bronchiectasis becomes more likely (see SIGNET-RING SIGN). In counterpoint, the conditions responsible for the increased intravascular volume in the pulmonary circulation induce an increase in vascular caliber proportional to the diameter of the lumen of the adjacent bronchus, which indicates a diagnosis of bronchiectasis.

TRACTION BRONCHIECTASIS. Bronchial dilatation, usually irregular, together with alterations in the surrounding parenchyma (reticular opacities, either in a ground-glass pattern or consolidated) resulting from an atelectasis-retractile pulmonary fibrosis component. This type of bronchiectasis is secondary to fibrotic lung diseases and is rarely an intrinsic disturbance of the bronchial walls.

BRONCHIOLECTASIS. 1. (Pathol.) Dilatation of a bronchiole or bronchioles, frequently presenting wall thickening. 2. (CT) Similar to cylindrical bronchiectasis, although in the smaller-caliber airways, this condition is generally found in the cortical junction or within an area of fibrotic opacity. Also referred to as "bronchiolar dilatation".

NECROTIC CAVITY. 1. (Pathol.) Pulmonary lesion whose central portion presents liquefaction necrosis resulting from expulsion of liquid from the airways or, occasionally, from fistula drainage into the pleural space, creating a area of gaseous content and with an air-fluid level. 2. (Radiol.) Parenchymal injury, be it a nodule, a mass or a consolidated block, containing gas (presumably caused by leakage from the site of the necrosis), presenting wall thickness greater than 1 mm and generally ill-defined contours, with or without an air-fluid level.

CYST. 1. (Pathol.) Rounded lesion, typically singular, either uniform or varied in configuration, containing gas, liquid or a gelatinous substance, circumscribed by thin, well-defined walls and internally reinforced with epithelial cells. 2. (Radiol.) Rounded lesion with well-defined walls, containing air or other material and presenting density in the soft parts. If the content is gaseous, the wall will be visible, thin and sharp. There is no correlation with pulmonary emphysema. The most common cyst types are bronchial cyst, gastrointestinal duplication cyst, hydatid cyst and postinfection cyst.

CYSTS. (Radiol.) Denomination typically used to describe a set of gas-filled, thin-walled, well-defined cystic cavities, in rounded or irregular shapes, presenting similar diameters (measuring from 0.3 to 1 cm. In the final stage of pulmonary fibrosis or sarcoidosis, this conglomeration is known as "honeycombing". Such cysts are also found in Langerhans cell granulomatosis (histiocytosis X) and in lymphangioleiomyomatosis.

CONSOLIDATION. 1. (Pathol.) When the air in the air spaces is supplanted by any type of product (transudates, exudates, blood, fat, protein, neoplastic cells or inflammatory cells). 2. (Radiol.) Increased (usually homogenous but occasionally heterogeneous) density of the lung parenchyma, resulting in a superficial loss of the natural contrast between the air in the air spaces and the tissue of the vessels or of the bronchial walls, leaving the vessels imperceptible within the area of consolidation. If the bronchi are permeable, they are classified as air bronchograms. The difference between a homogenous or heterogeneous presentation is determined by various factors, especially the healthiness of the subjacent lung parenchyma.

ARCHITECTURAL DISTORTION. This occurs when the lesions significantly modify the structure of the organ, with atelectatic retractions that cause gross distortions in the tracheobronchial tree, in the orientation of fissures and in the blood vessels, with or without accompanying necrotic cavities. In high-resolution CT (HRCT) images, the loss of definition of the secondary lobe is considered an important marker of remodeling of the lung parenchyma.

EMPHYSEMA. 1. (Pathol.) Permanent increase in the size of the air space located distally to the terminal bronchiole, accompanied by destruction of the alveolar walls. The lack of any "obvious fibrosis" has

traditionally been considered an additional criterion, although the validity of this assumption has recently come into question. 2. (CT) Focal area or areas of low attenuation, typically without visible walls, resulting from a real or perceived increase in the air space. Destruction of the alveolar walls is presumed. Emphysema may be accompanied by air trapping. Care should be taken to distinguish areas of hypertransparency caused by emphysema from those resulting from hypoperfusion.

DISTAL ACINAR EMPHYSEMA. 1. (Pathol.) Emphysema characterized by a predominance of alveolar sac and duct involvement. Distal acinar emphysema typically affects the subpleural pulmonary regions, as well as those adjacent to the peripheral interlobular septa and to the blood vessels. 2. (CT) Emphysema characterized by an area of low density, located in the distal air spaces, subpleural region of the cortex or delineated by the peripheral interlobular septa. Synonym: Paraseptal emphysema.

CENTRILOBULAR EMPHYSEMA. 1. (Pathol.) Emphysema characterized by destruction of the alveolar walls and ducts in the parenchyma adjacent to the centrilobular interstice. Typically involves the cranial third of the lungs. This is the type of emphysema that is most strongly correlated with smoking. 2. (CT) Reduced density of the parenchyma surrounding the centrilobular interstice, where arterioles can be seen encircled by a hypertransparent parenchymal halo. The distribution is usually irregular (non-uniform), although tending to be denser in the cranial portions of the lungs. Synonym: Centriacinar emphysema.

PANLOBULAR EMPHYSEMA. 1. (Pathol.) More extensive emphysema that involves not only the portion adjacent to the centrilobular interstice but also the secondary pulmonary lobule. When concomitant with hereditary alpha 1 antitrypsin deficiency, the are predominantly affected is the caudal third of the lungs. 2. (Radiol.) Zones of hypertransparecy (low attenuation) larger than those found in centrilobular emphysema. The term "panlobular emphysema" is employed when extensive areas of rarefaction are identified in the pulmonary vasculature. If the emphysema is of the type that is based on distribution within the lobe, it is conceivable that the prefixes "centri-" (meaning "central") and "pan-" (meaning "all") could be applied in conjunction. In later stages, centrilobular emphysema may involve the entire lobe, to the extent that it is in confluence with the neighboring lobe, at which point it should be called "panlobular". Therefore, advanced forms of centrilobular emphysema can be indistinguishable from panlobular emphysema except in terms of the zones of distribution. Synonym: Panacinar emphysema.

AIR SPACE. (Anat./Radiol.) Any pulmonary space with gaseous content, delineated by the respiratory epithelium or lung parenchyma, excluding airways used exclusively for conduction (internal alveolar spaces, alveolar ducts and alveolar sacs).

INTERLOBULAR SEPTAL THICKENING. Thin linear opacities corresponding to the thick connective septa (interlobular septa) on the periphery. This condition should not be confused with thickening of the interlobular structures. In conventional X-rays, these alterations are referred to as "Kerley lines". Interlobular septal thickening is usually caused by edema, cellular infiltrate or fibrosis and can present as smooth, irregular or nodular.

CENTRILOBULAR STRUCTURES. 1. (Anat.) The center of the secondary pulmonary lobule. This term is used when referring to the arterioles and their principal branches, as well as to the bronchioles and axial interstice that surround them and to the parenchyma that are in direct contact with the structures in this region. These arterioles measure approximately 1 mm and 0.5 to 0.7 mm in diameter, respectively. Nevertheless, the bronchioles that supply these structures under normal conditions resent diameters of approximately 0.15 mm, just within the limits of the resolving power of HRCT. Therefore, normal airways within the secondary pulmonary lobule may not always appear on CT scans.

HONEYCOMBING (HONEYCOMB LUNG). 1. (Pathol.) Pulmonary cysts created as a result of parenchymal fibrosis destruction of the distal air spaces, with remodeling of the acinar and bronchiole architecture. Honeycombing is the final stage of fibrosis, either in parts or in the near totality

of the lungs. 2. (CT) Cystic spaces (3 to 30 mm in diameter), with relatively thick walls (< 5 mm), those that, in clusters, are usually arranged in layers – initially in the subpleural region – and resemble a honeycomb. A diagnostic pitfall is parenchymal consolidation with emphysema, which can give the appearance of fibrotic honeycombing.

FISSURE. 1. (Anat.) The space created by the juxtaposition, through invagination, of the visceral pleura reinforcing each of the pulmonary lobe. In general, these are classified as major (oblique) fissures, which separate the inferior lobes from the others, or the lesser (horizontal) fissure, distinguishing the middle lobe from the upper lobe of the right lung. Supernumerary fissures, which separate some lung segments, are frequently found.

INTERFACE. 1. (Radiol.) When two structures with different radiological densities are found in juxtaposition, it is possible to identify their boundaries (e.g. vessels presenting density in the soft parts coming into contact with the air density in the adjacent ventilated lung). If the air surrounding the vessels in the lung is supplanted by some other material with a density similar to that of the vessels, the interface will be unidentifiable. 2. (HRCT) The "sign of the interface" defines the irregularity of the margins of intrathoracic structures, such as vessels, bronchi and pleural surfaces, and results from interstitial illness, especially those that produce fibrosis.

LYMPH NODE ENLARGEMENT. Increased volume in one or more lymph nodes, surpassing the dimensional limits considered normal for the lymph node chain in question. The term "adenomegaly" is not an acceptable synonym, since lymph nodes are not true glandular structures. The term "lymphatic disease" is reserved for situations in which a disease, such as necrosis, has been identified within a lymph node.

SUBPLEURAL LINE. Opacity, typically curvilinear and thin (only a few millimeters thick), usually situated within 1 cm of the pleura, with a parallel distribution over its surface. It is a nonspecific indicator for atelectasis, edema, fibrosis and inflammation.

INTRALOBULAR LINES. Very thin linear images, corresponding to involvement of the alveolar septa (nonlymphatic interstices) and presenting an appearance similar to extremely fine reticulation. The interlobular septa can be involved, presenting as images of significantly thicker lines, delineating the secondary lobes and circumscribing the intralobular lines. See MOSAIC PATTERN OF ATTENUATION.

SECONDARY PULMONARY LOBULE. According to the definition proposed by Müller, this is a subsegmental unit, identified by interlobular septa surrounding small portions, varying in size, of the lung parenchyma. These small lung sections, which are separated from each other by the interlobular septa, are easily recognizable in HRCT images whenever the lymphatic interstice is affected. That is why the term "secondary pulmonary lobule" has been widely used by radiologists in the description of diffuse lung disease. Despite being a very useful term for describing involvement of the peripheral lymphatic interstices, it should be borne in mind that it is inappropriate to use this term as an anatomical descriptor of a functional lung unit since it has no relation to the bronchial or bronchiolar system, nor to the pulmonary arterial or pulmonary arteriolar system

MASS. Any expansive pulmonary, pleural, mediastinal or chest wall lesion with density in the soft, fatty or bony parts greater than 3 cm in diameter, with at least partially well-defined contours, outside of the topography of the fissures and independent of the characteristics of its contours or the heterogeneity of its content.

MICRONODULE. Rounded opacity with density in the soft or calcified parts and a diameter of less than 7 mm (according to some authors, less than 5 mm or less than 3 mm). Recently, the term "micronodules" has been used as a substitute for "small nodules", applicable when the diameter is less than 1 cm.

NODULE. 1. (Pathol.) Small, circumscribed, roughly spherical focus of abnormal tissue. 2. (Radiol.) Rounded opacity, at least partially delineated and less than 3 cm in diameter (for larger lesions, see MASS), with density in the soft

or calcified parts. If smaller than 1 cm in diameter, it is recommended that the term "micronodule" be used. Nodules may also be defined by the characteristics of their borders (well-defined or ill-defined), by their location or by their distribution (random, perilymphatic, centrilobular or subpleural).

OPACITY. (Radiol.) Image which, due to its greater density, is at least partially distinguishable from the surrounding or superimposed structures. This term should be used when the item does not meet the criteria for being defined as a nodule, mass, consolidation, pleural collection or other specific alteration.

GROUND-GLASS ATTENUATION (OPACITY). Increased lung density (apparent when the attenuation of the X-rays is greater) in which it is still possible to identify the contours of the vessels and bronchial structures within the area affected by a pathological process that causes a reduction in the aeration of the air spaces, whether due to involvement of the interstices or to partial filling of the air spaces. Alternately, this pattern mat result from partial collapse of the air spaces, insufficient respiration or any of a number of other mechanisms. Ground-glass attenuation should be distinguished from consolidation, in which the vessels are not identifiable within the affected area of the lung. Despite the fact that it is usually indicative of a potentially reversible inflammatory process, ground-glass attenuation is occasionally seen concomitant to pulmonary fibrosis. In cases presenting a predominance of opacities or ground-glass attenuation, a finding of traction bronchiectasis or other evidence of subversion of the pulmonary architecture by interposition is an unequivocal indicator of fibrosis.

LINEAR OPACITY. Thin, elongated linear image with density in the soft parts. Rarely, calcification or foreign material, which can increase the attenuation, is seen.

HANGING OPACITY. Imprecise areas of opacity in hanging lung segments, depending on patient position. For example, such opacities would be visible in dorsal segments when the patient is in dorsal decubitus, in caudal segments when the patient is standing erect, and in ventral segments when the patient is in ventral decubitus. The higher atteuation disappears when the patient position is changed.

PARENCHYMAL OPACIFICATION or OPACITY (in the lung parenchyma). Increased attenuation in the lung parenchyma that may potentially obscure the contours of the vessels. Consolidation indicates that the vessels are not visible, and ground-glass attenuation indicates that, despite the altered lung density, the vessels remain identifiable. A mass, a pleural collection or a change in the chest wall can also be described as opacities even when they do not qualify as such (e.g. "...ill-defined opacity in the caudal third of the left hemithorax, the location of which is not readily identifiable as pulmonary, pleural or chest wall in the non-CT radiological study...").

TREE-IN-BUD PATTERN. Dilated brochioles filled with pathological material, visible as branching tubular patterns with small nodulations at the extremities, resembling certain types of trees that, when denuded of foliage, present buds along their trunks and extremities. This finding is indicative of respiratory disease affecting the airways and is particularly common in infectious processes disseminated via the bronchial pathway (e.g. pulmonary tuberculosis), as well as in cystic fibrosis, diffuse panbronchiolitis and other chronic infectious respiratory diseases. This term describes dilatation of the distal airway with bronchiolectasis and mucocele of the bronchioles or filled with inflammatory tissue. In some cases, this pattern can be seen concomitantly with infiltration of the peribronchial connective tissue in the centrilobular vasculature.

MOSAIC PATTERN OF ATTENUATION. Seen in HRCT scans, this pattern presents superimposition of ground-glass opacities and thickened septa. Sometimes referred to as "crazy paving", the mosaic pattern was first identified in patients with pulmonary alveolar proteinosis but may also be seen in a variety of other nosological entities.

MOSAIC PERFUSION. Latticed appearance in areas of distinct attenuation, interpreted as secondary to the regional differences in perfusion.

A more appropriate term than the previously employed "mosaic oligemia". This finding can indicate vascular obstruction or abnormal ventilation and is more common in patients with respiratory diseases involving the airways. The vessels in the translucent areas of the lungs are characteristically of a smaller caliber than those seen in the denser regions. Expiratory HRCT scans are highly useful in making a diagnosis of mosaic perfusion resulting from respiratory diseases involving the airways. Air trapping secondary to bronchial or bronchiolar obstruction may produce foci of lower attenuation, which become more evident in expiratory CT scans. Mosaic perfusion should not be mistaken for a mosaic pattern of attenuation.

RETICULAR PATTERN (RETICULATION). Express alteration in lung density manifested by innumerable linear streaks, irregularly arranged, giving the impression of seeing a normal lung through a delicate, transparent and reticulated fabric (e.g. mosquito netting). Reticulation would be the term to describe focal areas of agglomeration of reticulated images of any thickness. See MOSAIC PATTERN OF ATTENUATION.

PNEUMATOCELE. (Pathol./Radiol.) Thin-walled, gas-filled space within the lung, usually accompanying acute pneumonia (most commonly staphylococcal) and invariably transitory in nature. Caused by small area of bronchiolar necrosis sufficient to allow unidirectional passage of air into the air spaces during inspiration. This air becomes trapped, impeded from returning to its source due to the reduction in airway caliber that typically occurs during expiration, thereby establishing a mechanism of valvular localized hyperinflation.

PSEUDOPLAQUE. Irregular band of peripheral pulmonary opacity adjacent to the visceral pleura, that simulates pleural plaque but is formed of small coalescent nodules (e.g. subpleural nodules from sarcoidosis).

SIGNET-RING SIGN. Areolar opacity, usually indicating a thick-walled (dilated) bronchus, together with a smaller, rounded opacity with a contiguous wall and composed of soft tissue (branches of the adjacent pulmonary artery or, rarely, of the dilated bronchial artery) in the form of a "signet ring". This finding usually indicates bronchiectasis.

AIR CRESCENT SIGN. Image showing a mass with density in the soft parts, within a cavity, in which the air is interposed between the upper surface (antigravitational) of the mass and the cavity wall in the form of a crescent or half moon. This finding frequently corresponds to a dianosis of intracavitary fungus ball.

HALO SIGN. Ground-glass opacity surrounding a nodule, mass or rounded area of consolidation. This is a nonspecific sign (frequently seen in association with various etiologies). Nevertheless, in a febrile neutropenic patient, this finding usually indicates fungal infection, angioinvasive aspergillosis or mucormycosis in particular.

NODULAR SEPTUM SIGN (ROSARY BEADS). Septal thickening that gives the appearance of a string of beads. This is typically a sign of lymphangitic carcinomatosis, but may occasionally occur in cases of sarcoidosis.

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