Computed tomography - histology correlations of unusual lung tumors

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Key words
Pulmonary neoplasms • Computed tomography • Histopathology

Summary
A large variety of rare benign and malignant tumors may sporadically affect the lung. Computed tomography (CT) findings of unusual primary lung tumors are often nonspecific. However, there are some rare pulmonary tumors with imaging features overlapping those of other conditions, thus making radiologic diagnosis challenging. The aim of this review was to correlate CT and histopathological features of a variety of unusual lung tumors to better clarify when and to what extent radiological diagnosis is reliable.

Introduction
The most unusual primary lung tumors do not generally show specific findings at computed tomography (CT). Indeed, they manifest as nodules, masses, overlapping the CT features of more common forms. However, a number of unusual lung tumors may show some peculiar CT features (e.g. density-texture, high iodinated contrast uptake etc.) that help radiologists suggest the diagnosis firstly. These tumors may have either epithelial or mesenchymal origin. In addition, there are some rare cystic tumors with CT features that may overlap some interstitial non-neoplastic lung disorders.

The aim of this review was to match histologic and CT features of the rarest epithelial and mesenchymal tumors to narrow the diagnostic role of CT (Tabs. I-V, Figs. 1, 2).

Epithelial tumors of the lung

Tumors with airways involvement
Because of their typical localization, some rare tumors involving the airways can be promptly recognized at chest CT.

<p>| Tab. I. Summary of airway-centered neoplasms along with their common CT features. |
|--------------------------------------|---------------------------------------------------------------------------------|</p>
<table>
<thead>
<tr>
<th>Airways lesions</th>
<th>CT typical/common features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracheobronchial gland tumors</td>
<td>Solitary soft tissue nodule or mass with smooth, lobulated or polypoid margins that may demonstrate mild enhancement and punctate calcifications. They are located within segmental bronchi (Mucoepidermoid Carcinoma) or more proximally in distal trachea (with extratracheal component), or lobar bronchi (Adenoid Cystic Carcinoma).</td>
</tr>
<tr>
<td>Tracheobronchial papillomatosis</td>
<td>Multiple, small, confluent, tracheal and endobronchial nodules (preadolescent children); solitary polypoid nodule, typically within the lobar or segmental bronchus (middle-aged adults).</td>
</tr>
<tr>
<td>Carcinoid</td>
<td>Solitary, well-defined, oval or lobulated, 1–3 cm in size, soft tissue nodule. Typical carcinoid are mainly located within the large airways; atypical carcinoids are usually peripheral. Both may show an extraluminal component (e.g. the so-called “iceberg lesions”), high contrast enhancement and calcification.</td>
</tr>
</tbody>
</table>

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### Tab. II. Summary of pulmonary peripheral lesions presenting as multiple nodules or masses along with their common CT features.

<table>
<thead>
<tr>
<th>Pulmonary peripheral lesions: multiple nodules/masses</th>
<th>CT typical/common features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benign Metastasing Leiomyoma</td>
<td>Multiple, slow-growth, peripheral, nodules and masses of various size (ranging from few millimetres to several centimeters), with endobronchial and pleural sparing.</td>
</tr>
<tr>
<td>Angiosarcoma</td>
<td>Multiple bilateral nodules, ranging from 0.5 to 3.0 cm in diameter, with attenuation similar to that of muscle and displaying various degrees of enhancement, often surrounded by a halo of ground-glass attenuation (“halo sign”).</td>
</tr>
<tr>
<td>Kaposi’s Sarcoma</td>
<td>Bilateral and symmetric ill-defined nodules in a peribronchovascular distribution (flame-shaped lesions), with tendency to coalescence. CGO may be seen surrounding the nodules.</td>
</tr>
<tr>
<td>Epitheliod Hemangioendothelioma</td>
<td>Well circumscribed, multiple, bilateral, small nodules, possible pleural effusion. Large “halo sign” may be present.</td>
</tr>
<tr>
<td>Angiocentric Lymphoma</td>
<td>Multiple, bilateral, small, poorly marginated pulmonary nodules with basal predominance and peribronchovascular distribution. They may migrate spontaneously, cavitate and/or display the “reversed halo sign”.</td>
</tr>
</tbody>
</table>

### Tab. III. Summary of pulmonary peripheral lesions presenting as solitary nodule or mass along with their common CT features.

<table>
<thead>
<tr>
<th>Pulmonary peripheral lesions: Solitary nodule/mass</th>
<th>CT typical/common features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sclerosing Haemangioma</td>
<td>Solitary, well-circumscribe, round or ovoid nodule with marked and early enhancement.</td>
</tr>
<tr>
<td>Pulmonary Adenomas (Papillary, Alveolar, Mucus Gland)</td>
<td>Well-defined, solid and solitary nodule without specific CT features. Mucus gland adenoma mainly involves the proximal tracheobronchial tree, papillary and alveolar adenoma is more commonly seen in the periphery of the lung.</td>
</tr>
<tr>
<td>Sarcomatoid Carcinoma</td>
<td>Large, lobulated, heterogeneous content-mass, more commonly observed in the right upper lobe with pleural effusion.</td>
</tr>
<tr>
<td>Primary intrapulmonary Thymoma</td>
<td>Heterogeneous solitary mass (median size of 35 mm; range 15-128 mm), commonly observed in the peripheral portions of the upper lobes</td>
</tr>
<tr>
<td>Primary malignant melanoma of the lung</td>
<td>Peripheral lobulated mass, with no specific features.</td>
</tr>
<tr>
<td>Leiomyosarcoma</td>
<td>Smooth, lobular nodule or large mass.</td>
</tr>
<tr>
<td>Fibrosarcoma</td>
<td>Lobulated, well marginated, homogeneous mass or nodule with possible endobronchial growth (e.g. in particular in children).</td>
</tr>
<tr>
<td>Rhabdomyosarcoma</td>
<td>Large mass with heterogeneous density and contrast enhancement due to necrosis.</td>
</tr>
<tr>
<td>Hemangiopericytoma</td>
<td>Well defined central or peripheral heterogeneous, solid large mass, with signs of necrosis, and calcification.</td>
</tr>
<tr>
<td>PEC-oma</td>
<td>Round, peripheral parenchymal nodule (average tumor size: 3.6 ± 2.4 cm in diameter) with no specific lobar distribution and no evidence of cavitation or calcification; it might show heterogeneous as well as intense post-contrast enhancement due to its rich vascular stroma.</td>
</tr>
</tbody>
</table>

### Tab. IV. Summary of fat-containing neoplasms neoplasms along with their common CT features.

<table>
<thead>
<tr>
<th>Fat-containing neoplasms</th>
<th>CT typical/common features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liposarcoma</td>
<td>Large, smoothly marginated mass with fat attenuation and soft tissue strands within the mass.</td>
</tr>
<tr>
<td>Lipoma</td>
<td>Well defined mass, with homogeneous fat attenuation.</td>
</tr>
</tbody>
</table>

### Tab. V. Summary of pulmonary cystic neoplasms along with their common CT features.

<table>
<thead>
<tr>
<th>Pulmonary cystic tumors</th>
<th>CT typical/common features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Tracheobronchial Papillomatosis</td>
<td>Solid nodules and multiple cysts (fewer than LAM or PLCH) with either thin or thick walls, typically located in the posterior regions of the lung.</td>
</tr>
<tr>
<td>Cystic fibrohistiocytic tumor</td>
<td>Multiple bilateral pulmonary thin-walled cysts.</td>
</tr>
<tr>
<td>Mesenchymal Cystic Hamartoma of the Lung</td>
<td>MCH comprises a broad spectrum of disease ranging from non progressive nodular disease and isolated cysts to gradually but relentlessly expanding cysts.</td>
</tr>
<tr>
<td>Pulmonary Blastoma</td>
<td>Well defined, mixed solid and cystic, large solitary mass, resembling cystic adenomatoid malformation.</td>
</tr>
</tbody>
</table>
Tracheobronchial papillomatosis
Airways papillomatosis is usually related to Human Papilloma Virus (HPV) infection, commonly via vertical transmission during birth. It is characterized by benign lesions in the larynx, trachea and bronchi, with limited lung involvement. It may show an aggressive pattern of growth, producing multiple and extensive endobronchial lesions. Malignant transformation has been described. The involvement of lung parenchyma (so called Pulmonary Advanced Papillomatosis) occurs as a severe complication of tracheobronchial papillomatosis in less than 1% of cases. It can develop after many years of latency following the onset of laryngeal disease. Such complication carries a poor prognosis, because of extensive parenchymal infiltration. Patients with pulmonary papillomatosis are prone to recurrent infections and suffer of an increased risk of development of squamous cell carcinoma.

Histologic findings
Tracheobronchial papillomatosis is well differentiated at histology without cytological anaplastic features, despite his aggressive pattern of growth. Single, regularly layered arrangements of keratin resembling keratotic plugs may be specific.

CT findings
Tracheal and endobronchial papillomas usually manifest as multiple, small, sessile or pedunculated, nodules protruding into the tracheal lumen. As opposed to other airways tumors, nodules may aggregate in papillomatosis. Sometimes papillomas may appear as smooth thickening of airway wall.

In Pulmonary Advanced Papillomatosis, CT findings usually consist of solid nodules and multiple cysts (fewer than in LAM or PLCH) with thin or thick walls, which often predominate in the posterior regions of the lung. In some cases, large papillomas of the airways may cause post-obstructive atelectasis, or pulmonary infections.

Coexisting or previously documented laryngeal disease may help radiologists suggest the correct diagnosis.

The lesions of respiratory papillomatosis are well differentiated at histology, which is reflected on CT by smoothly marginated homogenous nodules, without perilesional ground-glass (Figs. 3, 4).

Adenoid cystic carcinoma
Adenoid cystic carcinoma (ACCs) is the second commonest primary tumor of the trachea after squamous cell carcinoma. It is a mucous gland tumor, as well as tracheobronchial mucous gland adenoma and mucoepidermoid carcinoma. As it typically grows in central airways lumen, ACC may determine signs and symptoms of obstruction, for instance hemoptysis.

Histologic findings
The adenoid cystic carcinoma is composed of small-sized cells with scant cytoplasm and hypercromatic nuclei.
nuclei, showing frequent perineural invasion and infrequent mitosis. Three different growth patterns are described (i.e. cribiform, the most characteristic, tubular and solid), which may coexist. The differential diagnosis includes carcinoid tumors, small cell carcinoma and basaloid squamous cell carcinoma; those tumors are typically distinguished by immunohistochemical staining.

**CT findings**
ACC usually grows in the distal tract of the trachea, but can also develop in the lobar bronchi. It appears like an intraluminal mass of soft-tissue attenuation with common extra-tracheal extension, unlike mucoepidermoid carcinoma and mucous gland adenoma that typically grow within the airway. ACC is frequently misdiagnosed as carcinoid tumors because of its extra-tracheal pattern of growth, however it rarely has calcification and lower contrast enhancement.

**Carcinoid**
Carcinoid tumor derives from neuroendocrine cells of the bronchial mucosa and is classified into two main histologic subtypes: typical (80-90%) and atypical (10-20%). Pulmonary carcinoid tumor is rarely hormonally active and even more rarely cause ectopic ACTH-dependent Cushing’s syndrome as compared to the carcinoid tumors from other organs. Main to subsegmental bronchi are the principal location of pulmonary carcinoid (85%), mean age at presentation is 45 years.

**Histologic findings**
Typical and atypical carcinoids are distinguished by histologic features: (a) mitotic activity, (b) cytologic pleomorphism and nuclear-to-cytoplasmic ratios, (c) tissue cellularity and architectural distorsion, and (d) areas of tumor necrosis. Both categories appear as small nests or interconnect-
Tumors with parenchymal involvement

Sclerosing hemangioma
Sclerosing hemangioma is a rare benign epithelial tumor that occurs predominantly in middle-aged women. On CT its diagnosis may be challenging, though it displays some specific features.

Histologic findings
The name sclerosing hemangioma reflects the presence of sclerosis and dilated vascular spaces, which are deemed secondary changes within the epithelial neoplasm. The tumor is composed by two cell types (e.g. surface cells and round cells) variably assembled into four architectural patterns (e.g. papillary, sclerotic, solid, and hemorrhagic). Both cell types can display moderate to marked nuclear atypia with rare mitoses and scant pleomorphism, and without necrosis. Immunohistochemical profile is used to differentiate between the two cell types and to apportion each component. Markers are thereafter reported according to the specific representation:
- vimentin, progesterone receptor, estrogen receptor (rarely, weak) are positive in round cell component;
- CK7, CKAЕ1/3, napsin and surfactant are positive in surface cells, variable/weak in round cells;
- EMA and TTF-1 are positive in both surface and round cell;
- CEA, S100, smooth muscle actin, chromogranin, synaptophysin, CD34, HMB45, calretinin, HBME1, CK5/6 and WT-1 are negative in both cell types.

More than one architectural pattern coexist in all sclerosing hemangiomas, with the papillary, sclerotic, and solid ones being the most frequent.

CT findings
Solitary rounded or ovoid solid nodule is the most frequent CT finding of sclerosing haemangioma. It is usually located in the peripheral parenchyma, especially in a subpleural location, with slight predominance for the right lung. Bilateral multiple lesions have also been reported, though less common.

The entity and pattern of contrast enhancement depends on the proportion of each histological component. Notably, vascular component is associated with early overt enhancement.

In a recent study, four main features of the tumor were described, as follows:
- “marginal pseudocapsule” sign (50%) due to the focal compressed parenchyma next to tumor;
- “overlying vessel” sign (26.3%) related to small feeding or draining vessel adjacent to the tumor or even displaced by the mass effect, also described like a tumor ‘tail-like’ projection;
- “air-gap” sign (2.6%) caused by the proliferation and hyaline degeneration of undifferentiated alveolar mesenchymal cells around the bronchus. Such architectural abnormality causes the expansion of the far-end edge of the airway with associated on set of air gap. Such finding can mimic the air crescent sign, which is more commonly related to mycetoma;
- “halo” sign (17.1%) is caused by the shrinkage of the coating membrane and the tumor. The shrinkage typically happens with different timing between the two components and is associated with bleeding and seen on CT as GGO.

Soft tissue and mesothelial tumors

Fat-containing tumors
The identification of fat density tissue within a pulmonary lesion is probably the most reliable CT feature to narrow the differential diagnosis. Fat-containing lesions maybe either intra-parenchymal or endobronchial.
**Liposarcoma**

Primary liposarcoma of the lung is one of the rarest varieties among lung sarcomas.\(^{24,25}\)

**Histologic findings**

Thoracic liposarcoma shows the same histological features seen in other districts, with lipoblasts characterized by malignant features such as nuclear pleomorphism and signs of neoangiogenesis.\(^{26}\)

**CT findings**

Liposarcoma usually appears as a large, smoothly marginated, heterogeneous mass of fat attenuation. It should be differentiated from other fat-containing lesions such as pulmonary lipoma, hamartoma, and exogenous lipid pneumonia.\(^{27-30}\) The presence of soft tissue strands in a fat containing mass should suggest the possibility of liposarcoma. However, there are other entities with a fat attenuation component. Coexisting “popcorn” calcification within an intrapulmonary nodule is virtually diagnostic of hamartoma, especially in lesions less than 2.5 cm in diameter.\(^{31-35}\) Bilateral consolidations with fat attenuation, predominantly in the lower lobes, in patients with history of aspiration of oily-substances are the CT features of lipoid pneumonia (Figs. 8, 9).\(^{36}\)

**Lipoma**

Lipoma is extremely rare in the lung, despite it is the most common benign neoplasms. In most of these cases, it originates in the trachea or mainstem bronchi.\(^{37}\)

**Histologic findings**

Lipomas consist of well-circumscribed, yellowish nodules composed of mature adipose cells, indistinguishable from normal fat.

**CT findings**

Pulmonary lipoma appears as a well defined, fat attenuation mass (about -100 HU).

Intrapulmonary lesions are surrounded by aerated lung tissue. Intrabronchial neoplasm may be pedunculated.\(^{38,39}\)

The lack of nodules or of tissue strands in a predominant fatty lesion is highly indicative of pulmonary lipoma.

**Mesenchimal tumors of myomatous origin**

**Benign metastatizing leiomyoma**

Benign metastatizing leiomyoma (BML) of the lung exclusively occurs in middle-aged women with history of benign uterine leiomyoma. It is hypothesized that hematogenous spread of tumor cells is aused by surgical manipulation of the uterus. However, BML is a rare condition despite the high prevalence of uterine leiomyomas treated by hysterectomy.\(^{40}\)

**Histologic findings**

Histologic examination reveals connected fascicles of smooth muscle cells without anaplasia or vascular invasion, with entrapped respiratory epithelium or cysts. Uniform, bland and cohesive spindle cells, without signs of mitosis are organized in clusters, however the cytologic pattern of the lesion is non-specific and without atypia or necrosis. The low Ki-67 index (< 5%) and the absence of high cellularity support the low proliferative state, consistent with a benign lesion. Positive immunohistochemical markers such as desmin, smooth muscle actin, and caldesmin confirm the mesenchymal derivation.\(^{41}\)

The presence of estrogen and progesterone receptors suggests the derivation from the female genital tract.\(^{42}\)

**CT findings**

Benign metastatizing leiomyoma appears as multiple, slow-growth, non calcified, peripheral, nodules and masses (ranging from few millimeters to several centimeters), with endobronchial and pleural sparing. As compared to lung metastases from other tumors, benign
metastatizing leiomyoma does not show contrast enhancement. Cavitation of the nodule or mass, and consequent pneumothorax have also been described on CT, but extremely uncommon.

In patients with an history of surgical manipulation of the uterus and CT findings of heterogeneous lesion with central necrosis, radiologists may suggest the degeneration toward leiomyosarcomatous tissue; in such case scenario, a further histologic examination is recommended (Figs. 10, 11).

**Mesenchimal tumors of vascular origin**

**Angiosarcoma**
Malignant vascular tumors represent less than 2% of all sarcomas. Metastases from primary angiosarcoma of heart, pulmonary arterial trunk, and extrathoracic (tegument, liver and breast) are relatively more frequent than primary pulmonary angiosarcoma.

Primary angiosarcoma usually occurs in middle-aged adults and can be suspected in relation with hemoptysis, usually prolonged, without response to therapy, variably associated with chest pain and cough. It usually presents with multiple foci, but solitary primary pulmonary angiosarcoma has also been reported.

**Histologic findings**
Primary pulmonary angiosarcoma shows similar features of angiosarcoma in other sites.
Intra-arterial and periarteriolar involvement as well as extensive recent and old hemorrhage suggest primary pulmonary angiosarcoma in spite of metastatic lesions. Positive immunohistochemical stains for CD31, ERG or CD34 (not specific) confirm vascular origin of tumors. The differential diagnosis of angiosarcoma include Kaposi’s sarcoma, diffuse pulmonary lymphangioleiomyomatosis, pulmonary capillary hemangiomatosis, metastatic artery sarcoma and primary and metastatic spindle cell carcinoma.

Kaposi sarcoma showed nuclear staining for HHV-8, whereas the cases of angiosarcoma and benign vascular lesions were negative for HHV-8.

**CT findings**
Multiple solid nodules or masses (5-30 mm in diameter), with density similar to that of muscle are the most common CT finding along with variable degrees of enhancement. The tumor frequently spreads through the thorax with invasion of the mediastinum and chest wall. Both pleural and pericardial effusion may be present. Local invasion and erosion of bronchi associated with alveolar perilesional hemorrhage have been described. Indeed, characteristic CT appearance of angiosarcoma consists of a central area of soft tissue attenuation surrounded by a halo of ground-glass attenuation (“halo sign”). Noteworthy, the “halo sign” is a quite aspecific finding on CT because it is quite common in infectious abnormalities such as angioinvasive aspergillosis, tuberculosis associated with hemoptysis, candidiasis, and infections from cytomegalovirus, herpes simplex virus, or coccidioidomycosis. Non-infectious causes of the halo sign include granulomatosis with polyangiitis and Kaposi’s sarcoma.

**Cystic lung tumors**
Lung cysts in the adult population can be detected in a wide variety of diseases including idiopathic proliferative disorders and tumors.

Lung cysts commonly appear on chest CT as round parenchymal lucencies surrounded by a thin wall (< 2 mm). Primary cystic tumors are very uncommon, with those of mesenchymal origin being the most common type. However, non-mesenchymal tumors have been described in association with cystic CT pattern. Notably, multiloculated cysts may be seen in lepidic adenocar-
The differential diagnosis of cystic tumors includes non-neoplastic disease associated with cystic lesions of the lung, such as pulmonary Langerhans cell histiocytosis (PLCH), lymphangioleiomyomatosis (LAM), lymphoid interstitial pneumonia (LIP), infectious pneumatoceles (Pneumococcus, Escherichia Coli, Klebsiella, Staphylococcus and Pneumocystis), coccidiomycosis, hydatid disease, immunologic disorders (granulomatosis with polyangiitis and rheumatoid nodules) and congenital pulmonary airway malformation. Multiple thin-walled cystic lesions, referred as “cheerios in the lung” pattern, can be seen in metastatic involvement of the lung from a variety of extrapulmonary malignancies.

Extrathoracic mesenchymal tumors (e.g. sarcomas, squamous cell cancer, transitional cell carcinoma of the bladder, and melanoma) and gastro-intestinal or genito-urinary adenocarcinomas are more frequently associated with cystic pattern. Cystic metastases may appear heterogeneous in size with basal predominance. The diagnosis is hardly based on the sole imaging because similar features overlap in different diseases. Therefore demographic data (i.e. age) are helpful to narrow the differential diagnosis.

**Pulmonary blastoma**

Pulmonary blastoma often occurs at an early stage, with a median age of 2 years at presentation. It accounts for 0.25-0.5% of primary lung malignancies.

**Histologic findings**

Grossly the lesion is peripheral, solitary, well circumscribed and large. Histological specimen usually shows early embryological lung features from immature malignant epithelial and mesenchymal tissues.

**CT findings**

On CT scans, pulmonary blastoma appears as an heterogeneous mass with combined solid and cystic components. The mass size is generally large (from 15 mm up to over 10 cm). Furthermore, an heterogeneous enhancement of the solid component is seen after contrast agent injection. Pleural effusion has been reported as the sole finding in the most atypical cases (i.e. with undetectable lung lesion). Pulmonary blastoma may also manifest as a branching opacity with a “gloved finger” appearance, thus mimicking fungal infection. Pulmonary blastoma of the childhood may be seen in association with pre-existing benign cystic lesion, notably, cystic adenomatoid malformation and bronchogenic cyst of the lung. Complete opacification of one hemithorax with mediastinal shift is a possible manifestation of the pediatric variant.

**Pulmonary mesenchimal cystic hamartoma (MCH)**

Pulmonary mesenchimal cystic hamartoma is an extremely rare subtype of pulmonary hamartoma.

**Histologic findings**

MCH is hystologically characterized by parenchymal nodules of primitive mesenchymal cells that gradually increase in size and then become cystic.

**CT findings**

Typical CT findings of MCH include multiple cysts that may be associated with pulmonary nodules, both are extremely variable in size (1-10 cm). The cysts and/or nodules can slowly increase in size and number over time.

**Cystic fibrohistiocytic tumor**

Cystic fibrohistiocytic tumor is an exceptionally rare neoplasm, which is usually caused by metastatic localization from a benign or low-grade cellular fibrous histiocytoma of the skin. Nevertheless, primary localizations have been described, too.

**Histologic findings**

Thin-walled cystic airspaces delimited by cuboidal epithelium with underlying layer of mildly pleomorphic spindle cells and inflammatory cells are the usual presentation of this rare tumor.

**CT findings**

Bilateral solid nodules and masses with cavitation into cystic lesions are the typical CT findings of both the primary and secondary involvement (Fig. 12).

**Tumors associated with congenital cystic adenomatoid malformation (CCAM)**

Congenital cystic adenomatoid malformations have been recently considered as part of congenital pulmonary airway malformation (CPAM). CCAM is a congenital developmental deformity that occurs in newborn and small children, with variable prognosis according to the subtype of malformation.

![Fig. 12. Cystic fibrohistiocytic tumor: HRCT showing multiple bilateral pulmonary thin-walled cysts.](image_url)
The five types of the Stocker classification describe the affected portion of the airway, the diameter of the cysts and the epithelial changes, reflecting the different CT findings that may be shown, like large cysts (3-10 cm) for type 1 and very small cysts (< 0.2 cm) for type 3 (Fig. 13). 

**Pulmonary advanced papillomatosis**

Pulmonary advanced papillomatosis is a rare complication of tracheobronchial papillomatosis (less than 1% of cases), with extensive parenchymal involvement. It is associated with poor prognosis, recurrent infections, and increased risk of squamous cell carcinoma. In patients with solid nodules and multiple cysts (fewer than in LAM or PLCH) with thin or thick walls in the posterior regions of the lung, a known history of tracheobronchial papillomatosis may suggest the diagnosis.

**Conclusions**

Unusual lung tumors represent a broad range of histological types that have a large spectrum of CT features. These tumors cannot usually be distinguished from the more common primary lung malignancies, nevertheless, the combination of CT findings such as the tracheobronchial location, the presence of fat and the pattern of enhancement after injection of contrast agent can occasionally suggest a specific diagnosis of an unusual lung tumor.

**References**

COMPUTED TOMOGRAPHY - HISTOLOGY CORRELATIONS OF UNUSUAL LUNG TUMORS

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