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What is the significance of a tracheal bronchus aka pig bronchus?

A tracheal bronchus represents variant pulmonary anatomy in which a bronchus arises from the right aspect of the trachea just above the bifurcation of the left and right mainstem. This tracheal bronchus is likely to supply air to the entire right upper lobe. This can be associated with air trapping and recurrent RUL infection due to diminished ventilation.

What is the retrotracheal triangle aka Raider triangle?

Space behind trachea, anterior to thoracic vertebral bodies and above the aortic arch. For board exams, most classic is that the Raider triangle is the space that contains an aberrant right subclavian artery.

True or false: Carcinoid of the trachea is more common than carcinoid involving a bronchus?

False. Carcinoid rarely involves the trachea, is much more common involving the bronchus.

What is more common in the trachea: adenoid cystic carcinoma or mucoepidermoid carcinoma?

Adenoid cystic carcinoma. In fact, adenoid cystic carcinoma is thought to be the 2nd most common tracheal malignancy. Mucoepidermoid carcinoma can present anywhere in the airway though is more common in bronchi than the trachea. Of note, mucoepidermoid carcinoma is the most common malignancy of the salivary glands, adenoid cystic carcinoma is #2.

What is the #1 most common primary tracheal tumor?

Squamous cell carcinoma.

Which portion of the trachea does squamous cell carcinoma most commonly involve? Which portion of the trachea does adenoid cystic carcinoma most commonly involve?

Squamous cell carcinoma more common in lower trachea/proximal bronchus. Smoking related disease—I imagine that smoke settling to the bottom of the trachea and causing cancer there to help me remember this. Adenoid cystic more common in proximal trachea, most common in posterolateral aspect.

Which entity is more likely to invade the mediastinum—adenoid cystic carcinoma or mucoepidermoid carcinoma?

Adenoid cystic carcinoma. Remember that adenoid cystic carcinoma invades things. Perineural invasion and spread is classic for adenoid cystic carcinoma of the head and neck. Mediastinal invasion can be associated with adenoid cystic carcinoma of the trachea.

What are the most common malignancies to metastasize to the trachea?

Think cancers that can directly extend into the trachea: lung cancer, thyroid cancer and esophageal cancer.

What entities can cause squamous cell papilloma of the trachea?

Smoking and/or human papilloma virus (HPV). With a single papilloma of the trachea you would think smoking first. With multiple papillomas think HPV first. Note that a squamous cell papilloma is the most common benign tumor of the trachea.

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A saber sheath trachea is classically associated of which entity?

COPD. Saber sheath trachea is the term for narrowing of the trachea in the coronal plane, with sparing of the extrathoracic trachea. This is considered to be pathognomonic for COPD. The etiology is hyperexpansion of the lungs causing tracheal narrowing in coronal plane due to compression between the hyperexpanded lungs. The intrathoracic trachea will be something like 1/3 as wide in the coronal plane as the sagittal plane with saber sheath trachea.

Is tracheal cartilage located within the anterior or posterior aspect of the trachea?

Tracheal cartilage involves the anterior aspect of the trachea. The posterior aspect is the tracheal membrane is not cartilage containing and is able to bow inward upon expiration, as can be seen on an expiratory phase CT sequence.

What are 3 key questions you can ask yourself when approaching a tracheal disease question to help narrow the differential?

1. Is disease involvement focal or diffuse? 2. Is the posterior membrane involved? Another way to consider this is whether the disease is purely cartilaginous (will spare posterior membrane) or circumferential (will involve posterior membrane). 3. Are there tracheal calcifications? Note that diffuse means a long segment of the trachea is involved and does not mean that involvement of the trachea is circumferential.

How do these key questions apply to relapsing polychondritis?

1. Diffuse involvement more common. 2. Posterior membrane is spared. 3. No calcifications.

Relapsing polychondritis results from recurrent episodes of autoimmune driven cartilage inflammation and recurrent pneumonia. The tracheal cartilage only involves the anterior and anterolateral trachea and since this is a disease of the cartilage you could predict that the posterior membrane is spared, which would be correct. Other sites of involvement can include the ear and nose. Acute inflammation is painful. Associated with arthralgia (cartilage inflammation), glomerulonephritis, abdominal aortic aneurysm and cardiovascular disease such as valvular disease and pericarditis.

How do these key questions apply to granulomatosis with polyangiitis (GPA) of the trachea?

1. Focal or diffuse involvement. 2. Posterior membrane involved (circumferential involvement). 3. No calcifications present. Also, look for cavitary lung lesions on CT images of the trachea that may further point you towards GPA.

How do these key questions apply to tracheobronchopathia osteochondroplastica (TBO)?

1. Diffuse involvement, most common in distal trachea and proximal bronchi 2. Posterior membrane is spared. 3. Presents with multiple calcified and noncalcified nodules that can cause airway narrowing. Calcified nodules are cartilaginous and osseous nodules within the submucosa of the distal tracheal and proximal bronchial walls.

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How do these key questions apply to tracheal amyloidosis?

1. Irregular focal involvement may be most common but this can be focal or diffuse. 2. Can involve posterior membrane. 3. Calcifications very common. Tracheal amyloidosis is usually circumferential and can extend into the bronchi. Heavy calcification is common and you can also see multiple calcified popcorn-like nodules in the lungs with septal thickening and peribronchovascular nodules.

Review: What 2 entities classically spare the posterior membrane and what 2 entities classically do not spare the posterior membrane?

Spare posterior membrane: Tracheobronchopathia osteochondroplastica and relapsing polychondritis. Notice that both of these have “chondro” in their name (well almost at least) which points you to the fact that these are cartilaginous disease. Because you know cartilage is not within the posterior membrane, you can correctly conclude that these spare the posterior membrane. Can involve posterior membrane: tracheal granulomatosis with polyangiitis (GPA) and tracheal amyloidosis.

Can sarcoidosis involve the trachea?

Yes. Sarcoid can involve just about anything in the body. On CT look for circumferential tracheal thickening in setting of mediastinal and hilar lymphadenopathy and perilymphatic nodules in the lungs.

What are key features of post-intubation tracheal stenosis on CT imaging?

Subglottic focal narrowing with circumferential stenosis. This can look like an hourglass configuration on coronal or sagittal CT images.

What is more common: congenital or acquired tracheomalacia?

Acquired tracheomalacia is more common with the most common cause being COPD. Another risk factor is intubation trauma or prolonged intubation which can also result in stenosis. To diagnosis look for >70% airway collapse in expiration on CT or about 50% airway collapse on expiration in bronchoscopy.

What is Mournier Kuhn syndrome?

Another term for Mournier Kuhn syndrome is tracheobronchomegaly. This is severe, massive dilation of the trachea, often dilation of the trachea > 3 cm. Cause is thought to be congenital with absence or atrophy of elastic fibers of trachea. Much more common in men than women. Associated with Ehlers Danlos syndrome and tracheobronchomalacia. Despite being very enlarged the airway also easily collapses with this entity so look for obstructive physiology and recurrent pulmonary infections. Also associated with bronchiectasis in the lower airways.