

1

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60% (1). CT  
40  
(2).  
(Fig. 3).

가

가

가  
가

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(Tracheobronchomegaly, Mounier-Kuhn

Syndrome)

(carina)

10 - 12 cm

(Fig. 1).

CT 1 - 3 mm

(Fig. 2).

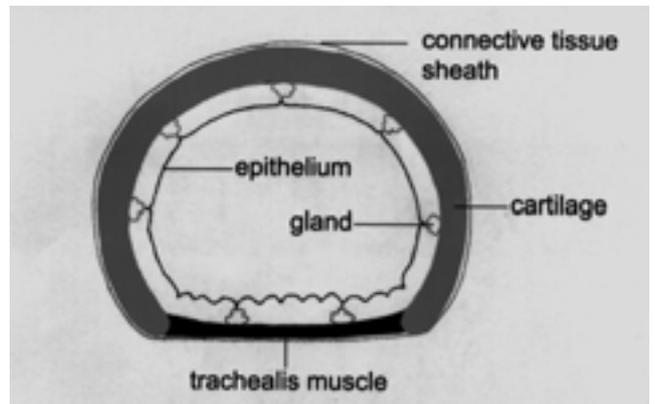


Fig. 1. A schematic drawing of normal trachea.

Ehlers - Danlos

(2).

가 가

20

(3).

(Fig. 4).

2 cm

3 cm,

2.4 cm,

2.3 cm

(3).

saber - sheath

(Tracheobronchopathia

Osteochondroplastica)

가

가 가

(4).

CT

(Fig. 5).

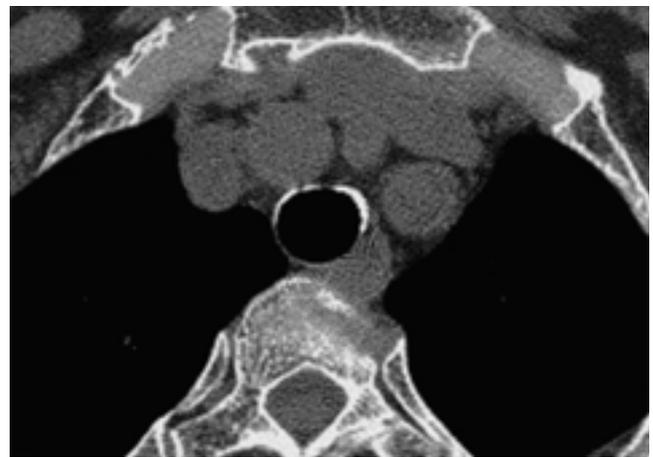
(Relapsing Polychondritis)

acid mucopolysaccharide

가

(5).

50%



**Fig. 3.** A 67-year-old woman with dense calcification of tracheal cartilage. High-resolution CT scan shows calcified cartilage. Posterior tracheal membrane appears thin and uncalcified.



A



B

**Fig. 2.** Cross sectional shape of normal trachea in healthy person.

**A.** Inspiratory high-resolution CT scan shows slightly dense, horseshoe-shaped tracheal cartilage supporting anterior and lateral tracheal walls. Mucosa and submucosa internal to cartilage are not seen on CT scan. Posterior tracheal membrane is relatively thin.

**B.** Expiration results in anterior bowing of posterior tracheal membrane with a decrease in sagittal diameter.

lacunar 가 (6).

(5).

. CT

(Amyloidosis)

. 10 - 20%

(Fig.

(7).

50%

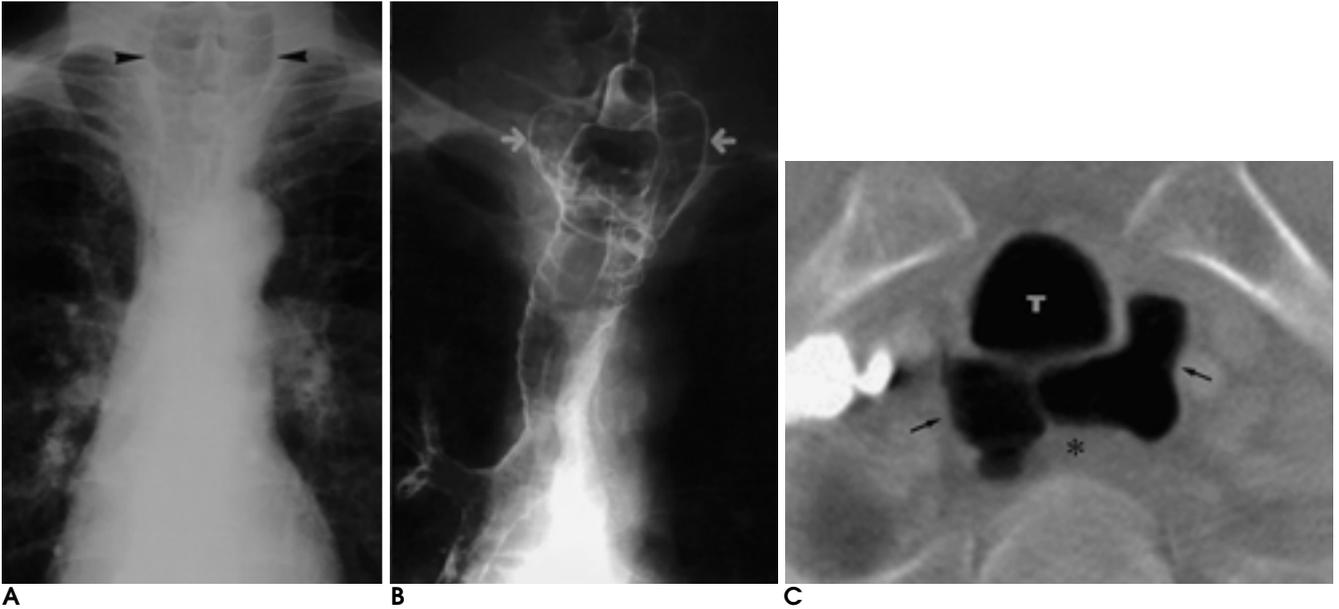
6).

가

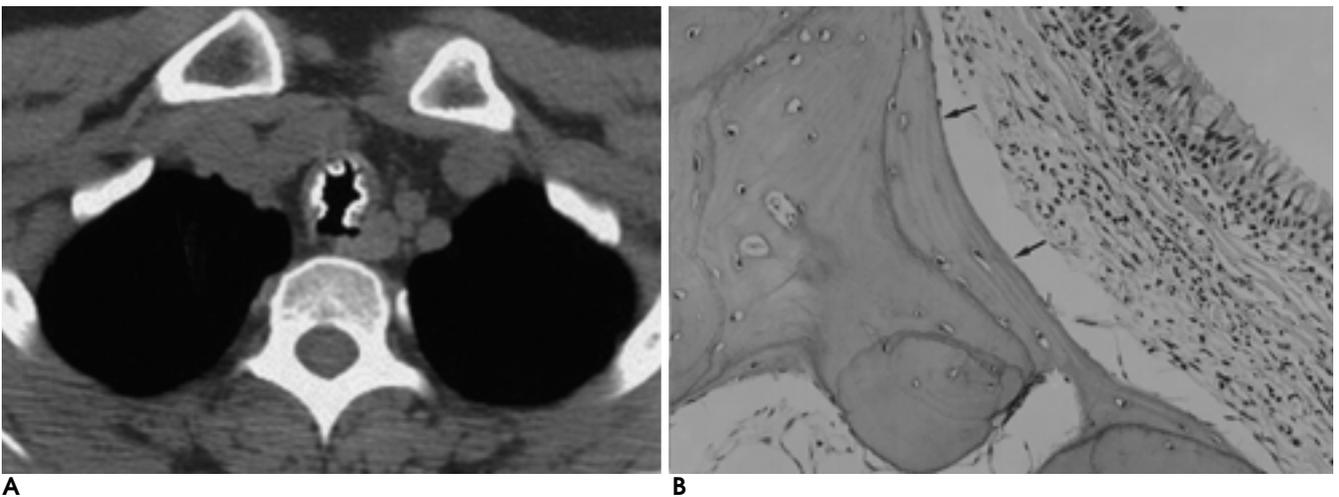
(7).

. CT

(



**Fig. 4.** Tracheobronchomegaly in a 51-year-old man who presented with recurrent pneumonia.  
**A.** Chest PA shows marked dilatation of the trachea with outbulging appearance (arrowheads).  
**B.** Tracheogram with barium reveals tracheal luminal dilatation and diverticula (arrows).  
**C.** CT scan demonstrates multiple saccular outpouching (diverticula) of posterior tracheal wall (black arrows). T = trachea, asterisk(\*) = esophagus.



**Fig. 5.** A 42-year-old woman with tracheobronchopathia osteochondroplastica.  
**A.** CT scan demonstrates calcified nodules protruding into tracheal lumen. Note sparing of the membranous posterior wall. Both main bronchus are also involved (not shown here).  
**B.** Specimen histology (hematoxylin-eosin stain,  $\times 200$ ) shows mature bone formation within submucosal layer (arrows).

)  
(Fig. 7).

(*Wegener's Granulomatosis*)

(6).

가 . CT

(Fig. 8).

(*Tracheobronchial Tuberculosis*)

10 - 20%

(8).

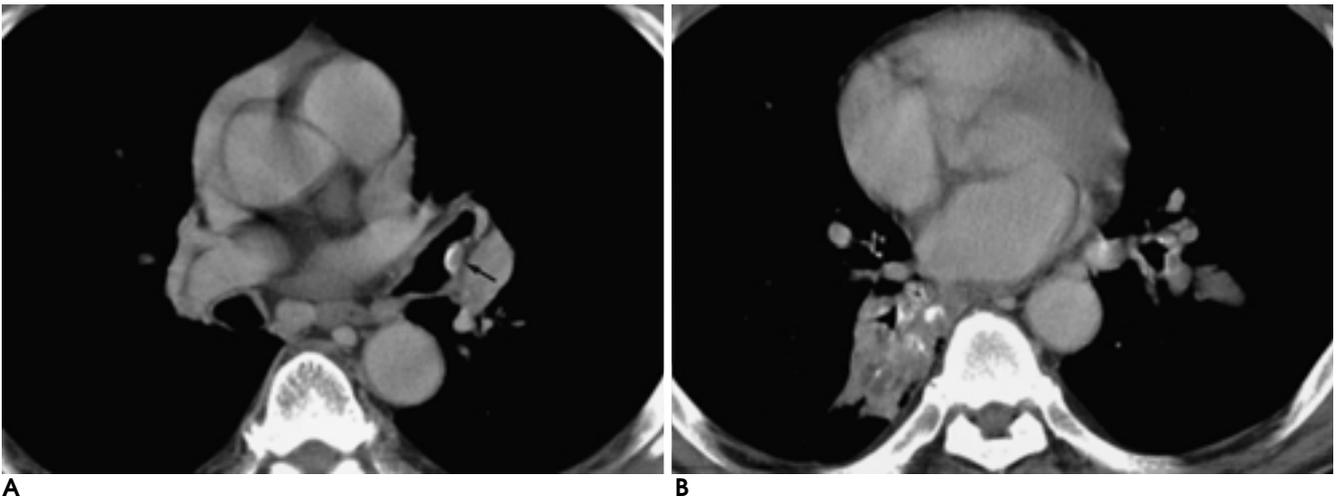


**Fig. 6.** A 48-year-old man with relapsing polychondritis. He had recurrent episodes of arthritis and physical examination revealed destruction of auricular cartilage.

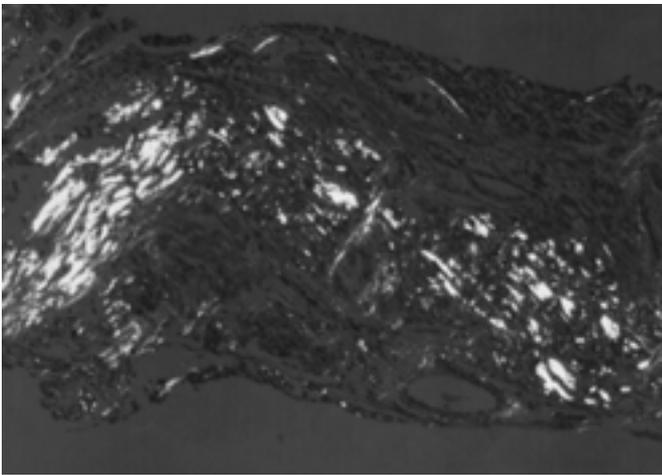
**A.** Chest PA shows diffuse wall thickening and deformity of the trachea (arrowheads).

**B, C.** CT scan of the trachea and main bronchi shows thickening and calcification of the cartilage. Note lung cancer in right upper lobe.

**D.** Shaded-surface-display three dimensional image demonstrates diffuse luminal narrowing and deformity.

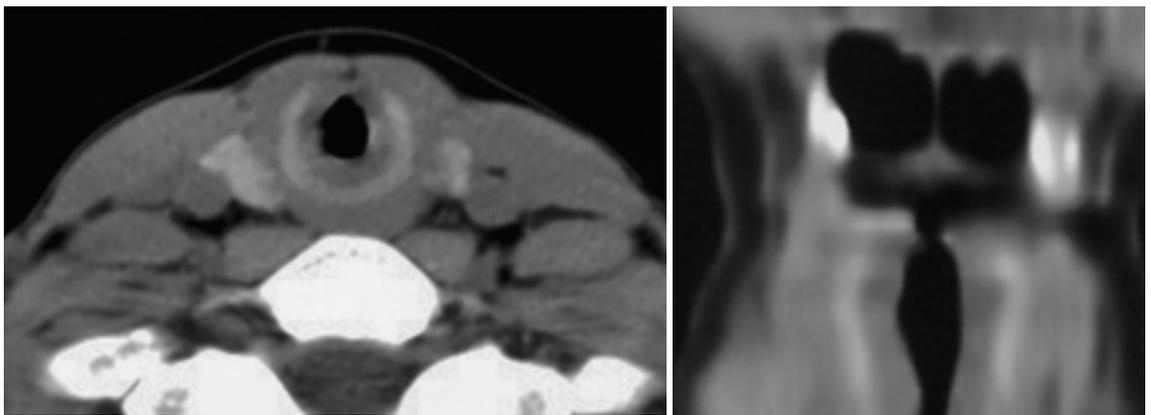


**A** **B**



**C**

**Fig. 7.** Tracheobronchial amyloidosis in a 63-year-old man. He had blood-tinged sputum and dyspnea for four months. **A, B.** CT demonstrates diffuse bronchial wall thickening with concentric calcification. A submucosal nodule is noted in posterolateral wall of left upper lobe bronchus (arrow in A). Smooth wall thickening of distal trachea is also noted (not shown here). **C.** Under polarized light, apple-green birefringence of amyloid is noted within biopsy specimen (Congo red stain,  $\times 200$ ).



**A** **B**

**Fig. 8.** Tracheal involvement of Wegener's granulomatosis in a 19-year-old girl. Diagnosis was established from histologic examination of tissues obtained from the trachea, kidney and skin.

**A.** CT scan at the level of subglottic trachea reveals circumferential thickening of the wall.

**B.** Coronal reformatted image shows diffuse thickening of the tracheal wall.

**B**



CT

CT

50 -

70%

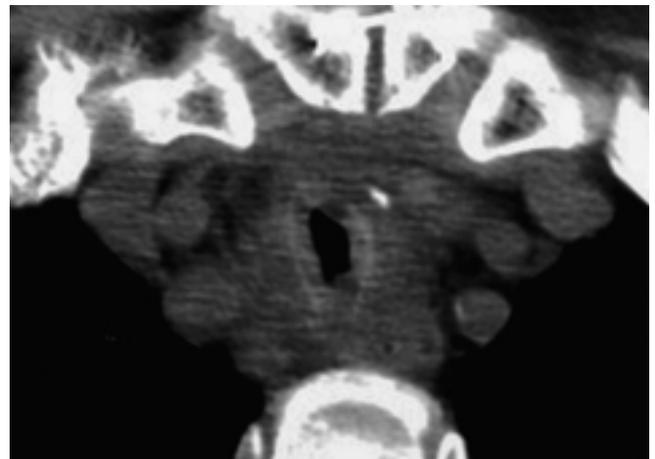
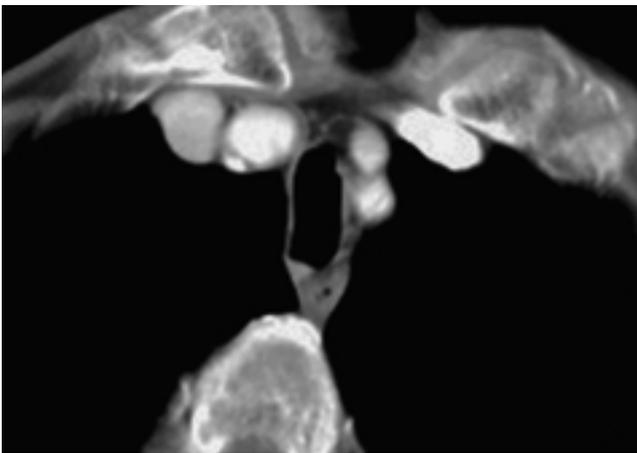
(6) (Fig. 12).

(Tracheomalacia)

(Tracheal Stenosis)

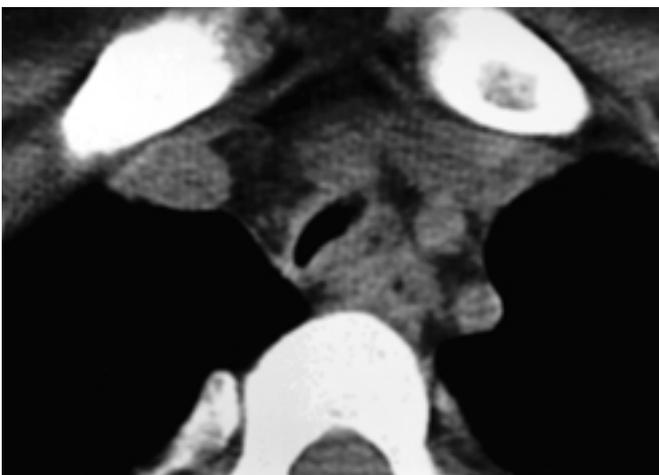
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(8).



**Fig. 11.** A 72-year-old man with history of chronic obstructive pulmonary disease. Translateral narrowing of trachea below thoracic inlet, without thickening of tracheal wall, is typical of saber-sheath trachea.

**Fig. 13.** Acute tracheal stenosis due to granulation tissue in a 29-year-old man. He was intubated for three weeks due to head trauma. Bronchoscopic biopsy revealed granulation tissue. CT scan shows narrowing of tracheal lumen by soft tissue increase inward to tracheal cartilage and thickening of posterior membrane. The cartilage appears normal in shape.

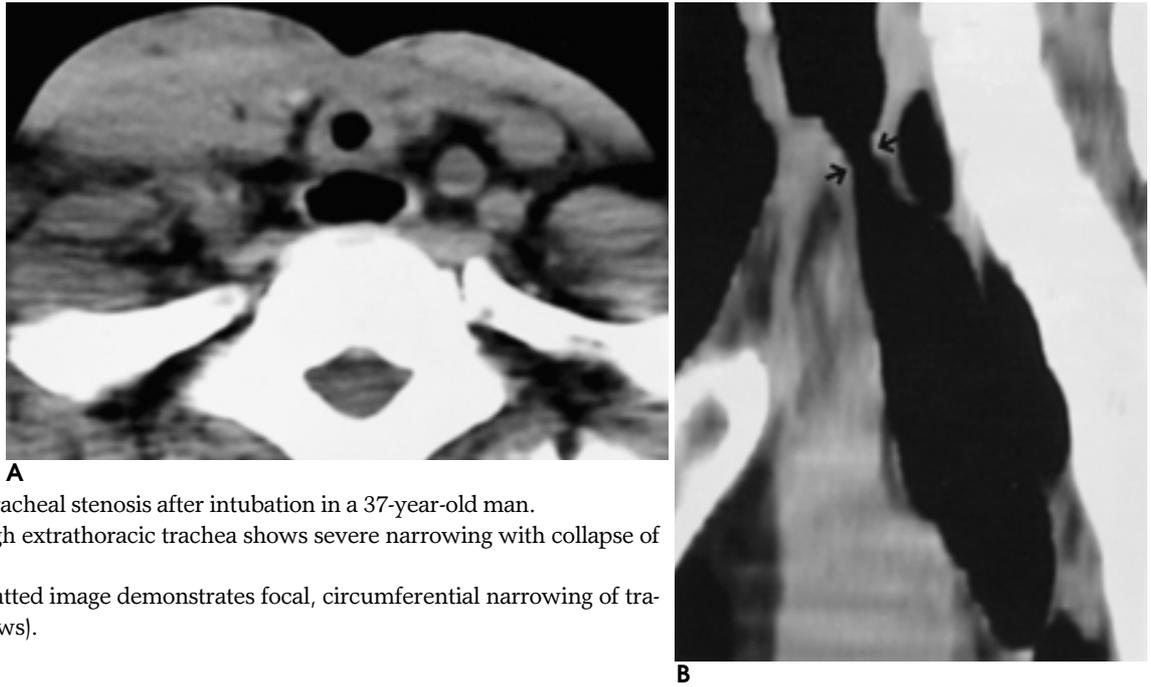


**Fig. 12.** A 36-year-old man with tracheomalacia after prolonged intubation. CT scan obtained after forced expiration (**A**) reveals marked collapse and abnormal decrease in cross sectional area compared with inspiration (**B**) (in this case 72%).

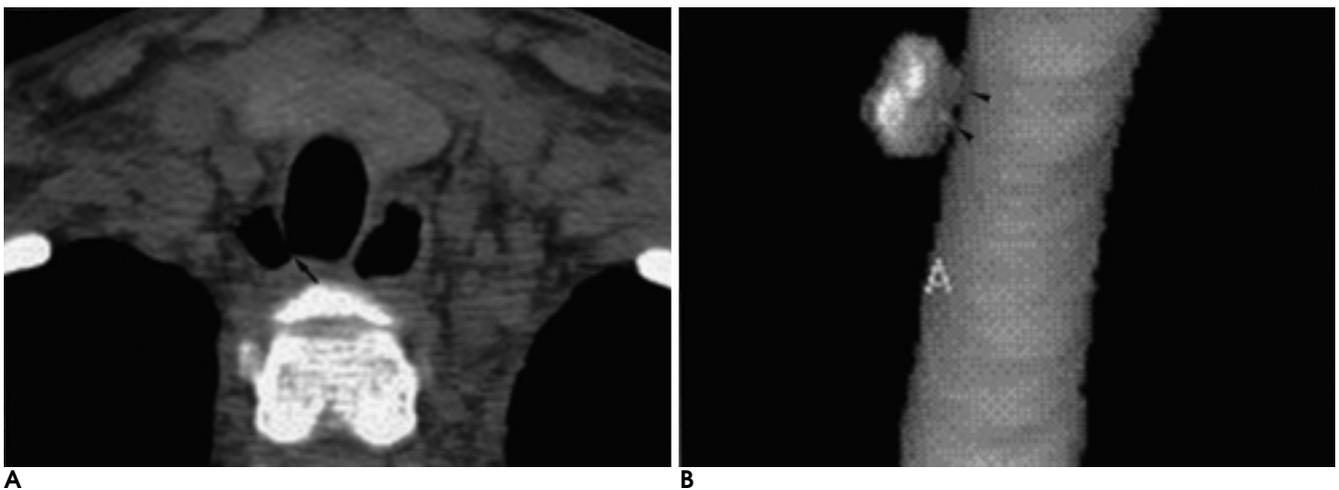
가 , 가 가  
 (6). CT 가 가  
 가  
 1.5 - 2.5 cm . CT (Tracheal Diverticulum)

(2, 9) (Fig. 13, 14). CT

가 (10). saber -



**Fig. 14.** Chronic tracheal stenosis after intubation in a 37-year-old man.  
**A.** CT scan through extrathoracic trachea shows severe narrowing with collapse of the cartilage.  
**B.** Sagittal reformatted image demonstrates focal, circumferential narrowing of tracheal lumen (arrows).



**Fig. 15.** Tracheal diverticulum in a 22-year-old man. He has suffered from prolonged, severe cough due to bronchial compression by thymic lymphoma.  
**A.** Axial CT scan at the level of thoracic inlet shows right paratracheal air cyst with communicating channel (arrow) to tracheal lumen.  
**B.** Anterior view of shaded-surface-display 3D image of the trachea demonstrates diverticulum and its communication with the tracheal lumen (arrowheads).

sheath

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CT  
(Fig. 15).

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## Imaging Features of Nontumorous Conditions Involving the Trachea and Main-stem Bronchi<sup>1</sup>

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A number of nontumorous diseases may affect the trachea and main-stem bronchi, and their nonspecific symptoms may include coughing, dyspnea, wheezing and stridor. The clinical course is often long-term and a misdiagnosis of bronchial asthma is common. The imaging findings of these nontumorous conditions are, however, relatively characteristic, and diagnosis either without or in conjunction with clinical information is often possible. For specific diagnosis, recognition of their imaging features is therefore of prime importance. In this pictorial essay, we illustrate the imaging features of various nontumorous conditions involving the trachea and main-stem bronchi.

**Index words :** Bronchi, diseases  
Trachea, CT  
Trachea, diseases  
Trachea, stenosis or obstruction

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