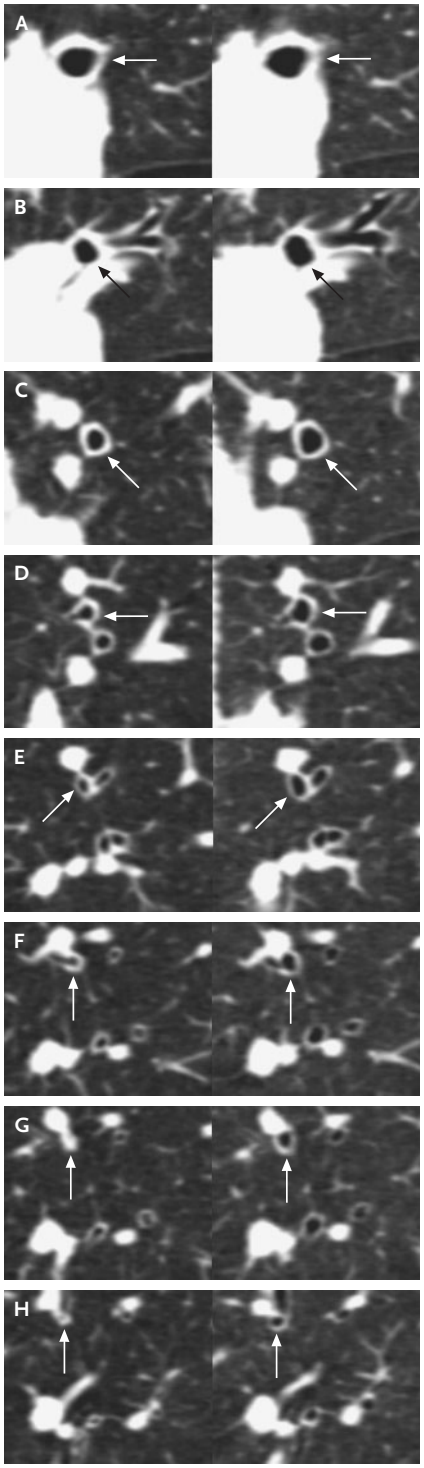
IMAGES IN CLINICAL MEDICINE

Airway Dilatation after Inhalation of a Beta-Agonist



A 37-year-old woman with a 25-year history of asthma that had been managed with inhaled budesonide and albuterol (salbutamol) as needed underwent high-resolution multislice helical computed tomographic scanning. Thirty minutes after the inhalation of albuterol, a cross-sectional multiplanar reconstruction of the right upper lobe, obtained at maximal inspiration, revealed an increase in the airway caliber. Each panel of images from these two videos consists of the view before the inhalation on the left and the corresponding view after the inhalation on the right. Panel A shows the segmental, or third-generation, bronchus (arrows); Panel B the fourth-generation bronchus at the branching point (arrows); and Panel C more of the periphery of the fourth-generation bronchus, with full wall visualization (arrows). Panels D, E, F, and G show bronchial divisions from the fifth to the eighth generation (arrows); the same bronchial divisions are shown in the video clip. Panel H shows preinhalation airway occlusions (left-hand image), which opened up after the inhalation (right-hand image). The forced expiratory volume in one second, initially 1.27 liters (49.8 percent of the predicted value), increased by 0.49 liter after the inhalation of albuterol. It is important to note that airway resistance is an inverse function of the airway radius to the fourth to fifth power.

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