Role of Multi-detector CT in Imaging of Different Tracheal Lesions

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By

Dr. Ghofran Mohammed Sayed Saleh

M.B., B.Ch.

Supervised By

Prof. Dr. Samer Malak Botros

Professor of Radio diagnosis
Faculty of Medicine
Ain Shams University

Prof. Dr. Mennatallah Hatem Shalaby

Assistant Professor of Radio diagnosis
Faculty of Medicine
Ain Shams University

Faculty of Medicine
Ain Shams University

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List Of Abbreviations

Abbreviation	Full
CT	Computed topography
2D	Two dimensional
3D	Three dimensional
TOF	Tracheio-oesphgeal fistula
TBM	Tracheo-broncho-malacia
TM	Tracheo-malacia
SCC	Squamous cell carcinoma
COPD	Chronic obstructive pulmonary disease
VB	Virtual bronchoscopy
SCC	Squamous cell carcinoma

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ABSTRACT

Introduction

The advent of multi-detector CT has revolutionized imaging of the airways and other thoracic structures. In comparison to single-detector helical CT scanners, multi-detector scanners not only provide faster speed, greater coverage, and improved spatial resolution, but also have the unique ability to create images of thick and thin collimation from the same data set (**Hu etal. 2000).**

Aim of the Work

The aim of this work is to highlight the role of multi-detector CT in distinguishing the features of different tracheal lesions.

Key words

Trachea – computed topography – multi-detector – lesions.

Introduction

The advent of multi-detector CT has revolutionized imaging of the airways and other thoracic structures. In comparison to single-detector helical CT scanners, multi-detector scanners not only provide faster speed, greater coverage, and improved spatial resolution, but also have the unique ability to create images of thick and thin collimation from the same data set (**Hu etal. 2000).**

One of the greatest benefits of this new technology is the improved quality of two-dimensional (2D) multi-planar and three-dimensional (3D) reconstruction images. These images break away from the confines of the traditional axial imaging plane and have the potential to facilitate the assessment of a variety of airway disorders (**Hu etal. 2000).**

With regard to the assessment of airway stenosis, multi-planar volume reformation methods aid in the detection of mild stenosis, improve the accuracy of determining the length of stenosis, and aid in the identification of horizontal webs. Review of multi-planar volume-reformatted images has been shown to aid in the planning of stent placement or surgery (**Hu etal. 2000).**

Airway imaging is routinely performed at end-inspiration during a single breath-hold. State-of-the-art helical scanners allow the entire central airways to be imaged in less than 5 sec. The speed of the examination is particularly important when imaging patients with airway disorders because many of these patients cannot tolerate the significantly longer breath-hold time required by single-detector CT scanners (**Choi & Boiselle, 2001).**

Short scanning time is also an advantage for imaging during dynamic breathing or at end expiration in patients with suspected trachea-malacia a condition characterized by excessive collapse of the airway during expiration(**Choi & Boiselle, 2001).**

Tracheal stricture caused by damage from cuffed endotracheal tube, tracheostomy or trauma to the neck. Cuff pressure in these devices may exceed the capillary pressure leading to ischemic necrosis and subsequent fibrosis. Assessment of such localized tracheal abnormality can be achieved with contagious 1.5-5.0 mm collimation scans obtained through the area during a single breath hold (**Choi& Boiselle, 2001).**

Relapsing polychondritis is a systemic disease in which the tracheal cartilage is affected by recurrent episodes of inflammation. On CT images, fixed narrowing of the tracheal lumen with associated thickening of the wall is noted (**Choi& Boiselle, 2001).**

Amyloidosis is a condition in which a fibrillar protein is deposited in the trachea. Tracheal involvement takes the form of diffuse or multifocal sub-mucosal infiltrates. On CT scan, narrowing of the lumen, wall thickening and calcification is noted (**Choi& Boiselle, 2001).**

Tracheomalacia is a clinical disorder associated with softening of the cartilage and loss of structural integrity of the trachea. Both primary and secondary etiologies are recognized. In pediatric patients, prematurity or prolonged mechanical ventilation is often implicated. In adults, many cases are posttraumatic or post-inflammatory with or without complicating infections **(Gaissert & Burns, 2010**)**.**

Tracheo-pathia-osteo-chondroplastica is a rare idiopathic and usually asymptomatic disorder of older men; this disorder is characterized by multiple osteo-cartilaginous masses adjacent to the tracheal rings of the inner anterolateral wall of the trachea. Radiologically, focal tracheal thickening, calcification of the tracheal rings, multiple calcified tracheal nodules, and long-segment tracheal narrowing are typically seen **(Carden etal. 2005).**

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