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Original Article

Cystic lesions in multislice computed tomography of the chest: A diagnostic approach

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ABSTRACT

Purpose: To evaluate the role of Multislice Computed Tomography (MSCT) in the detection, diagnosis and differentiation of possible causes of chest cystic lesions using different capabilities of MSCT.
Patients and methods: The study involved 43 patients. Clinical examination, history taking, relevant laboratory data, pulmonary function test if needed, together with different techniques of MSCT according to the assessed case were done to reach the possible diagnosis, and then pathology assessment was needed in 11 cases.
Results: MSCT showed that 30 (70%) of cases were lung cysts, 5 (12%) of cases were mediastinal, 4 (9%) of cases were pleural and 4 (9%) of cases were chest wall. 25 (42%) of cases were with single cyst and 18 (58%) of cases were with multiple cysts. 23 (47%) of cases were with air containing cysts and 20 (53%) of cases were with fluid containing cysts. We discussed the differentiating MSCT features of various cystic lesions and the approach used to reach final diagnosis.
Conclusion: Cystic lesions of the thorax have a wide range of differential diagnosis, and to reach the cause a multidisciplinary approach should be done. The role of MSCT imaging is essential in diagnosis and evaluation of different chest cystic lesions.

1. Introduction

A cyst is any circumscribed lucency (air filled) or low-attenuating area (fluid filled) with surrounding thin-wall less than 2 mm [1]. Lung cysts present a diagnostic challenge due to the increasing number of diseases associated with this presentation. Chest radiography is not a sensitive modality for patients with pulmonary cysts [2]. MDCT is the main diagnostic imaging for cystic lesions that provide good spatial resolution. It enables imaging of a large tissue volume in a short acquisition time, reducing the effect of respiratory motion in the thorax, and it helps to define the morphological aspects and distribution of lung cysts, as well as associated findings. CT reveals bony involvement and helps in narrowing the broad differential diagnosis [3]. The combination of imaging, and the clinical features, with the extrapulmonary manifestations, when present, permits proper and accurate diagnosis of the majority of these diseases without need of open lung biopsy [2].

Cystic lesions could be encountered in the pulmonary parenchyma, pleura, mediastinum and chest wall [4].

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Pulmonary cysts could be focal, multifocal or diffuse. The differential diagnosis of focal and multifocal lung diseases includes pneumatoceles, congenital cystic lesions, traumatic lesions (post laceration cyst), several infectious processes, including Pneumocystis carinii pneumonia, cicatricial collapse, cystic bronchiectasis, and hydatid disease, post pulmonary infarction cysts, and malignant lesions, including metastatic lesions which may rarely present as cystic lesions [1,5].

Many diffuse lung diseases, interstitial lung disease (ILD), may manifest with cysts as the primary abnormality, as lymphangioleiomyomatosis (LAM) and pulmonary Langerhans cell histiocytosis (PLCH), or as associated abnormality in lymphocytic interstitial pneumonia (LIP) and desquamative interstitial pneumonia (DIP) [6]. Other diffuse pulmonary cystic lesions are not related to ILD as Birt-Hogg-Dubé syndrome (BHD) which is an autosomal dominant disorder associated with renal tumor and skin lesions [7].

Cystic lesions of the pleura including encysted pleural effusion, empyema, para-pneumonic collection and encysted pneumothorax are not uncommon. Contrast enhanced Computed Tomographic scan should be performed to diagnose pleural lesion, and evaluate the underlying problems, as pleural nodules or thickening [8].

Mediastinal cysts comprise 15–20% of all mediastinal masses and occur in all compartments of the mediastinum. They include bronchogenic cysts, esophageal duplication cysts, pericardial cysts, neurenteric cysts, meningocele, lymphangioma, thymic cysts, cystic teratoma, other cystic tumors such as cystic schwannoma, vascular anomalies, hematoma, abscess, caseating lymph nodes as with tuberculosis, hydatid cyst, and pancreatic pseudocyst [4,9].

Chest wall cystic lesions such as cystic hygroma, hematoma, abscess, tuberculous and hydatid cyst are best evaluated by CT scan [3].

The purpose of this study was to evaluate the role of MSCT in the detection, diagnosis and differentiation of possible causes of chest cystic lesions using different capabilities of MSCT allowing multiplanar reformatting.

2. Patients and methods

2.1. Patients

This study involved 43 patients: 26 males and 17 females, with age range 15–70 years (average of 39.305 years).

Patients were referred to Radiology Department of Cairo University Hospital from the chest department and clinics for MSCT assessment of cases presented by different chest manifestations, from November 2014 to November 2015.

2.2. Methods

Prospective evaluation of CT chest during study period and cases with cystic lesions was included in our study and then a multidisciplinary approach was performed to reach correct diagnosis, as each patient was subjected to the following:

1. Clinical data: history taking (age, sex, occupation, residence and special habits with detailed smoking history). Clinical: general and chest examinations were done.
2. Multislice Computed Tomography (MSCT) chest was done to all patients using 16 channels MSCT in the Radiology Department in Cairo University. Contrast enhanced computed tomography (CECT) was done to 26 cases, in suspected mediastinal lesions, neoplastic lesions as well as chest wall lesions. High resolution computed tomography (HRCT) was done to 13 cases in suspected diffuse and interstitial lung disease (ILD). Non-enhanced computed tomography (NECT) was done in 4 cases in equivocal cases.

CT technique: Siemens Emotion MSCT 16:

Scout	kV 110 mA 25 Holding breath
Scan type	Helical
Detector row	16
Helical thickness	1.0 mm
Interval	1.0 cm
FOV	351 mm
kV	110
mA	25
Total exposure time	0.8 s
Scanning direction	Bottom to top
Holding breath in full inspiration	
Reconstruction type: STD (standard)	
Mediastinal and lung window images are taken	
Contrast	Non-ionic contrast, iodine conc. 350, 40–50 ml 3 ml/s, pressure 250
Fasting 6 h before the examination	
Volumetric evaluation in HRCT with Two dimensional reconstruction in coronal and sagittal planes	

3. MSCT evaluation, regarding cyst site, number, content, size and shape.
4. Comparison with previous available studies.

2.3. Inclusion criteria

CT chest were assessed and cases with cysts were included in this study within the study period.

2.4. Exclusion criteria

The exclusion criteria were cyst mimics as bullae and blebs in emphysema and cavitary lesions as abscess, fungal, tuberculous thick wall cavitary lesions.

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