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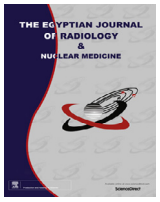

Original Article

# 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<br>mA 25<br>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<br>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.

### 2.5. Method of evaluation

The cyst CT appearance was evaluated for the following:

a. Site: lung, mediastinum, pleura or chest wall.
b. Number: single or multiple.
c. Content: air or fluid.
d. Size.
e. Shape.

4- Different laboratory tests and other studies were considered according to the case e.g. tuberculin test, assessing for hydatid disease. PFT was done in 4 cases suspected of having chronic diffuse infiltrative lung disease (CDILD).

5- Pathological assessment was done to 11 patients.

## 3. Results

This study involved 43 patients with cysts: 26 males and 17 females, with age range 15–70 years (average of 39.305 years), detected in their MSCT of the chest.

The distribution of cysts at MSCT chest is displayed in Fig. 1.

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.

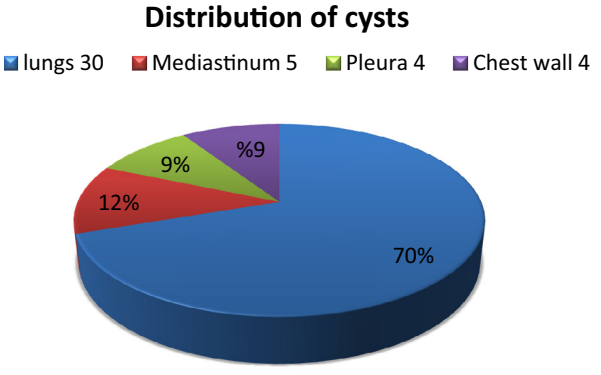


**Fig. 1.** The distribution of cysts in MSCT chest.

### 3.1. Lung cysts

Thirty cases had lung cysts: 19 males and 11 females, with predominant age group 20–29 years old (Fig. 2). 23 cases were with air containing cysts and 7 cases were with fluid containing cysts. Single cyst was in 12 cases (Table 1), (Figs. 3 and 4). Multiple cysts was in 18 cases (Table 2), (Figs. 5–7).

### 3.2. Mediastinal cysts

Five of our cases had mediastinal cysts: 3 males and 2 females, and their age range was 19–60 years (average 31 years). All mediastinal cysts were single and contained fluid. Table 3 summarizes the types of mediastinal cysts (Fig. 8).

### 3.3. Pleural cysts

Four of our cyst cases were pleural in nature, 2 males and 2 females, and their age range was 30–60 years (average 47.5 years). Multiplanar CT chest proved that all cases were loculated effusion. The distribution of lesions along the pleura is shown in Fig. 9.

### 3.4. Chest wall cysts

Four of our cases had chest wall cysts, 2 males and 2 females, and their age range was 44–52 years (average 38.5 years). All chest wall cysts were single and contained fluid.

The types of chest wall lesion are summarized in Fig. 10. Two cases of chest hematoma had history of chest trauma. The case diagnosed as empyema necessitans had empyema which showed loculated posterolateral pleural fluid with thick enhanced margin and evident chest wall extension. The case of tuberculous abscess showed right pleural effusion, extensive chest wall involvement and right breast collection.

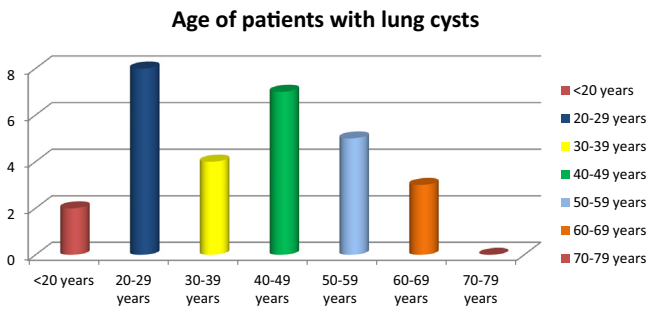


**Fig. 2.** The number of patients per age group with lung cysts.

**Table 1**
Types of cases with single lung cyst prevalence and approach used to reach diagnosis.

| Focal cystic lung disease | No. of cases | % of cases | Clinical features | CT technique | Cyst distribution | Cyst characteristic | Other computed tomographic findings | Need for other investigation |
|---|---|---|---|---|---|---|---|---|
| Echinococcal infection | 3 | 25% | Cough, incidental, travel history | NECT/ CECT | Focal or multifocal. Lower lobe predominance | Variable sizes; regular shapes; can be multiloculated; fluid hypodense contents | Complicated cyst show air-fluid levels, daughter cysts, floating membranes, meniscus or onion peel signs Associated hepatic cysts | Hydatid serological tests |
| Post inflammatory | 3 | 25% | Productive Cough, dyspnea, fever, history of endocarditis | NECT | Focal or multifocal | Variable sizes, irregular shapes | Cavitary lesions, parenchymal bands | Comparison with previous chest studies |
| Post infarction (Fig. 3A) | 2 | 17% | Chest pain, history of Behçet disease | CECT | Focal or Multifocal | Well defined, rounded or oval shape, their pattern change rapidly | Pulmonary embolism, surrounding and associated with peripheral consolidation and atelectasis | Comparison with previous chest studies |
| Simple (Fig. 4) | 2 | 17% | Incidental | NECT | Focal | Well defined, homogenous, fluid containing | | Pathological evaluation |
| Post laceration (Fig. 3B) | 1 | 8% | History of chest trauma 2–3 days before | NECT | Focal single or multiple | Air or blood filled cyst, with or without air-fluid levels | Associated fracture ribs and surrounding pulmonary contusion | Comparison with previous chest studies |
| Inflammatory/ pneumatocele | 1 | 8% | Constitutional symptoms | NECT | Focal single or multiple | Usually large, thin wall variable shape cyst | Surrounding parenchyma pneumonia, loculated effusion | |

HRCT: High resolution Computed Tomography, NECT: Non-Enhanced Computed Tomography, CECT: Contrast Enhanced Computed Tomography.

## 4. Discussion

A cyst is a round circumscribed space that is surrounded by an epithelial or fibrous thin wall [1]. Cysts are commonly encountered in the pulmonary parenchyma, and could be encountered in the pleura, mediastinum and chest wall [5]. Cysts in the lung usually contain air, but occasionally contain fluid or solid material [2]. Cysts are known to occur with increasing frequency with advancing age, and are not normally expected in healthy individuals aged less than 50 years [10]. The peak incidence varies among the diseases, but typically falls in the third or fourth decade of life [2].

Multislice computed tomography (MSCT) with multiplanar reconstructed images provides a unique perspective on thoracic anatomy and disease [3]. Chest HRCT is the imaging modality of choice to detect and differentiate among the various causes of diffuse cystic lung disease. Important HRCT findings that should be taken into consideration when evaluating patients with diffuse cystic lung disease include the following: lung volume; size, wall thickness, shape and distribution of pulmonary cysts; and associated findings, such as pulmonary nodules, septal thickening, pleural effusion, lymphadenopathy and extrathoracic abnormalities [2].

Francisco et al. stated that to make the correct diagnosis, use of a multidisciplinary approach that takes into consideration the patient's clinical history, physical examination findings, and radiologic appearance is important, as well as comparison with previous imaging studies, when available [2], and Ha et al. described that the characterization of pulmonary cysts and their distribution play a key role in diagnosis, and they used the following steps to reach diagnosis, step 1: rule out cyst-mimics, step 2: characterize the clinical presentation, step 3: characterize the radiographic features, step 4: put it all together [11]. Both met with the diagnostic approach used in our study to reach final diagnosis.

All patients with different types of cystic lesions have similar non-specific chest symptoms such as pain, cough, and shortness of breath [2].

In this study, hydatid lung cysts account for 25% of single lung cysts and the three patients presented by cough. Darwish 2006 reported that the most frequent symptom in pulmonary hydatid disease was cough [12], which is more or less consistent with the current study. Diagnosis is made based on the characteristic radiologic findings supported by serological test for hydatid and confirmed by operative findings. All our cases had associated liver affection. In a study by El Khattabi et al., 2012, they stated that MSCT examination is the modality of choice in assessment of pulmonary hydatid disease allowing a precise study of the cyst, specific location and so determining the best surgical approach, detecting the complication, and allowing to rule out other etiologies. It can detect small cysts to determine their evolutionary stage, and especially to make a full assessment of other sites possible chest cyst that may go unnoticed to the standard radiography [13].

In the current study, post inflammatory and post traumatic cysts were found in three cases (25% of the single

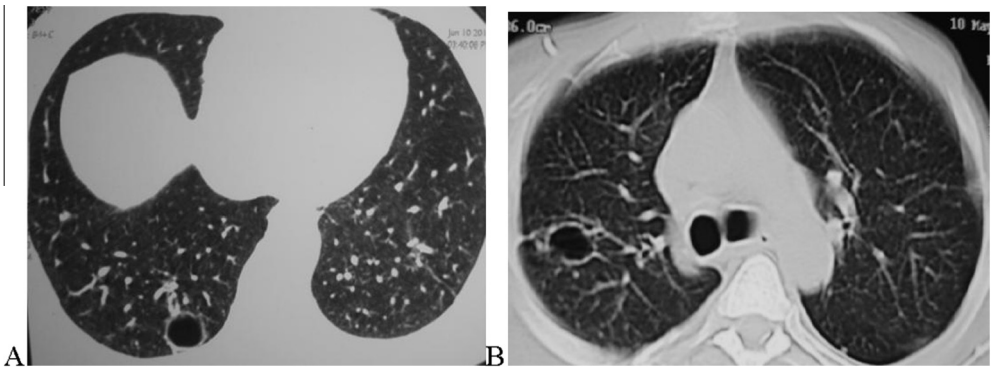

**Fig. 3.** Two examples of single air containing cysts. (A) Male patient 28 years old, known case of Behçet disease, CT chest axial lung window image shows a post infarction air-containing cyst in the right lower lobe. (B) Male patient 35 years old with history of chest trauma few weeks before, CT chest lung window axial image shows right upper lobe post laceration lung air-containing cyst.

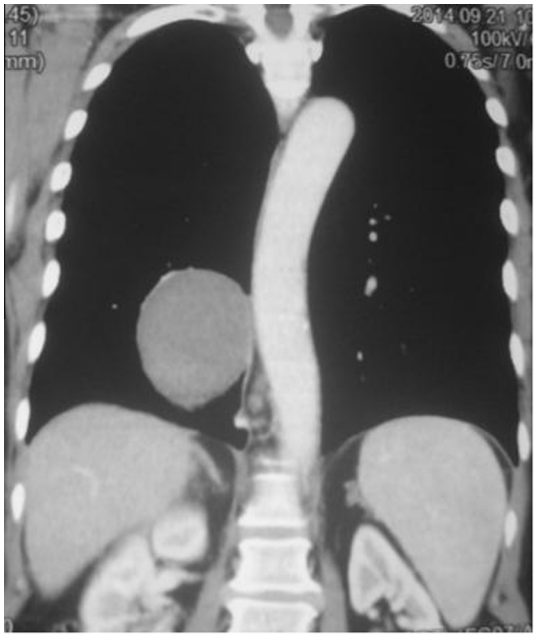

**Fig. 4.** A fluid containing single cyst in a male patient 70 years old, CT chest reconstructed coronal image shows a large fluid-containing cyst in the right lower lobe. Suspected hydatid disease, however, pathology revealed a simple lung cyst.

lung cysts). Acquired cysts with an inflammatory cause, are described in the literature. Caksen et al., 2000 studied thirty-two patients with secondary pulmonary pneumonia due to sepsis and they found that 21% of cases had acquired post inflammatory cysts [14]. In accordance with this study, post inflammatory cysts were secondary to endocarditis in one patient and post pneumonic squeal in the other two patients.

Yang et al., 2010 reported that in cases of blunt chest trauma, CT is more sensitive than radiography for the detection of pulmonary laceration and pneumothorax. CT is therefore suggested in patients with sustained atypical presentation of traumatic cyst. Imaging findings may reveal single or multiple lung cysts located in single or multilobular areas, usually sparing the lung apices. Patchy infiltrates of lung contusion and oval densities of hematoma may also be present [15].

Diffuse infiltrative lung diseases in the current study represent 50% of multiple lung cysts. The predominant high-resolution computed tomographic (HRCT) findings in patients with LAM were multiple thin-walled regular cysts distributed diffusely throughout the lungs with relatively normal lung parenchyma among the cysts, however HRCT findings in PLCH were irregular (bizarre) cysts predominantly upper lobar with nodule and abnormal intervening lung parenchyma [2]. The accuracy of CT diagnosis of UIP was 100%, and honeycombing was seen in all thirty-four interpretations (100%) of usual interstitial pneumonia, a lower lung zone predominance in 94%, and traction bronchiolectasis in 88% [16]. The HRCT findings in twenty-two LIP patients were ground glass attenuation and poorly defined centrilobular nodules, and cystic changes were noted in 68% of patients. Cysts were bilateral in ten patients and unilateral in five patients, and had a random distribution involving less than 10% of the lung parenchyma [16,17]. Ground glass attenuation was the most common radiographic abnormality in DIP and cystic changes have been reported in 32–75% of patients. The cysts in DIP were typically lower lung zone predominant, involve less than 10% of the parenchyma and often appeared within areas of ground glass attenuation in smoker patients [18].

Pulmonary metastases commonly take the form of solid nodules. However, only few cases of cystic pulmonary metastases have been reported. We reported two cases of cystic metastasis in this study. One was a young male with osteosarcoma and the other was an old lady with endometrial stromal sarcoma. Songur et al., 2005 reported a case of young male with osteosarcoma. CT chest one year after the surgery revealed multiple lung cyst and had been proved histopathology to be metastatic osteosarcoma [19]. Murakami et al., 2014 reported a case of cystic pulmonary metastasis in patient with endometrial stromal sarcoma of the uterus [20]. Hasegawa et al., 1999 described three possible mechanisms for the development of malignant cysts: (1) excavation of a nodular tumor through discharge

**Table 2**
Types of cases with multiple lung cysts prevalence and approach used to reach diagnosis.

| Multiple cystic lung disease | No. of cases | % of cases | Clinical features | CT technique | Cyst distribution | Cyst characteristics | Other computed tomographic findings | Need for other investigation |
|---|---|---|---|---|---|---|---|---|
| Diffuse infiltrative lung disease (ILD) including UIP (Fig. 5A), LAM (Fig. 6A), PLCH (Fig. 6B), DIP, LIP | 9 | 50% | Long history of dry cough, dyspnea, chest pain, history of smoking with PLCH & DIP. Female in LAM. Autoimmune disease in LIP | HRCT | Bilateral near symmetrical, UIP: lower lobes | UIP: honeycombing; cluster of subpleural cysts | UIP: surrounding pulmonary fibrosis with reticulations | PFT, pathological evaluation in equivocal cases |
| | | | | | PLCH: upper lobes. LAM diffuse. LIP: perivascular | LAM: mainly rounded cysts | LAM: normal intervening lung, may pneumothorax, chylothorax | |
| | | | | | | PLCH: bizarre shape cysts and nodules | LIP: may ground glass, interlobar septal thickening & centrilobular nodules | |
| | | | | | | LIP: large, few & may subpleural, round cysts<br>DIP: small, few & peripheral cysts | DIP: diffuse ground glass opacities | |
| Cicatricial collapse | 3 | 17% | Dyspnea, cough, with history of chronic tuberculosis or ILD | NECT | Multiple, Localized often upper lobe in tuberculous patient or diffuse in patient with ILD | Variable sizes and shapes | Diminished lung volume, surrounding pulmonary lung fibrosis, ipsilateral mediastinal shift, compensatory hyperinflation of adjacent lung | Tuberculin test, Comparison with previous chest studies |
| Post inflammatory (Fig. 7A) | 2 | 11% | Cough, dyspnea | NECT | Focal or multifocal | Variable sizes, irregular shapes | Cavitary lesions, parenchymal bands | Comparison with previous chest studies |
| Metastasis (Fig. 7B) | 2 | 11% | History of primary malignancy | CECT | Usually multifocal asymmetric | Variable sizes and shapes, air or fluid containing cysts | Associated nodules or masses | Pathological evaluation |
| Bronchiectasis (Fig. 5B) | 1 | 5.5% | Productive cough, recurrent infection | HRCT | Single lobe or multilobar, multiple | Bronchial dilatations; cystic type. Relatively thick wall Air filled, mucus plugging, air-fluid levels. Differentiated from cysts by their continuity with airways | Surrounding pulmonary oligaemia | |
| Cystic adenomatoid malformation | 1 | 5.5% | Recurrent infection | NECT | Usually multiple, can be single large | Single segment or lobe | May be associated other congenital anomalies | Pathological evaluation |

HRCT: High Resolution Computed Tomography, NECT: Non-Enhanced Computed Tomography, CECT: Contrast Enhanced Computed Tomography, ILD: Interstitial Lung Disease, UIP: Usual Interstitial Pneumonia, LAM: Lymphangioleiomyomatosis, PLCH: Pulmonary Langerhans Cell Histocytosis, DIP: Desquamative Interstitial Pneumonia, LIP: Lymphocytic Interstitial Pneumonia.

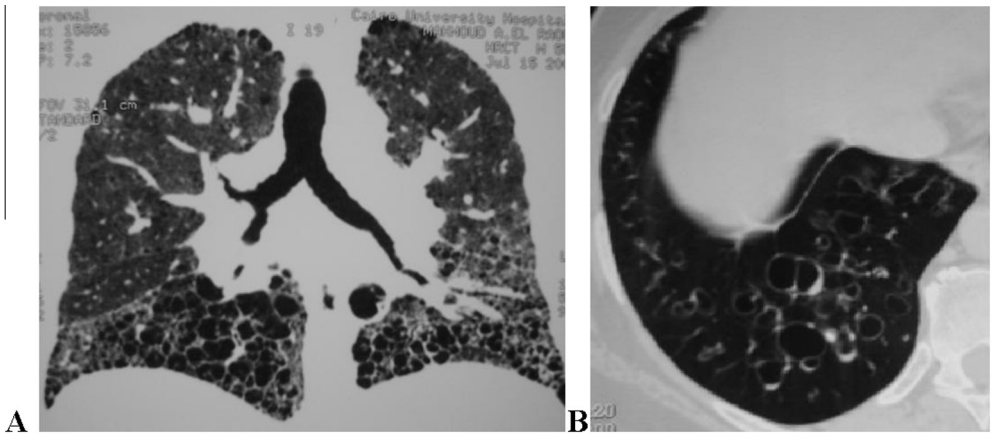

**Fig. 5.** Two patients with multiple cysts. (A) Male patient 55 years old with IPF. HRCT coronal reconstructed images showing bilateral fairly symmetrical subpleural predominately lower lobar clusters of cysts denoting honeycombing; UIP. (B) Male patient 32 years old, CT chest, lung window, of right lower lobe showing cystic bronchiectasis surrounded by marked oligaemia.

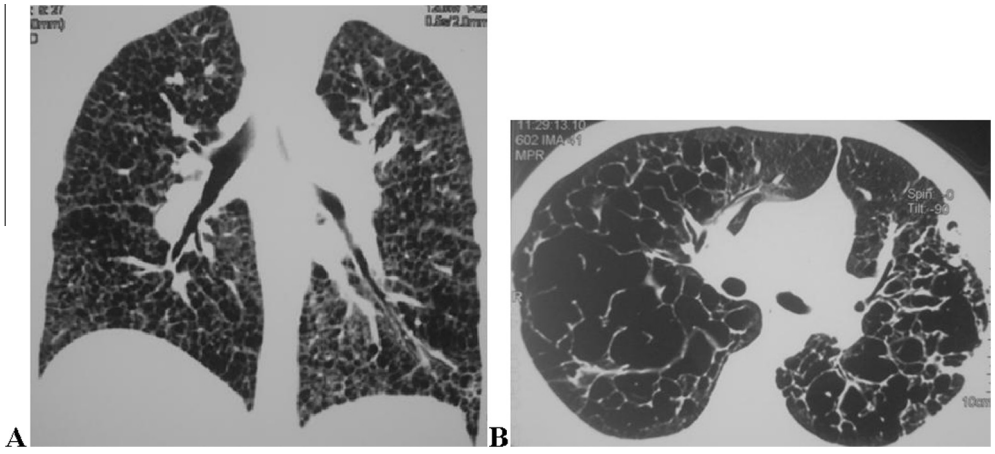

**Fig. 6.** Two patients with bilateral diffuse cysts. (A) Female patient 40 years old with LAM. HRCT coronal reconstructed image showing bilateral fairly symmetrical numerous diffuse variable sized air containing lungs cysts. (B) Male patient 29 years old known smoker with PLCH. HRCT axial image showing bilateral upper lobe bizarre shape air containing lung cysts.

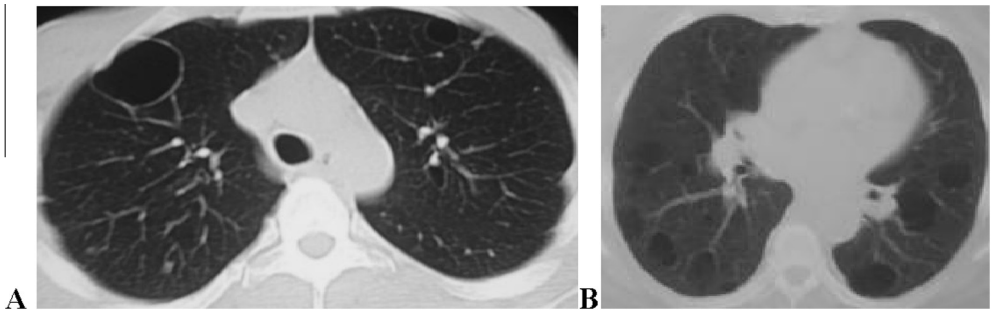

**Fig. 7.** Two cases with multiple bilateral air containing cysts. (A) Male patient 36 years old with infective endocarditis, CT chest lung window images showing multiple bilateral upper lobes post inflammatory cysts. (B) Female patient 65 years old with endometrial stromal sarcoma, CECT chest for staging revealed bilateral variable sized air-containing lung cysts; cystic metastases.

**Table 3**
Types of cases with mediastinal cysts prevalence and approach used to reach correct diagnosis.

| Mediastinal cystic lesion | No. of cases | % of cases | Clinical features | CT technique | Cyst distribution | Cyst characteristics | Other computed tomographic findings | Other investigations |
|---|---|---|---|---|---|---|---|---|
| Bronchogenic cyst | 2 | 40% | Dyspnea, dysphagia | CECT | Single Paratracheal, hilar, subcarinal regions | Smooth, well defined, oval or rounded, homogenous, fluid/ protein content | | Pathological evaluation |
| Pericardial cyst (Fig. 8) | 2 | 40% | Incidental | CECT | Single at cardiophrenic angle, right sided | Well defined, rounded or ovoid, fluid containing cyst | | Pathological evaluation |
| Malignant Cystic lymphoma | 1 | 20% | History of lymphoma treatment | CECT | Multiple at sites of lymph node groups | Variable shape lesions with internal fluid attenuation; necrotic contents | Associated other solid lymph nodes | Pathological evaluation |

CECT: Contrast Enhanced Computed Tomography.

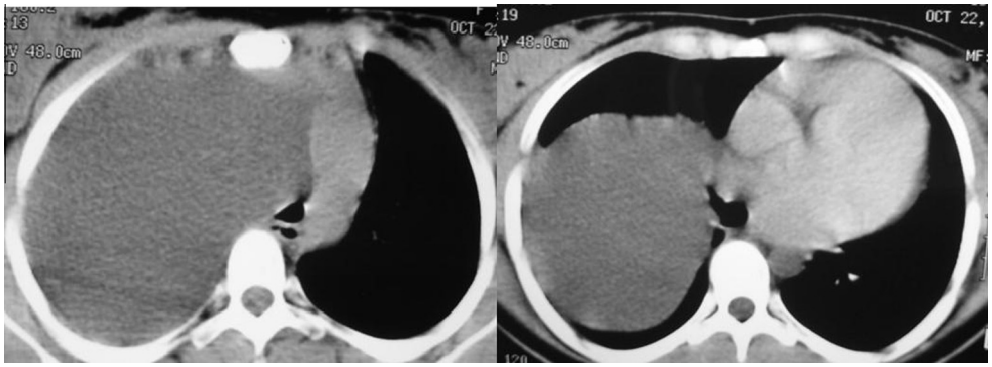

**Fig. 8.** Female patient 19 years old. NECT chest revealed a huge sized fluid-containing mediastinal cyst. Pathology revealed pericardial cyst.

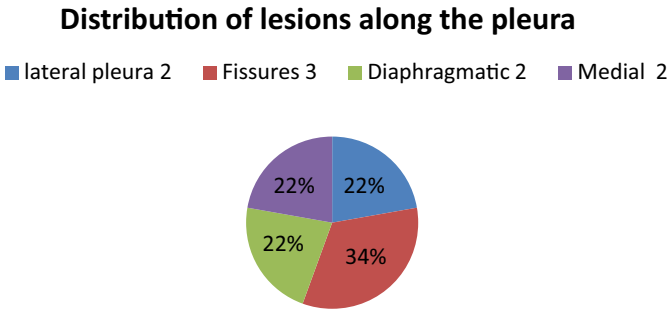


**Fig. 9.** The distribution of lesions along the pleura.

of the necrotic material inside, (2) infiltration of malignant cells into the walls of a preexisting benign pulmonary bulla, and (3) infiltration of malignant cells into the walls of air sacs formed by cystic distension of small airways through the ball-valve effect of the tumor [21].

Four of the current study's cysts were pleural in nature, two males and two females. Multiplanar CT chest proved that all cases were loculated effusion showing their relation to fissure or chest wall, and their pleural nature was clearly located. Arenas-Jiménez et al., 2000 showed that effusions were classified as free or loculated. An effusion was loculated when it showed septations, and it was compartmentalized or accumulated in a fissure or a non-dependent portion of the pleura, or when it showed a convex shape facing the lung parenchyma. CT is the modality of choice that can discriminate the pleural relation [22].

The current study reported four cases with chest wall cysts, and all were single and contained fluid. Two of four cases were hematoma, one was empyema necessitans and one was TB abscess.

Thoracic wall hematoma is well described in trauma patients and as a complication in patients receiving anticoagulants who undergo thoracic or shoulder surgery [3].

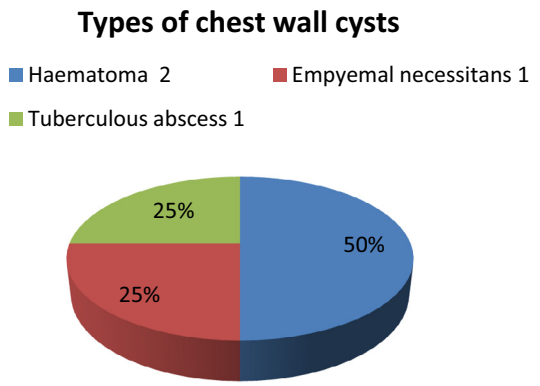


**Fig. 10.** Distribution of lesions along the chest wall.

Tuberculosis locations in the chest wall are not common; this location was seen less than 10% of skeletal tuberculosis. Even if thoracic vertebral locations are included, chest wall involvement remains rare [23]. In this study, cold abscess was diagnosed by CT and confirmed by bacteriologic diagnostic methods. Faure and colleagues reported tuberculous abscess of chest wall [23]. In their study, fifteen of eighteen cases had history of tuberculosis (83.3%), while Bekci et al., 2010 reported a case of chest wall cold abscess in a patient that had no TB history [24]. Cold abscess of chest wall is generally solitary lesions but multiple lesions are possible. Twelve of fourteen patients in Faure's study had a single mass. In our case, it was a single cystic lesion with positive history of tuberculosis.

Cystic lesions of the mediastinum are rare. Most of them are congenital lesions and account for 20–30% of all primary masses of the mediastinum [9]. In CT they appear well marginated and fluid-filled lesions. They include a variety of entities with overlapping radiologic manifestations and variable prognoses [5]. In our study we found five cases of mediastinal cysts and all were pathologically proven distributed as two (40%) bronchial cysts, two (40%) pericardial cysts and one (20%) cystic degeneration of malignant lymphoma. Takeda et al., 2003 retrospectively reviewed the records of 105 patients with cysts of the mediastinum; it is found that Foregut cysts, including bronchogenic and esophageal cysts, represented 48.6% of all cysts in the mediastinum. Bronchogenic cysts were more common than esophageal cysts. Mesothelial cysts, including pericardial and pleural cysts, accounted for 18.1% [25], which is less than estimated in our study.

This study reported a case of cystic degeneration of mediastinal lymphoma at the paraspinal gutter complex. Hopper et al., 1990 studied the thoracic CT scans of seventy-six patients who had newly diagnosed Hodgkin disease with mediastinal involvement with respect to the presence of necrosis (low attenuation, complex, fluid like areas). CT scans showed cystic changes in sixteen patients (21%). It was stated that rapid infiltration of the nodal medulla by neoplastic cells leads to obstruction of lymph flow, propagation of cancer cells to other nodal chains, and necrosis [26].

The recommended approach to reach proper diagnosis in chest cystic lesions from our research work could be summarized as follows: first determine the location of the cyst in the thorax. Second, in case of pulmonary cysts, relevant history taking, and radiographic features of cysts number, site, distribution, content, shape, and surrounding pulmonary parenchymal changes should be assessed. In case of pleural, mediastinal and chest wall cystic lesions, assessment of the site and shape of cysts is the main differentiating feature. Then diagnostic possibilities could be suggested. Lastly auxiliary approach, mainly histopathological assessment, could be done.

## 5. Conclusion

Cystic lesions of the thorax have a wide range of differential diagnosis, 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.

## Conflict of interest

The authors declare that they have no conflict of interest.

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