Computed Tomography guided transthoracic aspiration of a central bronchogenic cyst in an inoperable adult- A case study

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Abstract:
A bronchogenic cyst is a developmental anomaly which arises as a result of abnormal budding of the tracheobronchial tree during the course of its development. It usually presents during early life or rarely in adults. The presentation may be asymptomatic or with compressive symptoms like cough, dyspnoea or chest pain. The definitive treatment in symptomatic cases is surgical resection, although, in inoperable patients, a transthoracic aspiration with follow-up is an alternative measure. We present a 70-year old symptomatic female with cerebrovascular and ischaemic heart disease who was treated symptomatically by transthoracic aspiration because of inoperable co-morbidities and is presently asymptomatic under follow-up.

Key words: Bronchogenic cyst, transthoracic aspiration, co-morbidities

Introduction:
Bronchogenic cysts arise as a result of abnormal budding of the tracheobronchial tree during the course of its development between the 26th day and 16th week of intrauterine life, in which a tracheal or bronchial bud becomes detached from its parent, thereafter developing separately to produce a cystic structure. They may be classified according to their situation as either central( mediastinal) or peripheral(intraparenchymal or intralobar). Central bronchogenic cysts are believed to arise earlier in the developmental process, detaching themselves from major airways and occupying a para-tracheal position at the level of the carina or close to a main or lobar bronchus, or adjacent to the esophagus. If the anomaly occurs at a later stage, the cyst is situated peripherally. The cyst may vary in size, and may be single or multiple. The cyst wall is thin, and lined by ciliated respiratory epithelium. The presence of cartilage in the walls helps to distinguish them from cysts of different origins. If infected, the cyst walls may thicken, and the characteristic histological features may be destroyed. These cysts are frequently asymptomatic, and may be seen as an abnormal shadow on the chest radiograph requested for some unrelated reason. Symptoms usually occur due to pressure effect on adjacent structures or due to infection. Thus patients may present with dyspnoea, stridor or cough due to pressure on trachea or main bronchi, dysphagia due to compression on trachea, or arrhythmias due to compression on the heart.¹

The chest radiograph usually shows a well defined homogenous opacity in the mediastinum close to the major airways or in the lung periphery. If infected or when communicating with the airways, an air fluid level may be seen.

The treatment of these cysts is slightly controversial. Most of the authors suggest an elective surgical resection to make a definitive diagnosis and to prevent serious complications. Recent studies show that

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there is a role for aspiration in small asymptomatic cysts and in inoperable patients with co-morbidities.

**Case Report:**

A 70-year old lady presented to the outpatient department with complaints of dry cough of around 8 years duration. The cough was of insidious onset and was more on lying supine. She had minimal relief on taking medications, the symptoms being more in rainy season and winters. She also gives a history of Grade II dyspnoea. There was no history of haemoptysis, wheezing or chest pain. She had a history of a cerebrovascular accident five years back from which she had partially recovered and is now able to walk and take care of herself with minimal help.

On examination, she had pallor, breath sounds were decreased in the right anterior chest, there was a dull note on percussion and breath sounds were also decreased in this area. The neurological system examination revealed features of left hemiparesis with Grade IV+ power in both left upper and lower limbs. The systemic examination was otherwise normal. The chest radiograph showed a well defined, rounded opacity in the right paracardiac region extending from the right upper to middle zone (**Figure I**).

**Figure I: Chest X ray showing right paratracheal shadow**

The computed tomography (CT) images showed a well defined cystic mass adjacent to the trachea extending to the anterior wall on the right hemithorax (**Figure II**). A diagnostic CT-guided aspiration yielded clear fluid with negligible protein and sugar levels. Cytological and microbiological examination was also normal.

**Figure II: CT images showing the well defined cyst adjacent to the trachea extending to the anterior wall**

A detailed cardiac evaluation of the patient showed evidence of ischaemic heart disease with mild left ventricular dysfunction. Other investigations were normal.
As the patient had cardiac and cerebrovascular co-morbidities, it was decided to pursue a conservative line of management. A CT-guided transthoracic aspiration was conducted which yielded around 400 ml of similar fluid. The patient immediately became asymptomatic and it was decided to keep her under follow-up. She continues to be asymptomatic at 5 months of follow-up without recurrence of cough and the chest radiograph also showed no evidence of reaccumulation (Figure III).

**Figure III: Chest X-ray at 5 months follow-up**

**Discussion:**

Bronchogenic cysts are rare developmental anomalies which are seen more commonly in the mediastinal than pulmonary area, although in some series, intrapulmonary cysts were seen more commonly. Liu HS et al reported 50 patients out of which 28 were mediastinal, 12 pulmonary and the rest in other locations. All the patients were treated by surgical resection.2 Kanemitsu Y et al reported 17 cases out of which 11 were mediastinal and rest pulmonary. Fourteen were treated by surgical resection, 3 by Video Assisted Thoracic Surgery(VATS). Most of the other series also support complete excision in most instances to confirm the diagnosis, relieve symptoms, and prevent complications.3 Tsuyoshi Hasegawa et al reported a case of bronchogenic cyst recurring in a 42-year old male after 15 years of incomplete resection.4 After reviewing 310 papers with 683 patients, Kirmani B et al concluded that in asymptomatic patients, if they opt for conservative management, this can be offered if close long-term follow-up can be guaranteed.5 Li L et al described 4 cases in whom CT-guided transthoracic aspiration and bleomycin sclerotherapy was offered with the patients being followed up for recurrence. At a median follow-up of 10 months (range, 6-14 months), all three patients with symptoms had symptomatic relief and all four patients showed a near complete regression of bronchogenic cyst on follow-up CT. No recurrence was encountered.6 Other routes of aspiration include transbronchial or guided by EndoBronchial UltraSound(EBUS) where cases have been followed up to 18 months without recurrence. There have been reports of mediastinitis following this procedure7,8,9,10. Le Guen Y et al reported a 92-year old patient presenting with stridor who was treated with transthoracic aspiration. In this patient, she was completely relieved of her symptoms. The procedure was repeated after one year due to recurrence of symptoms. This study supports the potential use of CT-guided transthoracic needle aspiration as an alternative to surgical treatment in cases of inoperable symptomatic bronchogenic cyst.11 In our patient, taking into consideration the high per-operative risk, she was an ideal candidate for transthoracic aspiration because of the anterior location of the cyst. She has been asymptomatic for six months now. We support the view that aspiration of the cyst is a better alternative to surgery in elderly patients with co-morbidities. We postulate that surgical options may be considered if there is a strong diagnostic dilemma, or if they develop complications.
while under follow-up. In favorable locations like subcarinal or paratracheal, transbronchial (preferably by EBUS) may be a good option for small cysts which may difficult to reach by transthoracic route.

**Conclusion:**

CT-guided transthoracic aspiration is a suitable alternative to surgical resection in the treatment of symptomatic mediastinal bronchogenic cysts in inoperable patients with co-morbidities.

**References:**

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