聯合會員通訊
Volume 29, No. 4
Jan 2020

A lady with unresolved pneumonia

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Case

A 22 year-old human resource officer was admitted for the management of unresolved pneumonia. She enjoyed a good past health and recently travelled to Korea, Bali and Taiwan. She first presented with fever and right side pleuritic chest pain 4 months before attending our specialist out-patient clinic (SOPC). The Chest X-ray(CXR) **(Figure 1)** that time showed a right upper lobe consolidation. She was given a course of oral Augmentin with no radiological improvement. A plain computed tomography (CT) **(Figure 2)** of thorax was performed at that time. It showed right upper lobe anterior segment consolidation with a central hypodense area.

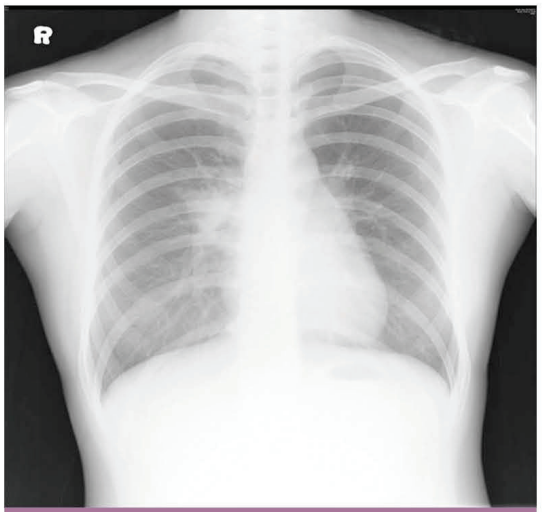

Figure 1

By the time of first SOPC attendance, this patient was almost asymptomatic. A contrast CT thorax scan **(Figure 3)** was repeated and it showed that the consolidated area enlarged. Baseline blood tests including C-reactive protein (CRP), procalcitonin and anti-HIV were normal and non-informative. Sputum for bacterial and acid fast bacilli culture were negative. Bronchoscopy examination was normal. In view of radiological deterioration, she was given 10 days of intravenous Augmentin before stepping down to oral Augmentin for another two weeks. A repeated Chest X-way confirmed radiological improvement.

Chest X-ray was repeated upon a follow-up clinic session and the right upper lobe consolidation deteriorated again. Fine needle aspiration of the right upper lobe lesion was performed under X-ray guidance. Histology only showed

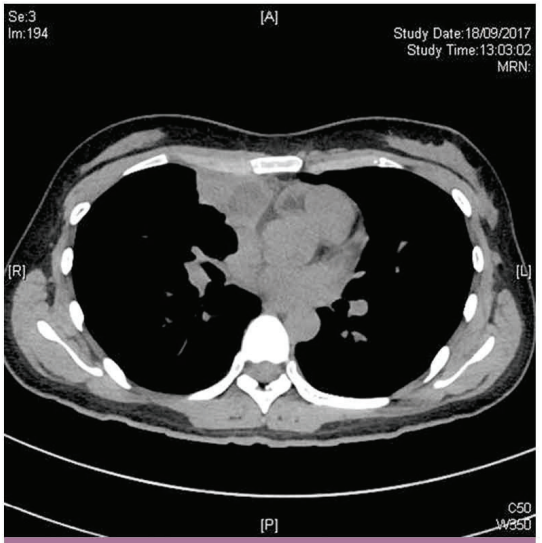

Figure 2

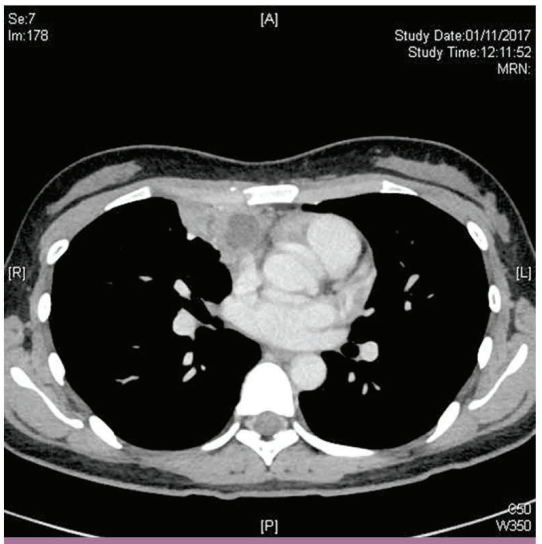

Figure 3

inflammatory exudates, which bacterial culture confirmed the presence of Acinetobacter baumannii. She was treated as a case of lung abscess with intravenous Tazocin. Radiological improvement was noted.

One month afterwards her chest X-way showed recurrence of right upper lobe consolidation again. FNAC was repeated under X-ray guidance. Again, Acinetobacter baumannii was found in the specimen. She was given another course of intravenous Maxipime and Amikacin. A repeated CT thorax showed worsening of right upper lobe consolidation, which the central hypodense area remained static in size.

A Video-Assisted Thoracic Surgery (VATS) was performed. During surgery, an anterior mediastinal mass arising from thymus was noted. The mass strongly adhered to the upper lobe of the lung. There was associated right upper lobe consolidation. Excision of the mediastinal mass and right upper lobe wedge resection were performed. Histological examination confirmed the presence of pancreatic acini, pilosebaceous units, interstinal mucosa and thymic tissue. The diagnosis was mature cystic teratoma. The specimen was also sent for bacterial culture and again, Acinetobacter baumannii was found.

Discussion

To the best of our knowledge, this was the first reported case of subclinical community-acquired Acinetobacter pneumonia in association with a mature cystic teratoma which mimicked a lung abscess.

There were three remarkable points in this case:

1. Simulation of the mature cystic teratoma to a chronic lung abscess.
2. Association between mature cystic teratoma and adjacent lung consolidation.
3. Subclinical community-acquired Acinetobacter pneumonia.

Mature cystic teratomas and associated lung consolidation

The diagnosis of mediastinal mass can be difficult, mainly due to diverse causes and clinical presentations. Notably, anterior mediastinal masses were more likely to be malignant. Primary mediastinal germ cell tumors (GCTs) were a heterogeneous group of benign and malignant neoplasms (teratomas, seminomas, and nonseminomatous germ cell tumors) originating from misplaced primitive germ cells in the mediastinum. It accounted for 10% to 15% of all mediastinal tumors in adults.

Mediastinal teratomas composed of tissues derived from two or all of the three primitive germ cell layers, and usually occur in young patients aged between 20 and 40 years, with a slight female predilection. Most of them were mature and benign, composed of well-differentiated tissues. In rare instances, teratomas were malignant, containing fetal tissues (immature teratomas) or a focus of carcinoma, sarcoma, or malignant germ cell tumors (malignant teratomas, teratocarcinomas, or mixed GCTs). Malignant transformation of mature teratomas, although extremely rare, may occur. Up to 59% of mediastinal teratomas were asymptomatic and were discovered incidentally. For the rest of the patients, symptoms may occur when there was adjacent organ compression, tumor rupture, and/or superimposed infection.

Spontaneous rupture of mediastinal teratomas had been reported to occur in about 40% of cases, especially in mature type. The most frequent sites of rupture were the lung and the tracheobronchial tree, followed by the pleural cavity, the pericardial cavity, the mediastinum, and the great vessels. The clinical symptoms and radiographic findings depended on the site of the rupture. These included chest pain (from secondary chemical pneumonitis, pleuritis, or mediastinitis), dyspnea, hemoptysis, hemothorax, trichoptysis (expectoration of cheesy or sebaceous materials and hair), pneumothorax, cardiac tamponade, and perforation of the involved great vessels.

There were five proposed mechanisms for tumor rupture:

1. Autolysis by digestive or proteolytic enzymes released from glandular-type tissues within the tumor (e.g. pancreatic tissues, salivary gland tissues, or intestinal epithelium),
2. Chemical inflammation caused by sebaceous gland secretions,
3. Ischemia secondary to rapid tumor growth,
4. Pressure necrosis, and
5. Superimposed infection.

In our case, we speculated that sebaceous materials and/or enzymes released from pancreatic tissues might have produced chronic inflammation and/or gradual erosion of the tracheobronchial tree, leading to subsequent rupture.

Surgical resection of the tumor remained the treatment of choice because of the risks of rupture, development of serious and life-threatening complications, malignant transformation, and poor response to both chemotherapy and radiation therapy.

Community acquired acinetobacter baumannii pneumonia

Acinetobacter baumannii was notoriously recognized as an important cause of hospital acquired pneumonia. It was also an uncommon cause of community acquired pneumonia (CAP). Community acquired Acinetobacter pneumonia was a clinically unique entity which was characterized by a fulminant course with a high incidence of bacteremia, ARDS, septic shock, DIC, and early death. The mortality rate is higher than the overall mortality rate (40 to 64% versus 24%) of other severe CAP. Of noted, the usual empirical antimicrobial regimens for CAP did not cover this organism. Risk factors included hazardous alcohol use, smoking, chronic lung disease, and chronic renal disease.

We thought that Acinetobacter pneumonia did occur in our patient as the organism was isolated from culture three times (two lung aspirate and one surgical specimen). Moreover, radiological improvement was once observed after antibiotic treatment. The pathology of the resected lung also showed acute on chronic inflammation. Our case was unique in that the disease was subclinical (relatively asymptomatic, normal CRP and procalcitonin all along), in contrast to the classical description of fulminant pneumonia.

In conclusion, we reported a case of unresolved Acinetobacter baumannii pneumonia due to underlying mature cystic teratoma (mimicking a lung abscess). We suggested that for atypical presentations of pneumonia and/or lung abscess, an alternative diagnosis should be considered.

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This Masquerade

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Patient Mr. X was a 65-yo gentleman who had underlying hypertension, diabetes and hyperlipidemia. He was a chronic smoker for more than 30 pack-years.

He was admitted for hemoptysis and there was 8-month history of chronic cough. On admission he had fever and required 4L oxygen supplement.

White cell count (WCC) was elevated to 20x10*9/L. CXR showed right middle lobe (RML) consolidation **(Figure 1A & 1B)**.

Figure 1A

Figure 1B

Intravenous Augmentin was started. Sputum culture yielded Methicillin-sensitive Staphylococcus aureus. Fever and hemoptysis subsided after two days. CXR showed partial resolution of RML consolidation. WCC down to 13x10*9/L and C reactive protein was normalized.

Mr. X had private CT thorax done 2 weeks after discharge which showed irregular patchy area of lung air space density in right middle and lower lobes. Diffuse tree-in-bud-density in right lower lobe **(Figure 2-4)**. There was no endobronchial lesion. Findings were suggestive of infective changes.

Further investigations including sputum AFB, TB-PCR were all negative. Bronchoscopy was arranged in view of persistent symptoms (cough, on and off hemoptysis). There was incidental finding of irregular mucosal growth over distal left main bronchus **(Figure 5)**. Bronchial aspirate for bacterial culture, AFB, TB-PCR were negative. Bronchial brush and biopsy did not show any malignant cell.

In view of suspicious lesion over left main bronchus with a negative bronchial biopsy, repeated biopsy with cryoprobe was arranged to obtain a larger specimen. After reviewing the biopsy slides with pathologist, it came to a conclusion of pulmonary Actinomycosis as the cryobiopsy showed granulation tissue with ossified material and Gram positive filamentous bacteria.

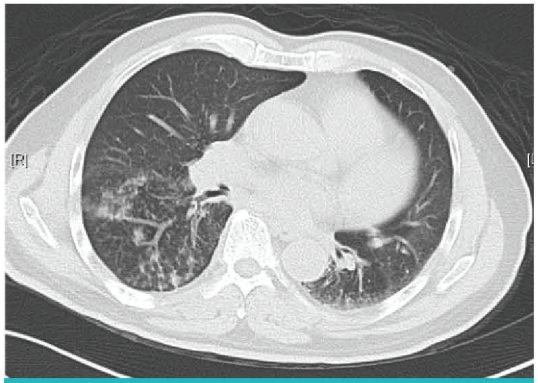

Figure 2

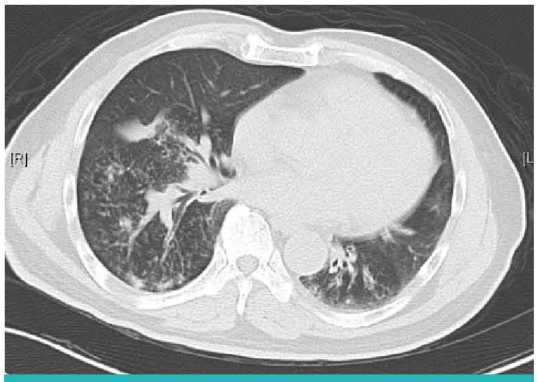

Figure 3

Figure 4

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Intravenous penicillin was given for two weeks and then switched to oral Augmentin. Dental assessment did not show any active dental caries.

After 2-weeks of IV penicillin, bronchoscopy was repeated and there was partial resolution of the endobronchial growth. Bronchial biopsy was repeated and again showed ossified material with bacterial colonies. The bronchial aspirate showed negative culture for Actinomyces. In view of repeated biopsy showing ossified material and known association of foreign body aspiration with pulmonary Actinomycosis, we arranged CT review with radiologist and found that there is a calcified lesion over distal left main bronchus **(Figure 6A-6D)**.

After a multidisciplinary meeting, cardiothoracic surgeon arranged rigid bronchoscopy for Mr. X and an irregular object of 1.5x1cm was removed from the left main bronchus **(Figure 7)**. The pathology report turned out to be a necrotic bone tissue comprising anastomosing bone trabeculae with numerous colonizing bacteria and degenerative suppurative infiltrates **(Figure 8)**.

Relook bronchoscopy after prolonged course of Augmentin showed resolution of mucosal swelling. Follow up CT thorax showed only mild residual bronchiectatic changes over left lower lobe.

Mr. X remained asymptomatic afterwards. He could not recall any choking episode. Assessment by speech therapist revealed normal swallowing for Mr. X.

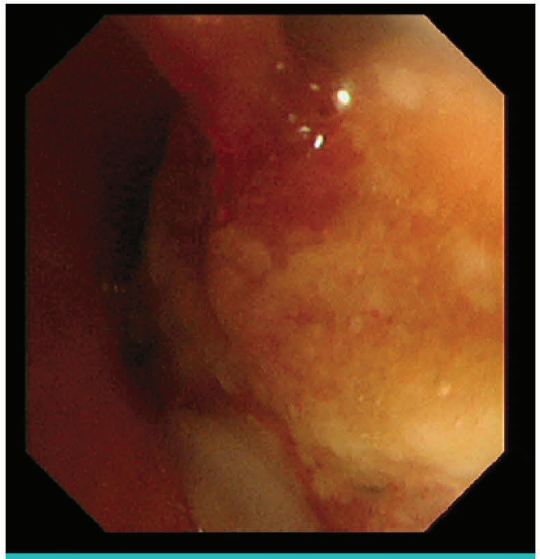

Figure 5

Figure 6A

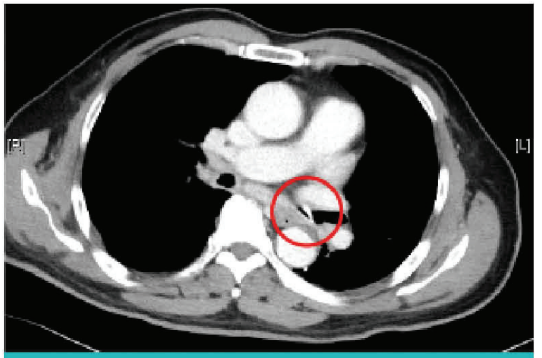

Figure 6B

Figure 6C

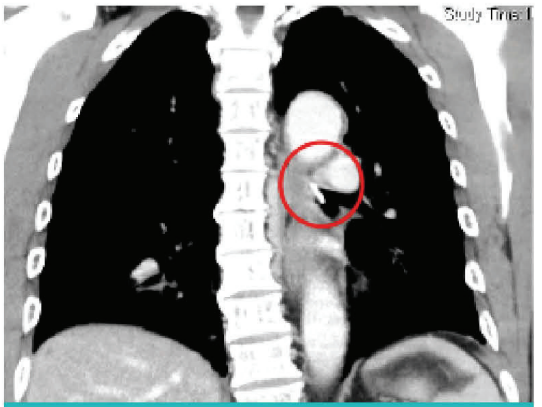

Figure 6D

Discussion

Foeign Body Aspiration

Foreign body aspiration is not uncommon and the estimated mortality is around 1.2/100,000 [1]. The first case of foreign body retrieval from the airway was reported in 1897 by Gustav Lillian.

Risk factors for foreign body aspiration including extreme of age and all disease affecting patients' swallowing like poor dentition or neurological diseases. Acute cases could present with dyspnea, stridor or cardiac arrest while chronic cases could have more wide range in symptoms like chronic cough, hemoptysis, "asthma" micmic or even silent.

There are wide range of foreign bodies documents in literature including bones, teeth, metallic objects, etc. which varies with age and different cultures [2, 3].

To diagnose a case of foreign body aspiration, we need to have a high index of suspicion especially in elderly or chronic cases which the patient may not be able to recall a choking event.

For imaging, CXR has limited diagnostic value as the sensitivity is only around 28-60% while the specificity is around 68%. CT scan, as compared with CXR could able to pick up non-radiopaque objects also and the actual sensitivity depends on the relative thickness of the cut of CT machine as compared with the size of foreign body [2, 4].

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Figure 7

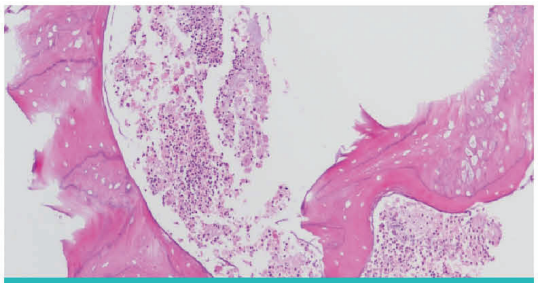

Figure 8

Bronchoscopy is the gold standard in diagnosing foreign body aspiration as it provided direct visualization of the foreign body. However, it is uncommon to have granulation tissues surrounding the foreign body in chronic case, which might mimic endobronchial malignancy. Rigid bronchoscopy is a debatable optimal tool for extraction. It can secure the airway and provide larger working channel for suctioning and haemostasis. It is safe and effective. However general anesthesia is needed and distal airway could not be visualized [5, 6]. Flexible bronchoscopy is increasing used as first line treatment in selected case as the successful rate in removal is up to 61-100%. And as compared with rigid bronchoscopy, flexible bronchoscopy is more readily available and can reach the more distal airway [3, 7].

Other than the conventional forceps or baskets, cryoprobe could be used for foreign body extraction. The advantage of using the cryoadhesion is that it is independent of the shape of the foreign body is even body with slippery surface. However, it is dependent on the cryoadhesivesness of the object, which is related to the water content. In addition to direct removal of the foreign body, cryoprobe could be used to remove the surrounding granulation tissue, which was not uncommon in cases foreign body aspiration [7, 8]. Besides to use for foreign body removal, cryoprobe could be used in obtaining bronchial biopsy. As compared with conventional forceps biopsy, the specimen of cryobiopsy is significantly larger (10.4 vs 5.2 mm). There is also less crush artifacts. As a result, the overall diagnostic yield is higher by cryobiopsy but with comparable rate of severe bleeding [9, 10].

Tumour mimics and Pulmonary actinomycosis related to foreign body

There is a long list of tumour mimics. Benign lesions included papilloma, adenoma, hamartoma etc and infection eg TB, actinomyces. While malignant diseases like lymphoma, melanoma, sarcoma etc are not uncommon, not to mention the metastatic tumours from the breast, kidney and colorectal region [11, 12].

Actinomycosis is a chronic, granulomatous, suppurative infection due to a group of Actinomyces, gram-positive anaerobic organisms belonging to the resident flora of the oropharynx, gastrointestinal tract, and woman genitalia. 20% of actinomycosis occurs in the thorax [13, 14].

Risk factors for developing pulmonary actinomycosis included debilitating state, poor oropharyngeal hygiene, alcoholism or any chronic lung disorders with damaged lung tissue, forming an anaerobic milieu that favors the growth of actinomycete. Patients could present with cough, sputum, chest pain or unresolved pneumonia [13, 15].

Radiological features including consolidation, atelectasis, ground glass opacity, cavitation, localized bronchiectasis and pleural effusion. Mediastinal or hilar lymph node enlargement is not uncommon [13, 14, 15].

Endobronchial actinomycosis is a subtype of pulmonary actinomycosis and there is granular thickening and partial occlusion of bronchi, for severe cases, there could be an exophytic mass [16, 17].

To diagnose pulmonary actinomycosis, we mainly rely on the histology as Actionomyces species are strict anaerobe and the culture are frequently overgrowth by non-anaerobic contaminants. The characteristic features of actionomycosis is the presence of characteristic sulphur granules [16, 18].

For cases of endobronchial actionomycosis associated with foreign body aspiration, the foreign body could only able to be detected some time after starting antibiotics in up to 55% cases. Therefore, second look bronchoscopy is always necessary to avoid missing any foreign body [19].

The prognosis is good for pulmonary actinomycosis as antibiotics treatment is generally curative. The only independent factor associated with poor outcome is the absence of antibiotics response at 1 month. The antibiotics regimen usually consist of an initial phase with intravenous penicillin at a dose of 18–24 million units daily for 2–6 weeks, followed by oral penicillin or amoxicillin for 6–12months. Shorter treatment duration could be considered in selected cases especially those associated with foreign body aspiration [20].

Conclusion

Foreign body aspiration could masquerade as lung malignancy. Bronchoscopy should be repeated to rule out foreign body aspiration in endobronchial actinomycosis. Rigid bronchoscopy is gold standard for foreign body retrieval but flexible bronchoscopy could be used in selected cases.

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