Recurrent pseudomonal pneumonia in a young immunocompetent adult – something fishy?

Saravu K[1], Naha K[1], Mukhopadhyay C[2], Balasubramanian R[3]

1. Department of Medicine, Kasturba Hospital, Manipal 576104, Karnataka, India
2. Department of Microbiology, Kasturba Hospital, Manipal 576104, Karnataka, India
3. Department of Medicine, Indira Gandhi Medical College and Research Institute, Puducherry 605009, India

CASE REPORT

Please cite this paper as: Saravu K, Naha K, Mukhopadhyay C, Balasubramanian R. Recurrent pseudomonal pneumonia in a young immunocompetent adult – something fishy? AMJ 2011, 4, 5, 263-265
http://doi.org/10.21767/AMJ.2011.713

Corresponding Author:
Dr Kushal Naha
Department of Medicine,
Kasturba Hospital,
Manipal 576104,
Karnataka, India
kushalnaha@gmail.com

Abstract

Community-acquired pneumonia due to *Pseudomonas aeruginosa* typically occurs in patients with pre-existing lung disease and immunocompromised individuals. We report the case of a previously healthy young adult who presented with recurrent episodes of pneumonia due to *Pseudomonas aeruginosa* complicated by pleural effusion. Careful and extensive evaluation ultimately revealed the unusual reason behind the patient's illness.

Key Words
recurrent community-acquired pneumonia, *Pseudomonas aeruginosa*, immunocompetent

Background

Pseudomonas aeruginosa is an uncommon cause for community acquired pneumonia.[1] When encountered, it is seen predominantly among immunocompromised patients, and patients with chronic lung disease. Non-resolving and recurrent pneumonias are again most often seen in the presence of immunodeficiency or structural disease of the lungs. An important step in the management of patients presenting with recurrent pneumonia in the absence of such risk factors is a careful search for an endobronchial lesion that might perpetuate infection despite adequate antimicrobial therapy.

Case details

A 23-year-old man presented with acute onset right-sided chest pain, dry cough and fever of one day duration. The chest pain was sharp and stabbing in nature and aggravated on coughing. He denied any symptoms suggestive of immunodeficiency in the past. Clinical examination revealed decreased chest movements on the right side, dullness to percussion over the right lung base and diminished breath sounds in the same area. Routine laboratory tests were normal except for neutrophilic leucocytosis (TLC: 13.6 x 10^3/cu.mm, 83% neutrophils).

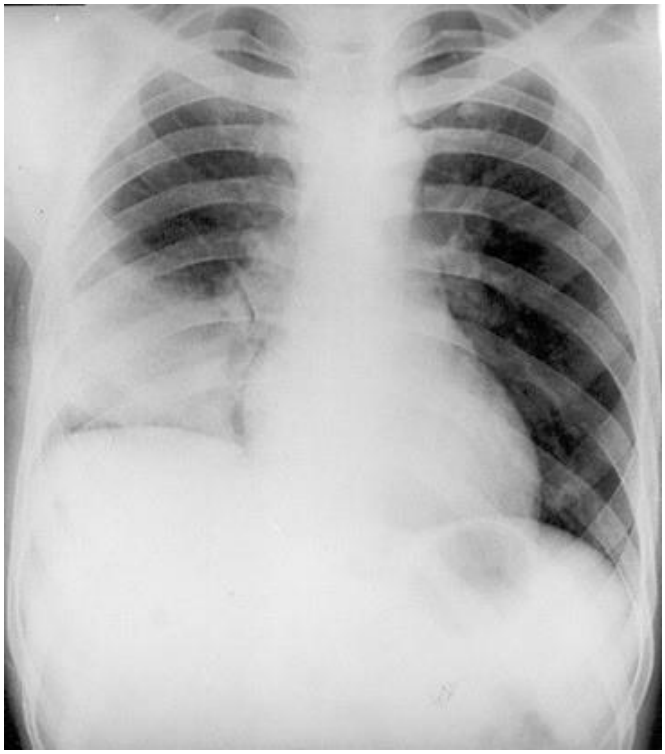

Figure 1: Chest X ray done at admission showing right lower zone consolidation with costophrenic angle blunting

A chest radiogram showed right lower zone consolidation and blunting of the right costophrenic angle (Figure 1). An ultrasound of the thorax confirmed the presence of minimal effusion, which could not be tapped even under ultrasound guidance. Sputum culture grew a moderate growth of *Klebsiella pneumonia* and *Pseudomonas aeruginosa*. A diagnosis of right lower lobe pneumonia with syn-pneumonic effusion was made. He was treated with oral levofloxacin and parenteral tobramycin according to the sensitivity of the isolates. The patient was also tested for HIV infection after appropriate counselling, and was found to be negative. Ten days after starting therapy, the patient reported significant subjective improvement, and a repeat radiogram showed resolution of the consolidation, but a persisting pleural effusion. He was then discharged with advice to continue antibiotics for a further five days.

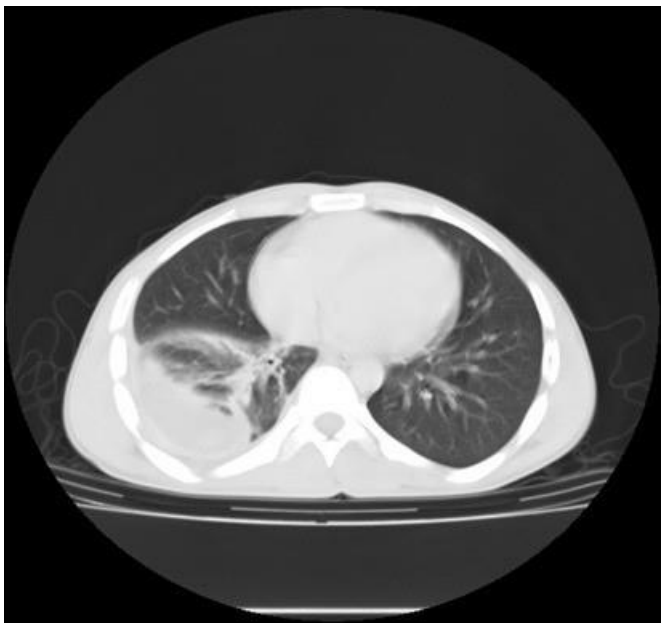

Figure 2: CT thorax showed an enhancing soft tissue density

Within four days of discharge, however, the patient's symptoms had relapsed and he was readmitted. A chest radiogram showed a reappearance of the right lower zone consolidation as well as the persistent pleural effusion. An ultrasound guided thoracentesis was performed which yielded 20ml of thick purulent material. Analysis of the aspirate was suggestive of an empyema (pH 7, TLC: 76,400/cu.mm, 73% neutrophils). He was empirically started on parenteral therapy with broad-spectrum antibiotics. Gram-staining of sputum smears showed the presence of gram-negative bacilli and plenty of pus cells; sputum culture grew *Pseudomonas aeruginosa* once more. As the patient continued to be febrile and serial radiograms showed no significant improvement, an intercostal drainage tube was inserted and the antibiotic was changed to ceftazidime according to the sensitivity pattern of the isolate. At this point, the patient began to bring out copious amounts of blood-tinged purulent sputum. The possibility of an underlying obstructive endobronchial lesion was now considered and the patient underwent flexible bronchoscopy, which showed a whitish lesion in the right lower lobe bronchus. Keeping in mind the patient's unresolving symptoms, this was presumed to be a bronchial adenoma. CT imaging of the thorax showed an enhancing soft tissue density mass encasing the basal segmental bronchus of the right lower lobe, with atelectasis of the surrounding parenchyma and a persisting loculated empyema (Figure 2). In an effort to get a tissue diagnosis, a rigid bronchoscopy was performed. It revealed the presence of a foreign body within the previously visualised mass. The object was extracted successfully and found to be a fish bone (Figure 3). The patient was questioned carefully but denied any history of choking or aspiration prior to the onset of his symptoms. He was continued on parenteral antibiotics. Thereafter, the patient made a rapid recovery and was discharged. He remained symptom-free on follow up and repeat chest radiograms showed full resolution of the lower zone shadow.

Figure 3: Fish bone recovered from the right lower lobe by rigid bronchoscopy. Minimal granulation tissue is seen partially encasing the bone

Patient consent

Signed informed consent was given by the patient for publication of material pertaining to this case.

Discussion

Although common in the paediatric age group, foreign body aspiration is unusual in adults.[2] The presence of neurologic deficit, a history of alcoholism and episodes of loss of consciousness of various aetiologies are the principal risk factors for foreign body aspiration in adults. However, our patient possessed none of these risk factors. Foreign body aspiration in adults also differs from paediatric cases in that they are more often non-asphyxiating; this is because of the larger calibre of adult airways. In lieu of main stem bronchus occlusion, such foreign bodies can migrate distally, most often to the right lower lobe bronchus because of its nearly vertical disposition and larger size. [3,4]

Occult foreign body aspiration can manifest in a variety of ways including unexplained cough, wheeze and dyspnoea. Foreign bodies can also remain undetected for years, producing such delayed complications as obstructive emphysema, bronchiectasis[2], bronchial stenosis, bronchopleural and even bronchocutaneous fistulae, pneumothorax and pneumomediastinum.[5,6] Local

bronchiectatic changes induced by the presence of the foreign body, in association with impaired mucus clearance, promote colonisation of the airways by micro-organisms.[5] *Pseudomonas aeruginosa* is known to colonise airways in patients with cystic fibrosis and bronchiectasis. We propose a similar mechanism to explain the isolation of *Pseudomonas* from our patient. Inflammation resulting from virulence factors elaborated by *Pseudomonas* further exacerbates bronchiectasis, resulting in a vicious cycle[7] which manifests clinically as recurrent pneumonia.

Flexible bronchoscopy is the gold standard test for aspirated foreign bodies,[8] while rigid bronchoscopy is the mainstay of therapy[6] which consists of the immediate removal of the foreign body.[5] Chest radiograms are of limited utility[9] since they can identify only radiopaque objects. CT thorax has been suggested as an alternative tool in patients with non-diagnostic bronchoscopy.[10] This feature of foreign body aspiration is important because radiograms still constitute the principal modality of imaging used to screen patients with pneumonia for complications. Furthermore, patients often trivialise and forget episodes of choking that may have occurred long before the development of complications.[11] In conclusion, occult foreign body aspiration should always be considered in otherwise inexplicable recurrent pneumonia. A high index of suspicion is therefore required[4] to diagnose this condition in order to avoid the potential morbidity associated with delayed diagnosis.

References

1. Arancibia F, Bauer TT, Ewig S, Mensa J, Gonzalez J, Niederman MS, Torres A. Community-acquired pneumonia due to gram-negative bacteria and Pseudomonas aeruginosa: incidence, risk, and prognosis. Arch Intern Med. 2002; 162: 1849-58.
2. Chen CH, Lai CL, Tsai TT, Lee YC, Perng RP. Foreign body aspiration into the lower airway in Chinese adults. Chest 1997; 112: 129-33.
3. Mise K, Jurcev-Savicevic A, Pavlov N, Jankovic S. Removal of tracheobronchial foreign bodies in adults using flexible bronchoscopy: experience 1995–2006. Surg Endosc. 2009; 23: 1360-4.
4. Limper AH, Prakash VBS. Tracheobronchial foreign bodies in adults. Ann Intern Med. 1990; 112: 604-9.
5. Ben-Dov I, Aelony Y. Foreign body aspiration in the adult: an occult cause of chronic pulmonary symptoms. Postgrad Med J. 1989; 65: 299-301.
6. Wolkove N, Kreisman H, Cohen C, Frank H. Occult foreign body aspiration in adults. JAMA 1982; 248: 1350-2.
7. Cole PJ. A new look at the pathogenesis, management of persistent bronchial sepsis: A 'vicious circle' hypothesis and its logical therapeutic connotations. In: Davies RJ. Strategies for the Management of Chronic Bacterial Sepsis. Oxford: Medicine Publishing Foundation. 1984:1-20.
8. Rafanan AL, Mehta AC. Adult airway foreign body removal. What's new? Clin Chest Med. 2001; 22: 319-30.
9. Al-Majed SA, Ashonr M, Al'Mobeireek AF, Al-Hajjaj MS, Alzeer AH, Al-Kattan K. Overlooked inhaled foreign bodies: late sequelae and the likelihood of recovery. Respir Med. 1997;91:291-3.
10. Malis DJ, Hayes Maj DK. Retained bronchial foreign body: is there a role for high-resolution computed tomography scan? Otolaryngol Head Neck Surg. 1995; 112: 341-6.
11. Whitlock WL, Brown CR, Young MB. Tracheobronchial foreign bodies. Ann Int Med. 1990;113:482-3.

ACKNOWLEDGEMENTS

Written consent for publication was obtained from the patient.

PEER REVIEW

Not commissioned. Externally peer reviewed.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

FUNDING

None.

CONSENT

The authors declare that

1. They have obtained informed consent for the publication of the details relating to the patient in this report.
2. All possible steps have been taken to safeguard the identity of the patient.
3. This submission is compliant with the requirements of local research ethics committees.