CASE FOUR

Short case number: 3_7_4
Category: Respiratory System
Discipline: Medicine
Setting: General Practice
Topic: Bronchiectasis [SDL]

Case

Amanda Wong, aged 67 years, presents complaining of a chronic cough. She advises that it is worse every morning when she coughs up foul smelling 'mucus'. She is worried because the amount is increasing. She has had a single course of antibiotics and it got a little better but two weeks later she is coughing up as much as ever. Yesterday she saw some blood in her 'mucus' and is very worried.

Questions

1. What further history & examination would you undertake?
2. What investigations would you order?
3. What are the presenting symptoms of bronchiectasis?
4. What are the common causes of bronchiectasis?
5. Assuming you diagnose bronchiectasis, how would you manage this case?

Suggested reading:

Innes JA, Reid PT. Respiratory disease. In: Boon NA et aal. Davidson's Principles and Practice of Medicine 20th Ed. Churchill Livingstone, London, 2006 PP647-737.

ANSWERS

1. What further history & examination would you undertake?

The history must include an assessment of the duration of symptoms, including the appearance of and volume of sputum, and associated respiratory symptoms of chest pain and shortness of breath.
Systemic symptoms such as fever, malaise, nausea, vomiting, weight loss and anorexia should be sought.
Check past medical history including intercurrent illness, past history of smoking, past medical illnesses, travel and occupational history.

Physical examination includes vital signs and pulse oximetry. It needs to include an assessment of nutritional status. Examine for fever, cachexia, and peripheral cyanosis.
Clubbing may be present if chronic. Ask to view a sputum sample. .
Examination of the chest should reveal coarse crackles all over affected lobe.

2. What investigations would you order?

- Sputum examination (microscopy, examination, sensitivity)

In addition to common respiratory pathogens, sputum culture may reveal *Pseudomonas aeruginosa*, fungi such as *Aspergillus* and various *Mycobacteria*.
Frequent cultures are necessary to ensure appropriate treatment of resistant organisms.

- Radiology

Bronchiectasis, unless very gross, is not usually apparent on a chest x-ray.
In advanced disease, thickened airway walls, cystic bronchiectatic spaces, and associated areas of pneumonic consolidation or collapse may be visible.
CT is much more sensitive to show thickened dilated airways

- Assessment of ciliary function

A screening test can be performed in patients suspected of having a ciliary dysfunction syndrome by assessing the time taken for a small pellet of saccharin placed in the anterior chamber of the nose to reach the pharynx, when the patient can taste it. This time should not exceed 20 minutes and is greatly prolonged in patients with ciliary dysfunction. Ciliary beat frequency may also be assessed using biopsies taken from the nose. Structural abnormalities of cilia can be detected by electron microscopy.

3. What are the presenting symptoms of bronchiectasis?

-Symptoms due to accumulation of pus in dilated bronchi
Chronic productive cough usually worse in mornings and often brought on by changes of posture.
Sputum often copious and persistently purulent in advanced disease.
Halitosis is a common accompanying feature
-Symptoms due to inflammatory changes in lung and pleura surrounding dilated bronchi Fever
Malaise
Increased cough and sputum volume when spread of infection causes pneumonia, which may be associated with pleurisy.
Recurrent pleurisy in the same site often occurs in bronchiectasis
-Haemoptysis
Can be slight or massive and is often recurrent.
Usually associated with purulent sputum or an increase in sputum purulence.

-Systemic symptoms
When disease is extensive and sputum persistently purulent a decline in general health occurs with weight loss, anorexia, lassitude, low-grade fever, and failure to thrive in children.
In these patients digital clubbing is common

4. What are the common causes of bronchiectasis?

Congenital - Cystic fibrosis - Ciliary dysfunction syndromes - Primary ciliary dyskinesia (immotile cilia syndrome) - Kartagener's syndrome (sinusitis and transposition of the viscera) - Primary hypogammaglobulinaemia
Acquired (children) - Pneumonia (complicating whooping cough or measles) - Primary TB - Inhaled foreign body
Acquired (adults) - Suppurative pneumonia - Pulmonary TB - Allergic bronchopulmonary aspergillosis complicating asthma - Bronchial tumours

5. Assuming you diagnose bronchiectasis, how would you manage this case?

- Physiotherapy

Patients should be instructed how to perform regular daily physiotherapy to keep the dilated bronchi empty of secretions. When this is performed correctly, it is high effective to reduce the cough and amount of sputum produced. This may help to prevent recurrent episodes of bronchopulmonary infection.
Patients should adopt a position in which the lobe to be drained is uppermost.
Deep breathing followed by forced expiratory manoeuvres is of help in allowing secretions in the dilated bronchi to gravitate towards the trachea, from which they can be cleared by vigorous coughing.
'Percussion' of the chest wall with cupped hands may help to dislodge sputum, and a number of mechanical devices are available which cause the chest wall to oscillate, thus achieving the same effect.
This all needs to be undertaken for 5-10 minutes once or twice daily at a minimum for most patients.

- Antibiotics

This may be difficult due to organisms such as staphylococci and Gram-negative bacilli, in particular *Pseudomonas* species. In these circumstances antibiotic therapy should be guided by the microbiological results but frequently requires the use of oral ciprofloxacin (250-750 mg 12-hourly) or ceftazidime by intravenous injection or infusion (1-2 g 8-hourly).

- Surgery

Very few people are suitable for surgery. These are most often young people in whom the bronchiectasis is unilateral and confined to a single lobe or segment as demonstrated by CT. There are high rates of problems as there is often co-incidental areas of damaged lungs acting as reservoirs of infection.