Case report

Haemoptysis with subtle computed tomography signs

A 70-year-old woman was referred to the respiratory department with a 6-month history of dry cough and intermittent minor haemoptysis. This was associated with a sensation of chest discomfort and some shortness of breath on moderate exertion with no orthopnoea or paroxysmal nocturnal dyspnoea. She had a background of coronary artery disease treated by stenting two years previously. She also had a hiatus hernia, type 2 diabetes and cervical spondylosis.

She had had no significant childhood lung diseases and there was no family history of any respiratory disease. She had stopped smoking 17 years previously but had smoked 20 cigarettes day$^{-1}$ for 40 years. She had no nasal or laryngeal symptoms and did not have any symptoms of gastro-oesophageal reflux or aspiration.

Examination was normal with no stridor, wheeze or crackles. Spirometry was normal with a forced expiratory volume in one second (FEV$_1$) of 2.2 L (99% predicted), and vital capacity (VC) of 2.67 litres with FEV$_1$/VC ratio of 0.82. A chest radiograph (figure 1) appeared normal. A computed tomography scan was performed (figure 2).

Task 1
Describe the computed tomography appearances on the image at the level of the trachea (figure 2) and what the next appropriate investigation to perform would be?
Haemoptysis with subtle computed tomography signs

Biopsy confirmed nodules of cartilage with focal ossification (figure 5). Sirius and Congo red stains for amyloid were negative.

Discussion

Tracheobronchopathia osteochondroplastica is a benign condition characterised by abnormal outgrowths of cartilaginous tissue into the lumen of the trachea, central bronchi and larynx [1]. The nodules may undergo ossification with calcification giving rise to nodules and flecks of calcification visible on computed tomography imaging [2]. The bronchoscopic appearances are often dramatic with hard nodules of tissue in the submucosa of the trachea and central airways, variously described as “cobblestone nodules” or “stalactite grotto” appearances. Typically, the nodules affect the anterior and lateral walls, but spare the posterior membranous portion of the trachea. The differential diagnosis includes calcified amyloidosis, endobronchial sarcoidosis, calcified tuberculosis, papillomatosis and tracheobronchial calcinosus.

The aetiology and pathogenesis are unknown but the nodules seem to arise from the cartilage of the airways, thus sparing the posterior tracheal membrane. Immunohistochemical studies have detected bone morphogenetic protein 2 and transforming growth factor beta 1 in the nodules, but provoking factors are not understood [3]. The usual age at diagnosis is about 65 years, but cases have been described in children and in families with a mother and daughter affected [4]. Laryngeal involvement may occur, resulting in hoarseness and stridor. Often tracheobronchopathia osteochondroplastica is a co-incidental finding.
at bronchoscopy or at autopsy. It usually follows a benign course over many years and doesn’t necessarily cause symptoms. Cough, sputum, haemoptysis and sometimes chest discomfort may occur. Lung function tests are usually normal. Occasionally the nodules are sufficiently widespread as to cause obstruction on spirometry or flow–volume loops. If the nodules occlude a lobar bronchus then distal infection may occur. Treatment is often not needed. Bronchoscopic removal of obstructing lesions or stenting of the trachea has rarely been performed [5].

Affiliations

Anas Al Fahad1, Sylvia Worthy2, Stephen J. Bourke1
1Respiratory Medicine Dept, Royal Victoria Infirmary, Newcastle upon Tyne, UK. 2Radiology Dept, Royal Victoria Infirmary, Newcastle upon Tyne, UK.

Conflict of interest

None declared.

References

1. Leske V, Lazor R, Coetmeur D, et al. Tracheobronchopathia osteochondroplastica: a study of 41 patients. Medicine 2001; 80: 378–390
2. Restrepo S, Pandit M, Villani M, et al. Tracheobronchopathia osteochondroplastica: helical CT findings in 4 cases. J Thoracic Imaging 2004; 19: 112–116
3. Tajima K, Yamakawa M, Katagiri T, et al. Immunohistochemical detection of bone morphogenetic protein-2 and transforming growth factor beta-1 in tracheopathia osteochondroplastica. Virchow Arch 1997; 431: 359–363.
4. Prakash U. Tracheopathia osteoplastica: familial occurrence. Mayo Clin Proc 1989; 64: 1091–1096.
5. Khan AM, Shim C, Simmons N, et al. Tracheobronchopathia osteochondroplastica: a rare cause of tracheal stenosis. J Thorac Cardiovasc Surg 2006; 132: 714–716.