CLINICAL REPORTS

Tracheal obstruction presenting as asthma

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Summary

A case is reported in which a tracheal tumour presented with symptoms suggestive of bronchial asthma. In the assessment and management of airways obstruction and wheeze, it is important to bear in mind that disease other than asthma and chronic bronchitis may present in this way.

KEY WORDS: trachea, carcinoma, asthma.

Case report

A 34-year-old housewife presented with a 3-month history of cough and sputum. She reported exertional wheeze but no nocturnal breathlessness. She had frequent chest infections as a child. She was a life-long non-smoker and there was no family history of asthma. Physical examination showed her to be overweight with large smooth goitre. There were scattered wheezes in the lung fields but no other abnormality was detected. Spirometry: forced expiratory volume in one sec. (FEV_1) = 2.20 litre (predicted 2.60); forced vital capacity (FVC) = 2.98 litre (predicted 2.96); peak expiratory flow rate, (PEFR) = 160 litre per min (predicted 403). After inhaled salbutamol, 200 μ g, FEV_1 improved by 10%. She had positive skin prick tests to multiple common allergens. Chest X-ray was normal. A diagnosis of asthma was made and inhaled β_2 sympathomimetics were recommended.

During the next few months she required courses of corticosteroids for exacerbations of her wheeze—producing improvement in symptoms on each occasion. Eight months later, FEV_1 was 1.2 litre, FVC 2.65 litre, PEFR 85 litre/min. Flow volume loops showed an expiratory plateau suggestive of fixed large airways obstruction for which the goitre was thought to be responsible. At this time, she

developed haemoptysis which was of short duration and which settled without therapy.

She was admitted as an emergency a few weeks later having had a severe attack of dyspnoea at home. On arrival she was stuporose and cyanosed with a respiratory arrest shortly after arrival in hospital. She was intubated and artificially ventilated with full intravenous therapy for acute severe asthma.

Artificial ventilation was complicated by the very high inflation pressures required (70–90 cmH₂O) and high inspired oxygen concentrations needed to maintain a satisfactory PaO_2 . Auscultation of the chest now revealed no wheeze. This was thought to reflect severity of bronchospasm rather than its absence.

No improvement had resulted after 24 hr of this treatment regimen and fiberoptic bronchoscopy with the intention of performing bronchial lavage for removal of inspissated secretions was carried out.

The lower trachea was found to be almost completely obstructed by a vascular, polypoid tumour arising from the posterolateral wall of the trachea. Neither bronchoscope nor biopsy forceps would pass the obstruction. Biopsies showed adenoid cystic carcinoma of trachea.

Emergency right lateral thoracotomy was performed, revealing a 3.5 cm long tumour, with its lower extent 1.5 cm above the tracheal bifurcation. Tumour involved the muscular coat of the oesophagus. No lymphadenopathy was identified. Resection of visible tumour, with end-to-end anastomosis of the trachea, was performed.

Discussion

Primary tumours of the trachea are very uncommon but not rare. As has been noted (Karlan, Livingstone and Baker, 1973), the inclusion of tracheal tumours in the differential diagnosis of

adult-onset dyspnoea and wheeze is even more uncommon than the tumours themselves. Most authors reporting this condition have remarked on the delay in accurate diagnosis. Tracheal tumours frequently present with symptoms suggestive of asthma or chronic bronchitis and the patients are usually initially managed accordingly. The symptoms may be insidious in onset and the tumour may occlude three-quarters of the lumen before symptoms are reported. The single most common symptom is wheeze, but cough, dyspnoea and haemoptysis are frequent. Pain, weight loss and malaise are unusual (Cleveland, Nice and Ziskind, 1977). This patient's maximal flow-volume loop showed an expiratory plateau indicating reduced peak expiratory flow. The inspiratory portion of the loop was unremarkable, but since inspiratory dynamic compression of the extra-thoracic airways should be expected, inspiratory resistance would be greater than expiratory resistance when upper airways obstruction is present.

When upper airways obstruction is present, a large reduction of expiratory flow occurs at high lung volumes only so that the FEV_1 is almost normal. There is thus a disparity between PEF and FEV_1 values, and the ratio FEV_1/PEF is therefore often increased. The inappropriate PEF value for the FEV_1 value may serve to alert the physician to the possibility of upper airways obstruction. The routine PA chest radiograph is classically normal.

If the 'asthmatic' patient's progress is less than satisfactory, the physician should consider obstructing lesions of the major airways. This should involve

more probing investigations including high-penetration chest radiography, tracheal tomography and examination of flow-volume loops. Endoscopy is definitive.

Adenoid cystic carcinoma probably accounts for up to one-third of malignant tracheal tumours (Houston *et al.*, 1969). It tends to occur more commonly in females and has not demonstrated association with cigarette smoking. It has a striking tendency to local spread, probably because of poor encapsulation. Distant metastases are a late event.

Where possible, the treatment of choice is surgical but recurrence is frequent. Chemotherapy alone has not been useful (Eby, Johnson and Baker, 1972), but good response after cobalt-60 therapy has been described (Richardson, Grover and Trinkle, 1973).

Delay in diagnosis remains the principal problem.

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