CASE REPORT

Aerodigestive Amyloidosis Presenting as Acute Asthma

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Summary

Aerodigestive amyloidosis is a rare disorder characterized by fibrillar protein deposition in the aerodigestive tree. We present a case of a 19-year-old Chinese gentleman whose diagnosis was initially missed as he presented with features suggestive of severe bronchial asthma and was intubated and ventilated. He subsequently presented 2 years later with severe stridor and required emergency tracheostomy. Current literature is reviewed for the histopathology, common clinical features, radiological findings and treatment options for aerodigestive amyloidosis.

Key Words: Aerodigestive amyloidosis, Tracheal stenosis, Bronchial asthma

Case History

In February of 2000, a 19-year-old Chinese male presented to the ENT department of Seremban Hospital with complaints of progressive difficulty in breathing and tightness in chest of 5 days duration. The patient also gave a history of recent upper respiratory tract infection. The patient apparently was intubated and ventilated 2 years ago for severe bronchial asthma. The patient had no prior history of bronchial asthma and had subsequently been well without treatment. There was no history of chronic cough, progressive hoarseness or dysphagia. There was no history of tuberculosis, syphilis or any other chronic medical illness.

On examination, there was mild stridor, visible dyspnea and tachypnea. The patient was however able to speak in full sentences and auscultation of the lungs revealed clear lung fields with no rhonchi. His throat was mildly congested. The patient was admitted and started on intravenous antibiotics, dexamethasone and oxygen via high flow mask.

The patient's condition rapidly worsened in the next 4 hours. He had increasing stridor and difficulty in breathing and became restless. Blood gas analysis showed carbon dioxide retention. He was transferred to the ICU where he was intubated. During intubation some difficulty was encountered as there was some obstruction distal to the cords and only a size 6 endotracheal tube was inserted. At this point a provisional diagnosis of subglottic stenosis was made.

Two days later the patient had tracheostomy and rigid bronchoscopy performed under general

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anaesthesia. Granulation tissue was noted on the posterior wall of the trachea well below the vocal cords. A biopsy was taken for histopathological examination. The patient was subsequently well and asymptomatic on tracheostomy.

Histopathology examination of the granulation tissue revealed large amounts of amorphous, eosinophilic material showing apple green birefringence with Congo red staining when observed with polarizing microscope. Hence the diagnosis of amyloidosis was concluded.

The patient was subsequently referred to the Medical Department to investigate the cause of the amyloidosis. ESR, VDRL, CRP, Liver Function Test, LE cells, Full Blood Picture and urine and serum paraprotiens were all within normal parameters. Thus, in their opinion the amyloidosis was localised in nature.

On subsequent follow up the patient was asymptomatic. Further examination revealed a mass in the left postnasal space which was biopsied. Examination of the trachea revealed granulation tissue extending up to the carina and was biopsied again. The histopathology was consistent with amyloidosis from both samples. Currently, the patient is still on tracheostomy despite repeated laser resection of the subglottic portion of the lesion.

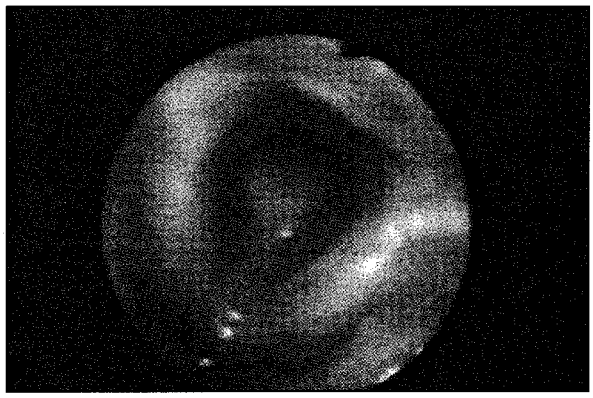

Fig. 1: Picture of patients tarynt

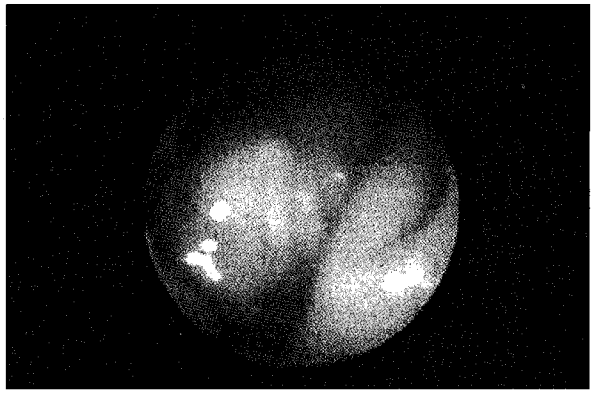

Fig. 2: Picture of patient's right nasophanynt

Discussion

Amyloidosis is a group of disorders manifested by impaired organ function from infiltration of tissues with insoluble protein fibrils or proteins complexed with polysaccharides. Clinically amyloidosis can be subdivided into systemic and localized forms. Systemic forms are due to B-cell dyscrasias, reactive amyloidosis (secondary to chronic inflammatory states e.g. rheumatoid arthritis, bronchiectasis, and dermatomyositis), hemodialysis related and hereditary forms. Localized forms are usually confined to a single organ or tissue and are classified as nodular deposits, endocrine amyloid and amyloid of aging. In the case of nodular deposits there usually is associated plasma cell infiltrates and it may represent localized forms of B-cell dyscrasias. It occurs most frequently in the lung, larynx, skin, bladder, tongue and periorbital region.

In aerodigestive amyloidosis (AA), amyloid was shown to be nodularly or diffusely deposited in the lamina propia of the aerodigestive tree. Amyloid fibril formation in AA appears to be related to light chains secreted by local plasma cells, combined with amyloid P, calcium and other factors.

This patient presented with tracheal stenosis secondary to primary localized amyloidosis of the trachea. He also had amyloid deposits in the nasopharynx, which is very rare. Tracheal stenosis is an insidious disease. It usually presents with symptoms of shortness of breath, wheezing, stridor, chronic cough and recurrent pneumonia. It can easily be mistaken for chronic bronchitis or bronchial asthma as happened in this patient. A high index of suspicion is required. Detailed past medical and surgical history is important. A previous history of intubation or tracheostomy is important, as tracheal trauma is a leading cause of tracheal stenosis. In the absence of such history the differential diagnosis is subdivided into congenital, neoplastic, infectious and inflammatory.
The common presenting symptoms appear to be dyspnea, cough, hemoptysis and hoarseness [1]. Some may even present with asthmatiform dyspnea hence delaying the final diagnosis as in this case. Most cases do not have any evidence of systemic involvement despite extensive work-up. Radiographic assessment includes plain chest radiographs and simple tracheal radiographs with filtered anterior posterior view and lateral soft tissue view. Occasionally tracheal fluoroscopy may be considered as it can pick out areas of tracheomalacia, which may coexist with tracheal stenosis. Generally MRI is considered to be superior to CT scan because it is possible to assess the length and width of the disease with sagittal and coronal views. However in the case of tracheal amyloidosis, CT scan is advantageous as it provides quantitative measurement of airway narrowing and mural thickening - two major features of tracheal amyloidosis. These features together with mural calcification sparing the posterior tracheal membrane have been reported in few disorders other than AA. The presence of such marked thickening of the entire tracheobronchial tree down to the segmental bronchi may be associated with post-obstructive collapse [2]. High resolution CT scan may show reticular opacities, interlobular septal thickening and small, well defined nodules of 2-4 mm in diameter predominantly in the subpleural region. The ability of CT scan to map out airway involvement and image extraluminal manifestations of amyloidosis make it the investigation of choice for this condition. The definitive procedure is rigid bronchoscopy, which can be diagnostic and therapeutic. It allows visualization of the length and width of the stricture and adequate biopsies may be taken.

The treatment of AA has so far been temporizing bronchoscopic methods like Nd: YAG laser resection, dilatation, debridement and stenting. The definitive treatment may well be external - beam radiation therapy [3]. This therapy has been seen to produce sustained improvements in symptoms, effort tolerance, bronchoscopic appearance and forced expiratory volume in 1 second with a dose of 20 Gy. In the Boston University Experience, from 1984 to 1999, 10

patients with biopsy proven AA were followed up for approximately 8 years[4]. It was found that those with severe mid airway and proximal airway disease did poorly with most of them dead by 7 to 12 years despite repeated bronchoscopic laser debridement. Those with moderate mid airway and all distal airway disease had either stagnant disease or slowly progressive narrowing. In this subset of patients Pulmonary Function Test was found to be more useful for monitoring disease progression because CT scan did not show much change in airway diameter after frequent bronchoscopic dilatation despite significant improvement in airflow. Survival may be lengthened and quality of life made acceptable by treating potential complications only via repeated laser recanalization in some patients [5].

In conclusion, this patient has amyloidosis involving his upper airways. This presentation of localized amyloidosis is very uncommon. AA is a diagnosis that needs to be considered when faced with patients who presents with features suggesting chronic bronchitis or bronchial asthma whom do not possess much clinical signs and chest radiograph findings to support these diagnoses and fail to respond to conventional therapy. Much needs to be done to evaluate radiation therapy and its long-term outcome as a treatment of choice for AA.

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