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CASE REPORT

Right Sided Aortic Arch Resembling Asthma

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Abstract

Exertional dyspnoea and shortness of breath at rest are common complaints in asthmatic patients. However, symptoms sometimes do not resolve under optimal medical treatment. In such cases infrequent causes of dyspnoea may be the underlying basis. We present a 38-year-old patient who suffered from shortness of breath not amenable to medical treatment for asthma for five years. In her medical history, the patient was on salbutamol inhalation as well as budesonide/formoterol inhalation for 5 years and the symptoms did not ameliorate. We diagnosed a right sided aortic arch after investigations. In this rare anomaly, both trachea and oesophagus might be encircled and compressed by large vessels as well as the aortic arch. Although some signs of right sided aortic arch can be recognized in chest radiograph and spirometry, accurate diagnosis is made by contrast enhanced computed tomography or angiography. Delay in diagnosis of right sided aortic arch may result in unnecessary investigations and prolonged periods of ineffective treatment. Diagnosis of right sided aortic arch leads to improvement in symptoms and withdrawal of unnecessary treatment.

KEYWORDS: Right sided aortic arch, asthma, dyspnoea, shortness of breath, spirometry

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INTRODUCTION

Shortness of breath, particularly during exercise, is a common complaint in everyday practice of physicians. Although treatment of most of the patients might be considered as straightforward, some cases remain challenging and symptoms of the patient continue. In such cases, infrequent causes of dyspnoea may be researched. We present a patient who suffered from shortness of breath not amenable to medical treatment for asthma for five years and diagnosed with right sided aortic arch.

CASE PRESENTATION

A 38-year-old female was admitted to our clinic suffering from cough and shortness of breath during both exercise and cough. She was on salbutamol inhalation as well as budesonide/formoterol inhalation for 5 years and the symptoms did not ameliorate. Chest radiograph did not reveal any information except indistinct shadow of aortic knob at the left side of the mediastinum (Figure 1). Spirometry revealed a peak expiratory flow of 55% of predicted. Expiratory flow volume loop was flattened so we proceeded to carry out a contrast enhanced computed tomography of thorax in order to investigate a large airway obstruction (Figure 2). Contrast enhanced computed tomography (CT) disclosed a right sided aortic arch and Kommerell's diverticulum, both of them were compressing the trachea (Figure 3,4). The patient was referred to cardiovascular surgery and an informed consent was obtained.

DISCUSSION

Treatment of asthma is frequently undemanding, although symptoms of some patients persist under optimal medical treatment. After excluding inappropriate inhaler devices, poor adherence to treatment, or persistent provoking factors, other causes of exertional dyspnoea should be researched in these patients and diagnostic tests should be assessed meticulously [1,2].

Several pathologies can result in compression to trachea and right sided aortic arch is one of them [3]. Both trachea and oesophagus might be encircled and compressed by large vessels as well as the aortic arch. In the chest radiography, absence of the shadow of the arcus aorta on the left side of the mediastinum might indicate a right sided aortic arch [2]. However, the sensitivity and the specificity of chest radiograph for right sided aortic arch are not well established [1].

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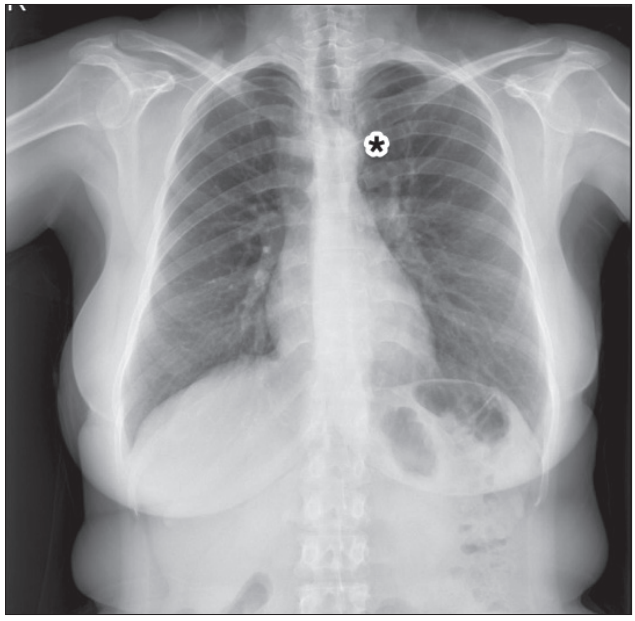

Figure 1. Chest radiograph, asterisk shows the indistinct shadow of the aortic knob.

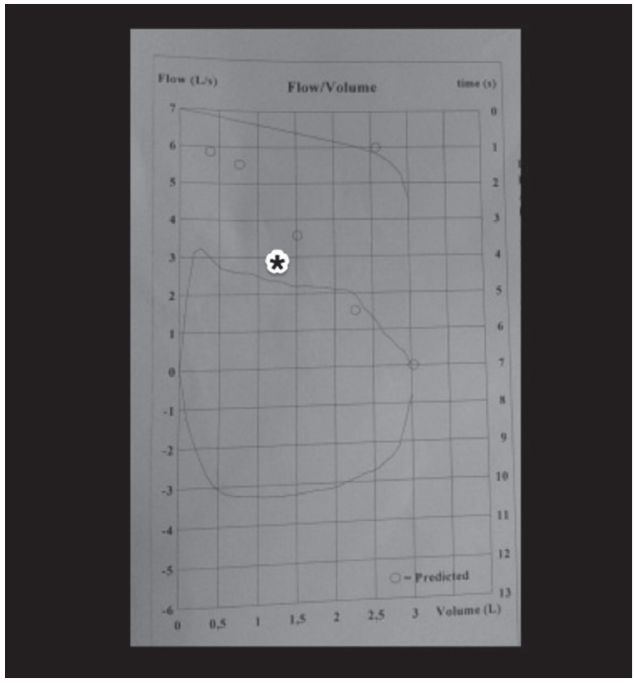

Figure 2. Spirometry flow volume loop of the patient, asterisk shows the flattened expiratory flow volume loop.

Not only measured parameters but also flow volume loop should be analysed in spirometry results. An extrinsic tracheal compression may be suspected from flattened expiratory flow volume loop in the spirometry [1,2]. Thoracic CT and magnetic resonance imaging (MRI) are the best methods to diagnose right sided aortic arch [2]. An unrecognized right sided aortic arch may result in unnecessary investigations and prolonged periods of ineffective treatment [1]. Diagnosis of right sided aortic arch without delay leads to improvement in symptoms and withdrawal of unnecessary treatment [1].

If the compression of the trachea and oesophagus is severe, the symptoms are likely to occur in infancy and early childhood [4,5]. Otherwise, symptoms such as cough, dysphagia, exertional dyspnoea, and chest pain usually appear in adulthood [4,5]. In the presented case, dyspnoea with cough might be due to tracheal compression by large vessels during forced expiration [4,5]. Similar symptoms may manifest in most asthmatic patients in relation to airway hyperreactvity [4,5].

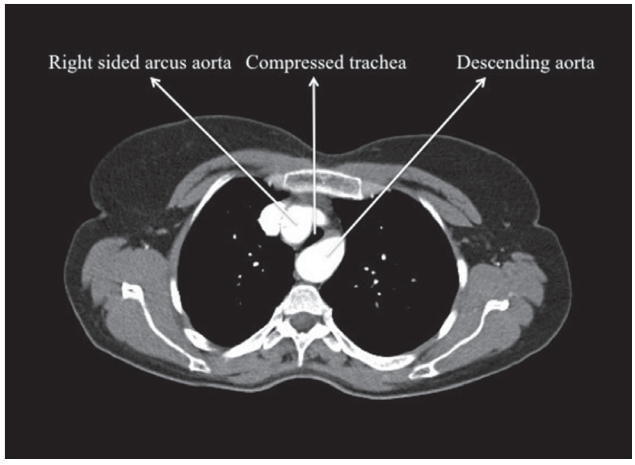

Figure 3. Computed tomography of the thorax, compressed tracheal lumen is shown.

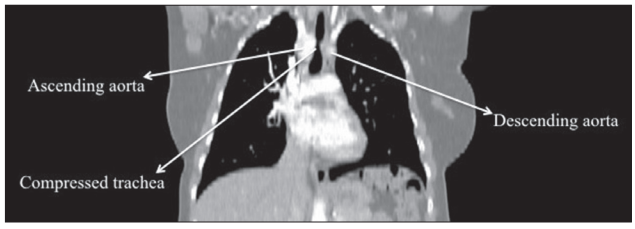

Figure 4. Reformatted image in coronal plane, compression on the tracheal lumen can be seen.

In conclusion, right sided aortic arch might be considered in differential diagnosis of asthmatic patients with persisting symptoms in order to avoid unnecessary treatment and prolonged airway compression. Flattening of spirometry flow volume curve might play a role in the diagnosis of this rare anomaly.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

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