

## A 12 year old boy with recurrent episodes of pneumonia: triple A syndrome

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### ABSTRACT

Triple A syndrome (Allgrove syndrome) is a rare inherited autosomal recessive disease with a typical triad including adrenocorticotrophic-hormone-resistant glucocorticoid insufficiency, reduced or absent tearing (alacrimea) and achalasia and a wide range of symptoms can be detected due to multi organ involvement. This report describes the case of a Triple A syndrome, a 12 year-old boy with a history of recurrent episodes of pneumonia and growth retardation due to failure to timely diagnosis of his problem.

**Keywords:** Allgrove syndrome, AAA-gene, Achalasia, Alacrimea, Adrenal insufficiency.

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### Introduction

Triple A syndrome is a very rare inherited autosomal recessive disease with a typical triad including adrenal insufficiency, reduced or absent tearing (alacrimea) and achalasia (1). Patients suffer from a wide range of clinical manifestations due to multi organ involvement (2-4). Prominent manifestations can vary in different cases e.g. , ophthalmic features reported by Brian P Brooks et al. (5), and neurological abnormalities which were well described by Etemadyfar M and Khodabandehlou R (6).

Some cases of patients with Triple A syndrome have been reported in Iran (6-10) Because of the rarity and life-threatening complication of this syndrome we describe the case of a 12 year-old

Iranian boy with Triple A delay in diagnosis and led to severe complications.

### Case Presentation

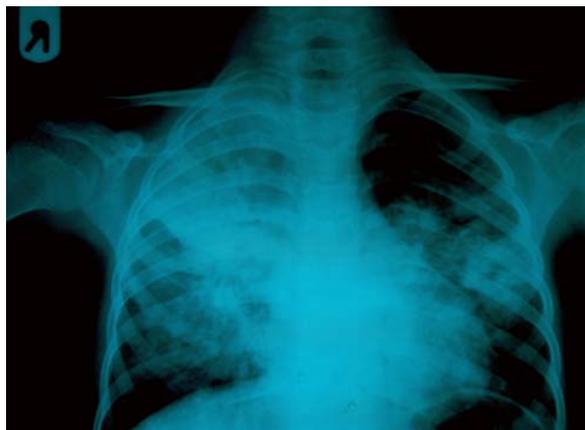
The patient is a 12-year-old boy admitted at internal medicine wards of our hospital for evaluation of recurrent episodes of pneumonia. He had a history of several admissions at other hospitals and recurrent episodes of aspiration pneumonia were documented for him (Figures 1 and 2). His parents were cousins and he has one healthy sibling. He was born by natural vaginal delivery after a full-term pregnancy and his birth weight was 2750 g. He was not able to produce tears since his infancy. Since he was 4-year-old, he had a history of halitosis and vomiting contained retained food materials. It was noticed that he had difficulty swallowing. He subsequently developed recurrent episodes of pneumonia

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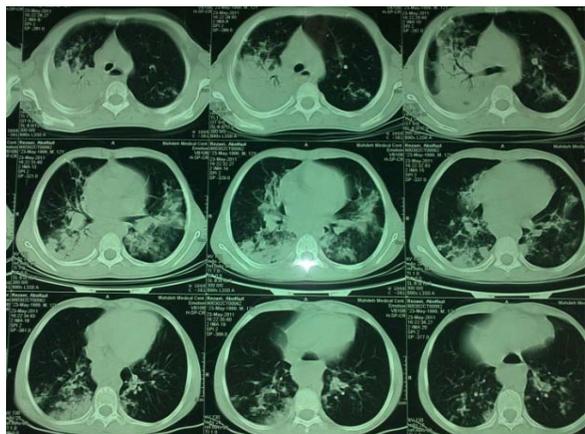
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episodes started and he had some evidence of growth retardation.



**Figure 1.** Bilateral alveolar pattern in lung fields

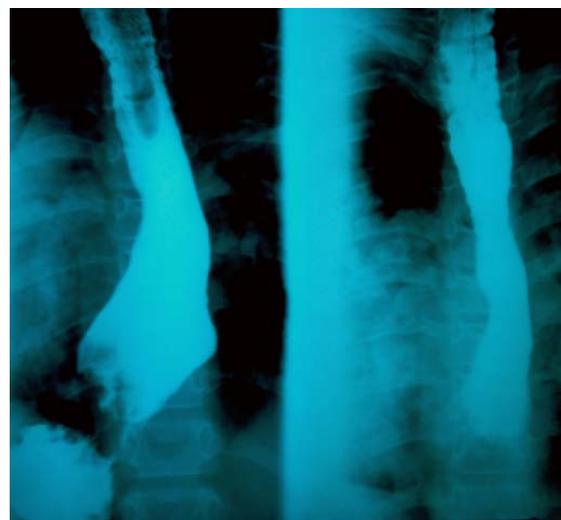


**Figure 2.** Chest CT scan showed bilateral infiltration with air bronchogram

At the age of eight, a barium swallow test was performed for evaluation of dysphagia. It showed dilated esophagus with distal narrowing that was typical for achalasia (Figure 3). Following his diagnosis of achalasia underwent esophagocardiomyotomy surgery. He was symptom free for about two years, but later dysphagia started again and he experienced some episodes of pneumonia.

He was referred to us and admitted for further evaluations at the age of 12 years. His weight was 34 kg and his height was 104 cm on admission. His Blood pressure was 80/60 on his left arm and 85/60 mmHg in on his right arm.

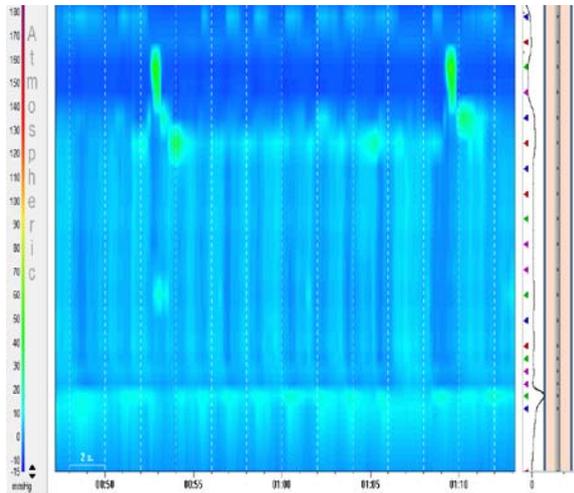
We performed an esophageal Esophagogastroduodenoscopy (EGD), a barium swallow study and a high resolution esophageal manometry for evaluating the esophagus. EGD showed a dilated esophagus with lots of retained food and scope was passed with force via lower esophageal sphincter (LES). Barium swallow showed a dilated esophagus with distal narrowing and barium stasis (Figure 4). High resolution manometry showed normal LES resting pressure (23 mmHg) with incomplete relaxation (23%), prolonged IRP (integrated relaxation pressure) (18 mmHg) and raised intrabolus pressure in free drinking maneuver (figure 4). These studies displayed ineffective response to previous treatment for achalasia in our patient.



**Figure 3.** First barium swallow at the age of 8 showed dilated esophagus with distal narrowing.

He was noticed to have slight nail plate pigmentation. Therefore we evaluate the pituitary-adrenal axis function. At 8 AM, his baseline serum cortisol was 6  $\mu\text{g/dl}$  (NL: 10-20 ( $\mu\text{g/dl}$ )) and baseline serum ACTH level (8 A.M.) was 126  $\text{pg/ml}$  (NL:10-60  $\text{pg/ml}$ ). ACTH stimulation test using 250 micrograms cortrosyn was performed for him. Cortisol level one hour later was measured. It was low (12  $\mu\text{g/dl}$ ) (NI $\geq$ 18  $\mu\text{g/dl}$  or elevation more

than 7-10 µg/dl to base line cortisol. So, adrenal insufficiency was established for him. Interestingly, except short stature, light hyper pigmentation in bed nails and easy fatigability, there was no other clinical indicator of adrenal insufficiency in this patient such as hypoglycemic shock, hypotension or seizure.



**Figure 4.** Manometrical study (HRM) four years after previous ineffective myotomy.

Definitive diagnosis of alacrima established with Schirmer's test. The result was positive and wetting was 3 mm in right eye and 2.5 mm in left eye during 5 minutes (NL > 5 mm wetting in 5 minutes).

According to achalasia, alacrima, and adrenal insufficiency, diagnosis of triple A syndrome was recognized for him and he received proper treatment for adrenal insufficiency. Also he went through cardiomyotomy and fundoplication for esophageal achalasia.

## Discussion

The most important clue for diagnosis of Triple A syndrome, is clinical suspicion of Allgrove (Triple A) syndrome should be considered in any child with achalasia. Delay in diagnosis and treatment of this syndrome can lead to severe

problems while proper and early intervention can prevent these undesirable consequences.

In our case because of the low socioeconomic status of the family, despite the early onset of symptoms in his early childhood, this patient was only brought to hospital when he was 8 years old. Delays in diagnosis led to severe complications.

Unfortunately the first esophageal myotomy was performed for him without any manometric assessment, and it led to ineffective response to treatment and worsening of his condition. In spite of the recurrent episodes of aspiration pneumonia after the surgery, reevaluation was only performed after a significant delay. It is advisable to consider Allgrove syndrome in all children with possible achalasia and to perform a manometric study before esophago-cardiomyotomy.

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