



## Spontaneous Chylothorax (A Case Report)

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### Abstract

Chylothorax is caused by the disruption or obstruction of the thoracic duct or its tributaries that result in leakage of chyle into the pleural space. A 3.5-year-old male patient without significant past medical history was admitted to the outpatient clinic of our hospital with persistent coughing. The initial chest radiograph demonstrated consolidation and effusion in the left lung upon which we performed thoracentesis. The pleural fluid had milk-white color. The biochemical analysis showed that its density was 1015 with pH: 7, glucose: 168 mg/dl, triglyceride: 2101 mg/dl, and WBC: 590/mm<sup>3</sup>. We started the treatment by offering a low-fat diet and somatostatin 3 µgr/kg/h. The chest tube was removed on the 25th day after the cessation of chylous pleural fluid from the tube in addition to the improvement that was visible on the chest radiograph; the patient was discharged. We would like to emphasize that chylothorax may occur very rarely but spontaneously and the use of somatostatin therapy may reduce the need for surgical intervention.

**Key Words:** Spontaneous Chylothorax; Somatostatin; Chest Tube.

### Spontan Şilotoraks (Bir Olgu Sunumu)

### Özet

Şilotoraks, duktus torasikus ya da dallarının bozulması ya da tıkanıklığına bağlı olarak plevral aralığa şilöz sıvının sızmasıdır. Öncesinde herhangi bir yakınması bulunmayan 3,5 yaşında erkek hasta, öksürük ve hırıltılı solunum şikayetleriyle başvurdu. Akciğer grafisinde sol akciğerde konsolidasyon ile birlikte plevral efüzyon saptandı. Kapalı sualtı drenaja alınan hastanın efüzyon sıvısının görünümü süt beyaz renkte, pH 7, dansite 1015, trigliserit 2101 mg/dl, glikoz 168 mg/dl, lökosit 590 mm<sup>3</sup> bulundu. Plevral efüzyon sıvısı kültüründe üreme olmadı. Bu bulgularla hastaya şilotoraks tanısı konuldu. Yağdan fakir diyetle birlikte somatostatin 3 µgr/kg/saat başlandı. Somatostatin tedavisine 2 hafta devam edilen hasta 25. günde toraks tüpü çıkarılarak taburcu edildi. Şilotoraksın çok nadiren de olsa spontan gerçekleşebileceği, tedavide somatostatin kullanımının cerrahi müdahale ihtiyacını azaltabileceği vurgulandı.

**Anahtar Kelimeler:** Spontan Şilotoraks; Somatostatin; Göğüs Tüpü.

## INTRODUCTION

Chylothorax is defined as the accumulation of lymphatic fluid in the pleural cavity due to damaged ductus thoracicus. It is one of the rare causes of pleural effusion in childhood. It is also often seen as a complication in children who undergo cardio-thoracic surgery though it may also rarely follow blunt chest trauma or sudden hyperextension of the spine (1, 2).

This study presents the case of a 3,5-year-old boy who developed spontaneous chylothorax despite its unknown etiology while putting emphasis on the effectiveness of somatostatin in the patient's treatment.

## CASE REPORT

A 3,5-year-old male patient presented with coughing and wheezing that had been going on for the last few days before which he did not have any other symptoms except for constipation. The physical examination

revealed the following: body temperature: 37.1°C; pulse: 110 beats per minute; respiratory rate: 32 per minute; O<sub>2</sub> saturation: 92%; and blood pressure: 100/70 mmHg. The patient did not have any dysmorphic features and he had a medium general condition. While listening to the lungs for dyspnea and tachypnea, the respiratory sounds in the left lung decreased. As the examination of the left lung showed consolidation, the ultrasound examination of the thorax revealed an 8 cm-thick pleural effusion on the left (Figure 1).

The laboratory test results were as follows: hemoglobin: 12.3 mg/dL; hematocrit 34%; WBC 6580 mm<sup>3</sup> (78% PNL); urea 11 mg/dL; total protein 5.9 g/dL; albumin 3.2 g/dL; triglycerides 50 mg/dL; LDL 10 mg/dL; CRP (-), respectively. After inserting the chest tube, we applied underwater seal and found out that the patient's effusion liquid had a milky white look with pH 7, density 1015, triglycerides 2101 mg/dL, glucose 168 mg/dl, and WBC 590 mm<sup>3</sup> (82% lymphocytes) (Figure 2).

The pleural effusion liquid was unremarkable and PPD was negative. These findings confirmed the diagnosis of chylothorax. The thorax CT applied showed no etiologies. The patient started a fat-poor diet along with octreotide, a somatostatin analogue (3 mg/kg/hrs iv), and dobutamine (5 mg/kg/min iv) treatment. We maintained the somatostatin treatment for 2 weeks. Observing decline in the signs of a potential heart failure during the follow-up, we cut the dobutamine treatment. We terminated the chest tube application on the 25th day of the treatment as the signs of chyle came to an end. The patient was discharged and advised to attend the follow-up examinations. The findings of the physical and radiographic examinations were normal at the first follow-up after a week (Figure 3).



**Figure 1.** The dense view of consolidation in the lung in the first examination.



**Figure 2.** The view of the effusion liquid after the application of underwater seal.



**Figure 3.** The follow-up radiograph view after the treatment (week 4)

## DISCUSSION

Chylothorax, which is characterised by the accumulation of lymphatic fluid in the pleural space following damage in the ductus thoracicus, is one of the rare causes of pleural effusion. The incidence rate of chylothorax is unknown. The etiology of chylothorax is often seen as the post-cardio-thoracic surgery complications in children while left subclavian catheter applications, blunt chest trauma, stab wounds, gunshot wounds, and sudden hyperextension of the vertebrae may also lead to chylothorax (1-3). In addition, the disease may accompany Down syndrome, genetic disorders such as Turner's syndrome, malignancies such as lymphoma and neuroblastoma, and chronic infectious diseases like tuberculosis and histoplasmosis (4). In our case, we failed to determine the cause of chylothorax either in the patient's history, laboratory findings, or after the physical and radiological examinations. However, we think that the reason for the chylothorax development can be secondary to the continuous constipation-related contraction during discharge. The treatment method of chylothorax is poorly defined. Therefore, applied treatments are usually conservative. Reduced high-protein low-fat diet, total parenteral nutrition (TPN), somatostatin analogues (octreotide), and pleural drainage are among the existing major treatment options (5).

Octreotide is a long-acting somatostatin analogue. By influencing the central nervous system, gastrointestinal tract, and the organs of the endocrine system, it reduces the production of many hormones such as insulin, glucagon, growth hormone, thyroid stimulating hormone (TSH), gastrin, secretin, vasoactive intestinal peptide (VIP), motilin, and biliary and pancreatic polypeptide. Although the action mechanism is not known exactly, it may also reduce the production of chylous effusion by

decreasing venous blood flow in the liver and spleen, and by reducing fat absorption in the intestine (6, 7).

Octreotide may be applied in intravenous (iv) infusion doses from 0,3 to 10 mg/kg/hour while it may also be administered subcutaneously in 3 doses of 20 to 70 mg/kg/day. However, the most common method is to use the intravenous infusion (4, 8). While it is debatable how much the treatment will be continued, it is often advised to go on the treatment 3-5 days after the withdrawal of chylous fluid drainage (9).

On the first day of pleural drainage, we extracted 550ml of liquid (about 2 mL/kg/hr). Despite the decreasing amount of leakage after the dietary regulation at the follow-up, the chylous liquid continued to come out (1mL/kg/hr) upon which we started the somatostatin treatment on day 5 of the treatment and continued the somatostatin application for two weeks. With the somatostatin treatment, the chylous fluid extraction decreased, and eventually stopped.

In the treatment of resistant chylothorax cases, the risk of infection increases as the length of hospital stay becomes longer. Also the loss of oil-rich lymphatic fluid leads to fluid and electrolyte imbalance, malnutrition, and immunodeficiency. Buttiker et al. have detected 1000 cells/ml in the chylous effusion of the 92% of their 39 chylothorax cases and that 90% of these cells were lymphocytes (10). In chylothorax, prognosis may vary depending on the underlying etiologies. Chylothorax is reported to have subsided in more than 80% of cases within 4 weeks without requiring any surgical intervention (11). For those patients with active chylous after 4 weeks, following lymphangioscintigraphy, practitioners consider surgical treatment in accordance with the damage done (12). Our patient improved in the 4th week of the medical treatment without the need for surgical intervention.

Chylothorax may spontaneously develop in childhood. The use of somatostatin analogs with a chest tube in medical treatment will reduce the need for surgical intervention.

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