# *Cylothorax Developing Due to Thrombosis in The Subclavian Vein*

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***ABSTRACT***

*Chylothorax, which is a rare complication of central venous catheterization, is an accumulation of lymphatic fluid in the pleural space as a result of impairment of the integrity of ductus thoracicus. In this case report, we will look over chylothorax related to thrombus developing following subclavian vein catheterization.*

***Key words:*** *Chylothorax, thrombosis, central venous catheterization*

***Subklavyen Vendeki Trombüs Nedeniyle Şilotoraks***

***ÖZET***

*Santral venöz kateterizasyonun nadir bir komplikasyonu olan şilotoraks duktus torasikusun bütünlüğünün bozulması sonucu oluşan plevral aralıkta lenfatik sıvı birikimidir. Bu olgu raporunda subklaviyen ven kateterizasyonu sonrası gelişen trombusa bağlı şilotoraksı irdeleyeceğiz.*

***Anahtar kelimeler:*** *Şilotoraks, thrombus, santral venöz kateterizasyon*

## INTRODUCTION

Central venous catheterization (CVC) is an intervention often applied in operating theatres and intensive care units (ICU). Chylothorax, which is a rare complication of CVC, is an accumulation of lymphatic fluid in the pleural space as a result of impairment of the integrity of ductus thoracicus. A definite incidence has not yet been reported for chylothorax developing following catheterization. The rate in catheterization performed for cardiac and thoracic surgical interventions has been reported as 0,2-1%. The incidence of injury to the ductus thoracicus during CVC has been reported as 1-4,2%(1).

## CASE

A 33-year-old male patient was hospitalized at the ICU as the result of a traffic accident. On physical examination of the subject who was intubated and connected to the mechanical ventilator, he was comatose, pupils were anisocoric; he responded to pain localized at the right with extension on the left, The Glasgow coma scale (GCS) was 7 and he had paraplegia due to C2 spine fracture. The other physical examination findings were normal. Laboratory findings were also normal. He was placed on routine monitoring on his acceptance to ICU. A chest tube was inserted by the thoracic surgeons as he developed pneumothorax approximately a month later. Catheterization was applied to the left subclavian vein due to displacement of the catheter. A right subclavian catheter was inserted as a result of displacement of the subclavian catheter on the 32. day. On the second day of insertion of the right subclavian catheter, respiratory sounds and tidal volume decreased on the right and airway pressures increased (Fig. 1). Fluid collection was detected on chest x-ray and a chest tube was inserted on the right. Approximately 3500ml of chylous fluid was drained from the chest tube intermittently.

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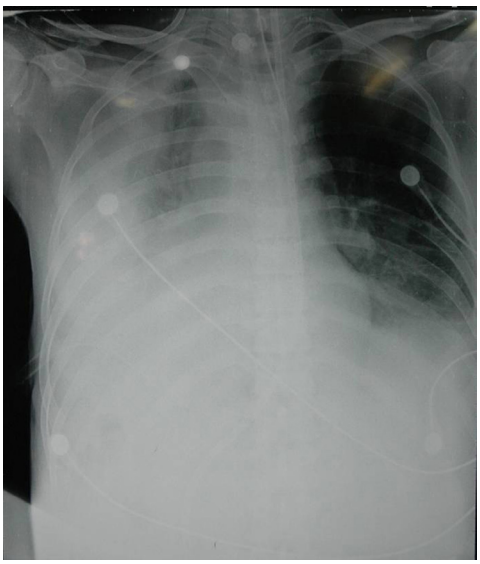

***Figure 1**. Appearance of the chylothorax in the chest radiograph of the patient.*

Triglyseride was found as 1584mg/dL in the fluid analysis. His enteral feeding was terminated and parenteral feeding was initiated. He was operated on by the thoracic surgery team on the 8th day as chylous drainage of 450- 900mL daily continued. This was suggested to be related to the absence of a perforation in ductus thoracicus. On the follow-ups, chylous fluid drainage decreased and eventually ceased. A thrombus was detected in the subclavian vein on the USG screening performed to enlighten the etiology. We continued the treatment with low molecular weight heparin that he had already been using.

## DISCUSSION

CVC is used mainly in operating theatres and intensive care units, chemotherapy and dialysis units, with the aims of monitoring during surgical procedures, for monitoring central venous pressure, for blood products and medication administrations when a peripheral venous route cannot be found, for aspiration of air emboli, total parenteral nutrition, dialysis and chemotherapeutic drug administration (2,3). Internal jugular vein and subclavian veins are often preferred with the aim of central venous cannulation (4). Complications as malposition, infection, hemothorax, pneumothorax, cardiac tamponade, vascular erosion, chylothorax, arrhythmia and death can be seen (4,5). Complication rates are related to catheters and their application and varies between 1-42% in different series (5). The experience of the person performing catheterization, the anatomical features of the patient and features of the catheter are the significant factors in the development of complications (5). Chylothorax is a rare complication of CVC that requires prompt treatment. Direct trauma of ductus thoracicus, congenital chylothorax and superior vena cava obstruction following CVC application or increased pressure in the ductus thoracicus are reported to be among the causes of chylothorax (6). Chylothorax usually develops on the right as ductus thoracicus is usually in the right hemithorax. We concluded that the cause of chylothorax in our case was the increased pressure in the ductus thoracicus due to the venous thrombus in the subclavian vein and perforation from the injured truncus along with injury of the right lymphatic truncus during the insertion of catheter. A milk-white appearance of pleural fluid in thoracentesis should suggest chylothorax and a definite diagnosis must be made based on a triglyseride level of above 110mg/dL in the biochemical analysis of the fluid, presence of chylomicron, a cholesterol/triglyseride rate of below 1 and the appearance of fat globules on microscopic examination with Sudan 3 staining, and treatment must be initiated promptly (7). In our case, the triglyseride level was found to be high in the biochemical analysis of the chylous fluid. Treatment of chylothorax includes drainage, low fat diet, terminating enteral feeding and initiating parenteral feeding and surgically ligation of ductus thoracicus in cases not responsive to therapy at the end of a 2-4 week of follow-up. In our case, enteral feeding was terminated and parenteral feeding was initiated. Ductus thoracicus was ligated as drainage continued.

The risk of venous thrombosis due to CVC has been reported as 5-10% (6). Risk factors for thrombosis and stenosis are; the type of the catheter (large, not flexible, polyethylene), administration of parenteral nutrition (especially fat and calcium-rich) and prolonged catheter application(6). The catheter itself and administered hyperosmolar fluids result in injury in the vessel wall with chemical and mechanical irritation on the intima of the vessel. Regeneration and/or perforation caused by the fibrotic tissue as the result of increased permeability and inflammation with the development of endovascular erosion occurs (8). Furthermore, respiration, cardiac rhythm, displacement of the catheter owing to

the movements of the neck and the arms may increase the incidence of vascular injury (8). Hui- Fang Hsu et al. reported the duration of thrombus development related to CVC as 48 days (8). Similarly, Berman et al. reported the duration of thrombus development during CVC as 2-90 days (6). In our case, chylothorax related to thrombus was detected approximately on the 34 day. Although venography is the golden standard in subclavian vein thrombosis, Doppler USG can also be used (9). We detected the thrombus non-invasively with doppler USG in our case. Antithrombotic agents and surgery are used for the treatment of thrombus and stenosis related to CVC. Breman W Jr et al. reported that thrombolytic drugs had suspicious effects in the treatment of catheter thrombus (6), whereas Wu et al. recommended IV urokinase, streptokinase and low molecular weight heparin in the treatment of intraluminal thrombus (10).

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