

A case of lung adenocarcinoma developing chylothorax after transthoracic Tru-cut biopsy

Transtorasik Tru-cut biyopsi sonrası şilotoraks gelişen akciğer adenokarsinom olgusu

Şerife Torun¹, Çağrı Kesim², Mehmet Dalokay Kılıç³

Institution where the research was done:

Başkent University Konya Application and Research Center, Konya, Türkiye

Author Affiliations:

¹Department of Pulmonary Diseases, Başkent University Konya Practice and Research Center, Konya, Türkiye

²Department of Radiology, Division of Interventional Radiology, Başkent University Konya Application and Research Center, Konya, Türkiye

³Department of Thoracic Surgery, Başkent University Faculty of Medicine, Ankara, Türkiye

ABSTRACT

Chylothoraces are mostly secondary to trauma and tumors, and rarely idiopathic. Chylothoraces secondary to lung tumors are mostly seen postoperatively. In this article, we, for the first time, present massive chylothorax developing after diagnostic transthoracic Tru-cut biopsy in a lung adenocarcinoma case. The patient was successfully treated with drainage and octreotide. In conclusion, it should be kept in mind that chylothorax can be also seen as a complication after interventional biopsy procedures; therefore, the patients should be followed carefully.

Keywords: Chylothorax, lung cancer, octreotide, transthoracic Tru-cut biopsy.

Chylothorax is characterized by chyle accumulation in the pleural space due to thoracic duct disruption.^[1] It may develop rarely due to external compression, while the main causes of chylothorax include trauma to the chest or thoracic spine, penetrating gunshot injuries, malignancies, and iatrogenic injuries to the thoracic duct during lung, esophagus or vertebral surgery, which has an increasing role recently.^[2,3]

In this article, we, for the first time, report a case of chylothorax developed after transthoracic Tru-cut biopsy and successfully treated by drainage and octreotide.

ÖZ

Şilotorakslar daha çok travma ve tümörlere sekonder gelişmekle birlikte, nadiren idiyopatik olarak görünürler. Akciğer tümörlerine sekonder şilotorakslar çoğunlukla ameliyat sonrası görülür. Bu yazıda, ilk kez bir adenokanser olgusuna yapılan tanı amaçlı transtorasik Tru-cut biyopsi sonrası gelişen masif şilotoraks sunuldu. Hasta oktreotid ve drenaj ile başarılı bir şekilde tedavi edildi. Sonuç olarak, şilotoraks girişimsel biyopsi işlemleri sonrası bir komplikasyon olarak gelişebilir; bu nedenle, hastalar dikkatli bir şekilde takip edilmelidir.

Anahtar sözcükler: Şilotoraks, akciğer kanseri, oktreotid, transtorasik Tru-cut biyopsi.

CASE REPORT

A 63-year-old female patient who was under annual follow-up due to a solitary pulmonary nodule was admitted to the chest diseases clinic with no current complaints two years ago. 18F-fluorodeoxyglucose positron emission tomography (FDG PET) was performed, and the lesion was found to be similar to the patient's computed tomography (CT) taken about a year ago. In the FDG PET report, an area of 29×17 mm in the posterobasal region of the right lower lobe had a significant FDG uptake (maximum standardized uptake value [SUV_{max}]:5.37). As the lesion was located peripherally, a CT-guided

Corresponding author: Şerife Torun.

E-mail: serifetor@hotmail.com

Doi: 10.5606/tgkdc.dergisi.2024.22556

Received: August 06, 2021

Accepted: November 29, 2021

Published online: November 06, 2023

Cite this article as: Torun Ş, Kesim Ç, Kılıç MD. A case of lung adenocarcinoma developing chylothorax after transthoracic Tru-cut biopsy. Turk Gogus Kalp Dama 2024;32(1):101-104. doi: 10.5606/tgkdc.dergisi.2024.22556.

©2024 All right reserved by the Turkish Society of Cardiovascular Surgery.



This is an open access article under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes (<http://creativecommons.org/licenses/by-nc/4.0/>).

transthoracic aspiration biopsy was planned. The lesion was punctured with the coaxial method using a 22-G (Gauge), 20-cm Chiba needle and a 19-G, 15-cm guiding needle through the 11th intercostal space (Figure 1a). Pneumothorax developed as soon as the needle was inserted into the lesion (Figure 1b). Since pneumothorax that developed subsequently was 1.2 cm at its widest point, the patient was observed in the ward for 5 h, lying on her back.

A thick effusion was noted that was measured as 1.2 cm in the posterior adjacency of the lesion on CT that was performed after biopsy (Figure 1c, d). The patient was discharged without any complaints and scheduled for follow-up for control of pneumothorax and a repeat biopsy after five days.

On her control CT, the lesion persisted in similar dimension, pneumothorax disappeared (Figure 2a), while a significant huge pleural effusion measuring as 6.8 cm in the widest portion was noted (Figure 2b).

An 8-Fr (French), 25-cm pigtail drainage catheter was placed at the level of the right costophrenic sinus of the patient for fluid drainage under ultrasound guidance by the Department of Interventional Radiology. A milky white 1.1 L of fluid was drained from the catheter. The biochemical analysis showed a fluid triglyceride level of 2,240 mg/dL, a serum triglyceride level of 52 mg/dL, and a fluid cholesterol level of 114 mg/dL. A diagnosis of chylothorax was made, and the patient was placed on a low-fat diet rich in medium-chain fatty acids. The amount of chylous

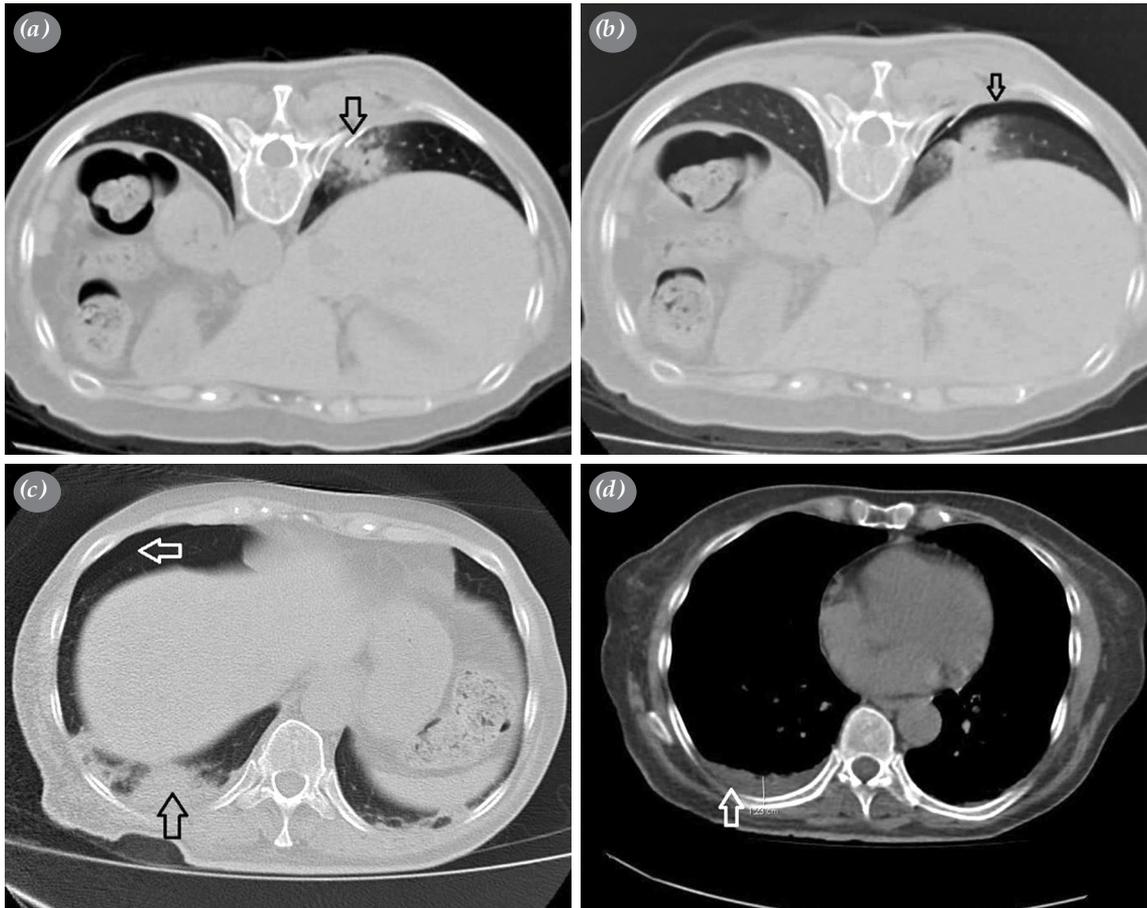


Figure 1. (a, b) Images of the Tru-cut biopsy performed on the date of March 5th, 2021. (a) A 22G, 20-cm Chiba needle appears to have entered the peripheral point of the lesion (black arrow). (b) Approximately 30 sec later, pneumothorax (black arrow) is observed in the control image obtained just before the 19G, 15-cm guiding needle is advanced into the lesion. Control images (c, d) were obtained 5 h after the procedure. The lesion is similar in size at this stage, with no significant reduction compared to 5 h ago (black arrow). (c) Minimal pneumothorax (white arrow) persists similarly, with no increase. (d) In the mediastinal window, 1.2 cm-thick extrapleural fluid (white arrow) adjacent to the lesion can be seen more clearly.

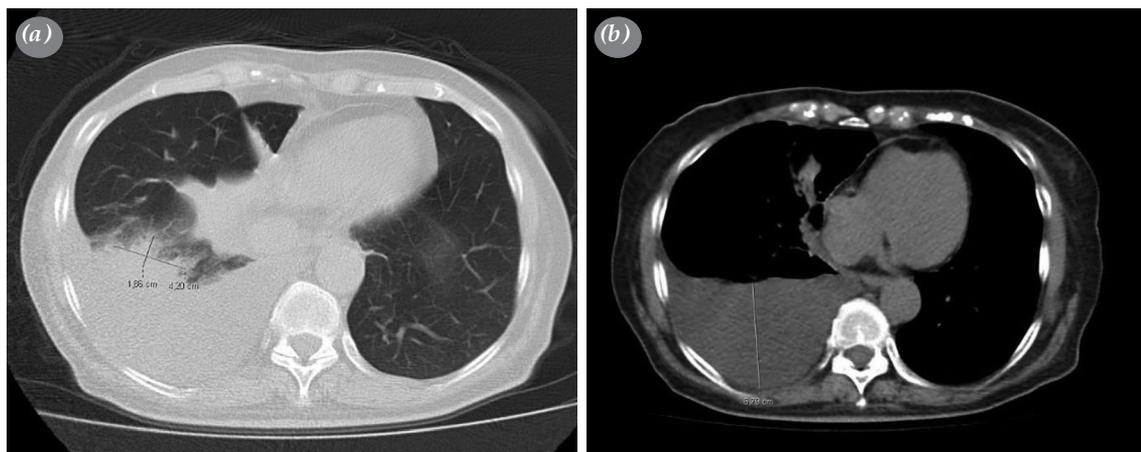


Figure 2. (a, b) Non-contrast-enhanced thoracic computed tomography images obtained on the date of March 10th, 2021. (a) The lesion adjacent to the pleural effusion is approximately 42×18 mm in size, although its borders cannot be clearly distinguished at this stage. (b) Image of 6.8-cm thick effusion in the mediastinal window, posterior to the right lung, causing almost half the lung volume reduction. At this stage, a pleural effusion drainage catheter was inserted in the right hemithorax and, due to chylous fluid, the patient was hospitalized, and treatment consisting of medium-chain fatty acids was started.

fluid drainage was 900 mL/day. Subcutaneous octreotide therapy (200 µg, t.i.d.) was initiated after the first day. The amount of drainage fluid gradually decreased to 50 mL on Day 6. The drainage catheter was removed after confirming that no more fluid existed in the right hemithorax. The second transthoracic Tru-cut biopsy was performed 10 days later. A lung adenocarcinoma was diagnosed and appropriate surgery treatment was planned. Since no lymph node involvement was observed, and right lower lobectomy was performed. The patient did not develop any complications after the operation and did not have any complaints. Chemotherapy was not applied to the patient, and she was scheduled for close follow-up.

DISCUSSION

Chylothorax development has been described in the literature in interventional procedures such as cervical lymph node biopsy, central venous cannulation, intercostal drain insertion, pacemaker insertion, and sympathectomy.^[4,5] The development of chylothorax after a transthoracic Tru-cut biopsy has not been reported before in the English literature.

Wan et al.^[6] suggested that the formation of chylothorax is related to thoracic duct variations in the pleura. In 17% of cases, the thoracic duct splits into two branches on the lower side of the thorax and, in 5% of patients, there are two thoracic ducts.^[6] In our case, a biopsy was performed from a region far

from the known location of ductus thoracicus or its branches. After the second biopsy, our patient was diagnosed with adenocarcinoma, and thoracic surgery was performed for a right lower lobectomy. The team that operated the patient remarked that there was no significant lymphatic network structure in the region that developed chylothorax, and the anatomy of the pleura and operation area appeared normal.

Several studies in the literature have discussed whether cancer stage and histological type are critical factors in the development of chylothorax.^[7] Pathological N2 status is the main cause of the development of chylothorax, and the histological type of adenocarcinoma is evident in patients who develop postoperative chylothorax.^[8,9] In our case, there was no lymph node involvement according to PET-CT results, but the histological type of the lesion was reported as an adenocarcinoma after the second biopsy.

The lesion was measured as 48×24 mm in the first CT of the patient, while it shrank to 26×20 mm in the control images obtained immediately before the second biopsy after chylothorax dissolved clinically. When the lesion was first observed on CT scan, images were obtained, while the patient was in the supine position, and the lesion appeared with wider consolidation. During the second Tru-cut biopsy, the lesion on the patient's back came to the upper part, as the patient was placed in a prone position for biopsy. Therefore, it can be implied that gravity has an effect

on the lesion in the prone position, when the lesion is displayed in the supine position, and the lesion appears more compact in the examination.

The reduction of the mass when the chylothorax regresses and the chylous leakage as soon as the needle enters the lesion suggest that it may be due to the invasion of lymphatic structures in this adenocarcinoma case and, thus, the mechanism can be explained in this way.

In conclusion, although preoperative chylothorax was successfully treated with drainage, oral lipid restriction, and octreotide treatment in our case, our knowledge about lymphatic anatomy and the lymphatic structure of tumors is still limited. It should be kept in mind that chylothorax can be also seen after an interventional biopsy procedure, and the patients should be followed properly.

Patient Consent for Publication: A written informed consent was obtained from the patient.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Author Contributions: Concept, design, processing, literature search, writing: Ş.T.; Analysis and/or interpretation, critical review: Ç.K., M.D.K.; Control: M.D.K.

Conflict of Interest: The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding: The authors received no financial support for the research and/or authorship of this article.

REFERENCES

1. Hillerdal G. Chylothorax and pseudochylothorax. *Eur Respir J* 1997;10:1157-62. doi: 10.1183/09031936.97.10051157.
2. Çubuk S, Yücel O, Yıldız R, Öztürk E, Demirbaş Ş. The rare case of a chylothorax caused by a retrosternal goiter. *Turk Gogus Kalp Dama* 2015;23:578-80. doi: 10.5606/tgkdc.dergisi.2015.10279.
3. Rudrappa M, Paul M. Chylothorax. [Updated 2023 Feb 21]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK459206/>.
4. Chinnock BF. Chylothorax: Case report and review of the literature. *J Emerg Med* 2003;24:259-62. doi: 10.1016/s0736-4679(02)00751-5.
5. Sapmaz E, Karataş O, Işık H. Right chylothorax after thoracic sympathectomy: A very rare case. *Turk Gogus Kalp Dama* 2018;26:484-6. doi: 10.5606/tgkdc.dergisi.2018.15313.
6. Wan L, Wang J, Zhao F, Fan K. Diagnosis and management of chylothorax after resection of lung cancer. *Zhongguo Fei Ai Za Zhi* 2009;12:905-6. doi: 10.3779/j.issn.1009-3419.2009.08.15.
7. Akin H, Olcmen A, Isgorucu O, Denizkiran I, Dincer I. Approach to patients with chylothorax complicating pulmonary resection. *Thorac Cardiovasc Surg* 2012;60:135-9. doi: 10.1055/s-0030-1270990.
8. Bryant AS, Minnich DJ, Wei B, Cerfolio RJ. The incidence and management of postoperative chylothorax after pulmonary resection and thoracic mediastinal lymph node dissection. *Ann Thorac Surg* 2014;98:232-5. doi: 10.1016/j.athoracsur.2014.03.003.
9. Chen C, Wang Z, Hao J, Hao X, Zhou J, Chen N, et al. Chylothorax after lung cancer surgery: A key factor influencing prognosis and quality of life. *Ann Thorac Cardiovasc Surg* 2020;26:303-10. doi: 10.5761/atcs.ra.20-00039.