Turkish Journal of Thoracic and Cardiovascular Surgery 2023;31(1):128-130

Case Report / Olgu Sunumu

A rare pinch-off case embolized to the pulmonary artery

Pulmoner artere embolize olan nadir bir pinch-off olgusu

Aykhan Abbasov[1], Celalettin Kocatürk[2], Adem Uçar[3], Hakan Yanar[1]

[1]Department of General Surgery, Liv Hospital Ulus, Istanbul, Türkiye
[2]Department of Thoracic Surgery, Liv Hospital Ulus, Istanbul, Türkiye
[3]Department of Radiology, Liv Hospital Ulus, Istanbul, Türkiye

ABSTRACT

The pinch-off syndrome is defined as the embolization of the central catheter inserted via the subclavian approach due to the mechanical compression between the clavicle, the first rib, the subclavius muscle, and the costoclavicular ligament. Embolization to the pulmonary artery is an extremely rare condition. In this article, we present a rare case with ovarian cancer who had multiple metastases both locally and lungs, the port catheter was fractured into three parts, the proximal part was removed, the middle part was left between the subclavian vein and the skin, and the long distal part was embolized to the pulmonary artery.

Keywords: Pinch-off syndrome, port catheter complication, pulmonary artery embolization.

ÖZ

Pinch-off sendromu, subklaviyen yol ile takılan santral kateterin klavikula, birinci kosta, subklavius kası ve kostaklaviküler ligament arasındaki mekanik kompresyona bağlı olarak embolizasyonu olarak tanımlanmaktadır. Pulmoner artere embolizasyonu oldukça nadir bir durumdur. Bu yazıda, port kateterinin koparak üç parçaya ayrıldığı, proksimal parçasının çıkarıldığı, orta parçasının subklaviyen ven ile cilt arasında kaldığı ve distal parçasının pulmoner artere embolize olduğu lokal ve akciğere çoklu metastaz yapmış olan nadir bir over kanseri olgusu sunuldu.

Anahtar sözcükler: Pinch-off sendromu, port kateteri komplikasyonu, pulmoner arter embolizasyonu.

Totally implantable venous access devices are widely used in long-term drug administration, as they provide safe and easily accessible vascular intervention in patients who need parenteral nutrition and transfusion.[1] It is a rare condition that port fragments are fractured and embolized, but can lead to severe complications.[2]

The embolization of the fractured catheter part into the ventricle can cause severe arrhythmias and embolism.[2] Currently, with the help of advanced catheters used in interventional radiology and cardiology, the fractured catheter part may be successfully removed percutaneously. Fractured catheter parts that cannot be removed with the interventional method may require major surgical procedures.

Totally implantable vascular catheters were first defined by Niederhuber et al. in 1982.[3] Chemotherapy port catheters play an effective role in the treatment of oncology and hematology patients by providing a long-term and reliable venous access route. In general, these catheters have the advantage of being placed with local anesthesia, low discomfort to the patient, low complication rate, and continued treatment at home on the same day.[1] The most common port complications are catheter occlusion or absence of blood return from the catheter, thrombosis, and infection.[1] The rare complication is the port fracturing and pulmonary embolism.

In this article, we present a non-operatively followed Pinch-off syndrome case not causing severe ventricular arrhythmias.

Corresponding author: Aykhan Abbasov.
E-mail: dr.ayxan.abbasov@gmail.com

Doi: 10.5606/tgkdc.dergisi.2023.20368

Received: June 27, 2020
Accepted: October 12, 2020
Published online: January 30, 2023

Cite this article as: Abbasov A, Kocatürk C, Uçar A, Yanar H. A rare pinch-off case embolized to the pulmonary artery. TurkGogusKalpDama2023;31(1):128-130.TurkGogusKalpDama2023;31(1):128-130.doi: 10.5606/tgkdc.dergisi.2023.20368

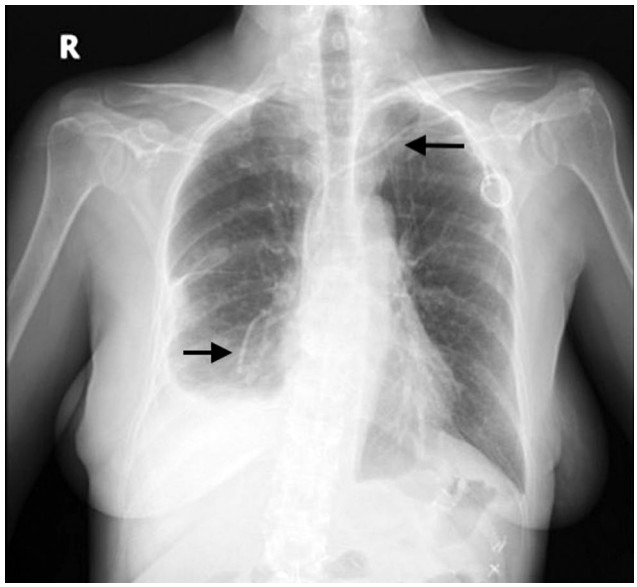

Figure 1. Chest X-ray showing new implantable central venous catheter inserted into the left subclavian vein (arrow in upper right corner) and fracture catheter fragment embolized to the middle lobe branch of the right segmentary pulmonary artery (arrow in lower left corner).

CASE REPORT

A 53-year-old female patient underwent debulking surgery in June 1998 due to Stage IIIC ovarian cancer. The patient who received six cycles of adjuvant therapy (carboplatin and paclitaxel) in the postoperative period developed recurrence after two years in May 2000, and reoperation was performed. The patient was re-administered carboplatin plus paclitaxel regimen. Due to recurrent local recurrences, repetitive operations were performed in 2001, 2002, 2006, 2009, 2010, 2012, and 2013. Finally, the patient underwent surgery in July 2014, and a port was placed in the right subclavian vein and adjuvant chemotherapy was applied.

For the first time in 2002, a port catheter was inserted into the right subclavian vein for chemotherapy at Johns Hopkins Hospital and was removed, as it was blocked in 2005. When the part of the chemotherapy port catheter was fractured and remained in the superior vena cava, the patient was started on warfarin treatment. In the control imaging studies during the treatment period, the catheter was displaced from vena cava superior to the right pulmonary artery. Due to the patient's recurrent relapse, no surgical intervention was planned and the patient was followed to remove the catheter. The patient continued to use warfarin until 2017. As chemotherapy and surgical interventions for recurrent relapses were beneficial for the patient and survival was achieved, a second port catheter was inserted through the right subclavian vein again in 2017 in another center to give the patient more comfortable chemotherapy treatment. However, this catheter was removed in February 2019 due to the development of infection.

The patient was admitted to our clinic urgently with abdominal pain and vomiting in June 2019. She was diagnosed with an ileoileal fistula following thorough examinations. Since the patient had multiple operations due to recurrence and her clinic status did not require

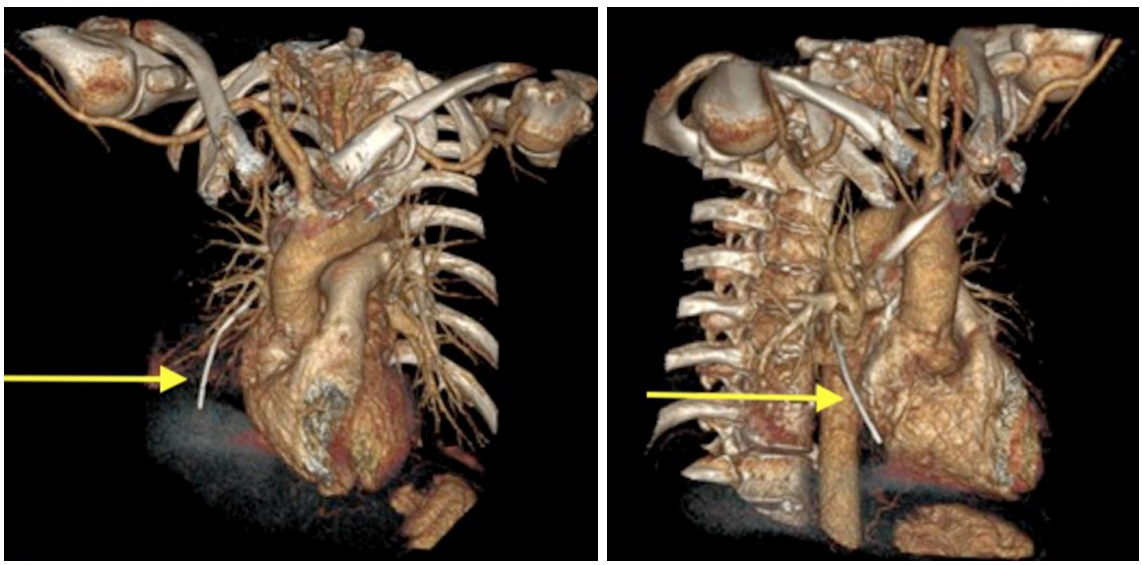

Figure 2. Computed tomography showing fracture catheter fragment embolized to the middle lobe branch of the right pulmonary artery (yellow arrow).

surgery, an emergency operation was not considered and was treated medically. During the hospitalization, positron emission tomography (PET)-computed tomography (CT) revealed multiple lesions showing metastasis and pleural effusion in the lungs.

An adenocarcinoma (similar to ovarian carcinoma metastasis) was detected in the cytology of the pleural effusion. It was decided to perform systemic chemotherapy by inserting a port catheter again. During imaging studies, the distal tip of the catheter was seen in the middle lobe branch of the right pulmonary artery (Figures 1 and 2). We recommended the patient to remove the catheter, but the patient refused. The subclavian approach was preferred, as the patient had eczema on her neck. Therefore, a port catheter was inserted through the left subclavian vein.

DISCUSSION

Chemotherapy port catheters are preferred for patients who require continuous total parenteral nutrition or receive chemotherapy treatment.[4] In addition to the benefits provided by port catheters, chemotherapy can also occur with early and late complications.[4] In addition to early complication such as skin infections, superficial hematoma, pneumothorax, hemothorax, improper placement of the port chamber, cardiac perforation, sepsis, arrhythmia, ductus thoracicus injury, and nerve damage (brachial plexus and phrenic nerve), as well as late complications such as venous thrombosis, extravasation, and catheter rupture are also encountered.[2]

Pinch-off syndrome develops as a result of the central catheter breaking due to compression between the clavicle, the first rib, subclavius muscle, and costoclavicular ligament. Aitken and Minton[5] first described the pinch-off sign on the X-ray in 1984. Catheter rupture is a rare condition and, in a report in Türkiye, its rate was reported as 5.7%.[6]

Since it often causes arrhythmia, the diagnosis of catheter rupture is usually made while in the right ventricle. The catheter piece may rarely go into the pulmonary artery system and, at this stage, the severed catheter part can be removed by interventional radiologists via the endoluminal route. Since the risk of pulmonary embolism is high, it is not recommended to follow the catheter part without removing it. However, catheter rupture developed in our patient was not removed due to frequent recurrence of the carcinoma of the patient and receiving chemotherapy, and warfarin was started and the patient was followed. Warfarin treatment was discontinued after 12 years, and the patient was free from complications for a long time. The patient was admitted to our clinic three years after; i.e., 15 years after catheter rupture. In the examination, the distal parts of the catheter were in the right pulmonary artery branches and the proximal parts of the catheter were between the subcutaneous-subclavian vein. It is quite interesting that the patient's catheter was followed without being removed, and no complications developed during this time. It was thought that the complication might not have developed due to the epithelialization of the catheter.

In conclusion, to the best of our knowledge, this is the first case in the literature on this subject and we found this case worth presenting.

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

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

Author Contributions: Idea/concept: A.A., C.K., A.U.; Design, control/supervision, references and fundings: A.A., C.K.; Data collection and/or processing: A.A., H.Y.; Analysis and/or interpretation: A.A., C.K., H.Y.; Literature review, writing the article: A.A.; Critical review: A.A., C.K., A.U., H.Y.; Materials: A.A., A.U., H.Y.

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. Kock HJ, Pietsch M, Krause U, Wilke H, Eigler FW. Implantable vascular access systems: Experience in 1500 patients with totally implanted central venous port systems. World J Surg 1998;22:12-6. doi: 10.1007/s002689900342.
2. Kim JT, Oh TY, Chang WH, Jeong YK. Clinical review and analysis of complications of totally implantable venous access devices for chemotherapy. Med Oncol 2012;29:1361-4. doi: 10.1007/s12032-011-9887-y.
3. Niederhuber JE, Ensminger W, Gyves JW, Liepman M, Doan K, Cozzi E. Totally implanted venous and arterial access system to replace external catheters in cancer treatment. Surgery 1982;92:706-12.
4. Lorch H, Zwaan M, Kagel C, Weiss HD. Central venous access ports placed by interventional radiologists: Experience with 125 consecutive patients. Cardiovasc Intervent Radiol 2001;24:180-4. doi: 10.1007/s002700001721.
5. Aitken DR, Minton JP. The "pinch-off sign": A warning of impending problems with permanent subclavian catheters. Am J Surg 1984;148:633-6. doi: 10.1016/0002-9610(84)90340-4.
6. Velioğlu Y, Yüksel A, Sınmaz E. Complications and management strategies of totally implantable venous access port insertion through percutaneous subclavian vein. Turk Gogus Kalp Dama 2019;27:499-507. doi: 10.5606/tgkdc.dergisi.2019.17972.