

Case report-Olgu sunumu

Unusual complication of the subclavian central venous catheter: Pinch-off syndrome.

Subklavian santral venöz port kateterinin nadir bir komplikasyonu: Pinch-off sendromu

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Abstract

Mechanical compression of the central catheter between the clavicle and the first rib with subclavius muscle and costoclavicular ligament is called the pinch-off syndrome. This complication is very rare. Pinch-off syndrome can be recognized by intermittent infusion difficulties by the change of shoulder position during drug injection, and swelling of chest wall at the insertion site. In this article, we aimed to present a case of a patient who had a terminal stage colon tumor and catheter embolization to the heart from an implanted venous port, in the light of the current literature.

Keywords: Pinch-off syndrome, venous catheter complication, catheter fracture.

Özet

Santral kateterin klavikula, birinci kosta, subklavius kası ve kostaklavikular ligament arasındaki mekanik kompresyonu Pinch-off sendromu olarak adlandırılır. Bu komplikasyon oldukça nadir görülen bir komplikasyondur. Pinch-off sendromu ilaç enjeksiyonu sırasında omuz hareketleri ile değişen aralıklı infüzyon zorluğundan ve giriş bölgesindeki göğüs duvarı sisliğinden fark edilebilir. Bu makalede, terminal kolon kanserli ve takılan venöz port kateterinin kardiyak embolizasyona neden olduğu bir olguyu güncel literatür ışığında sunmayı amaçladık.

Anahtar sözcükler: Pinch-off sendromu, venöz kateter komplikasyonu, kateter kırılması.

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Introduction

Central venous port catheters are frequently used in oncologic patients. They are very useful for frequent, multiple and long-term intravenous infusions of drugs which could potentially cause phlebitis. Although, there are some complications related to subclavian approach such as arterial puncture, hematoma, pneumothorax, and hemothorax, the subclavian approach for central venous port catheters is less likely to result in catheter related infection than the internal jugular and femoral venous approach [1, 2]. Pinch-off syndrome is a rare complication of central venous port catheters. It develops due to compression of the venous catheter between the clavicle and the first rib by subclavius muscle and costoclavicular ligament [3]. In this study we aimed to present a case of a patient who had a terminal stage colon tumor and Pinch-off syndrome from an implanted venous port, together with the review of the literature.

Case report

A 55 year-old woman was admitted to our clinic for catheter occlusion. She had an established diagnosis of colon cancer and right hemicolectomy was performed a year ago. After hemicolectomy central venous port catheter (Polyoxymethylene In-Port® Access Port, Haubeger, France) was inserted via right subclavian venous approach. She had received twelve chemotherapy treatments via this catheter along one year and then chemotherapy was stopped six months ago. During routine controls lung metastasis was detected and chemotherapy was planned again. However, it was detected that catheter was occluded. Although port catheter had seemed to be in normal position in the previous radiographies until two months ago (Figure 1), new chest radiography revealed a fractured catheter with the proximal part (7 cm) of the catheter in situ and the distal end of the catheter in the right atrium (Figure 2).

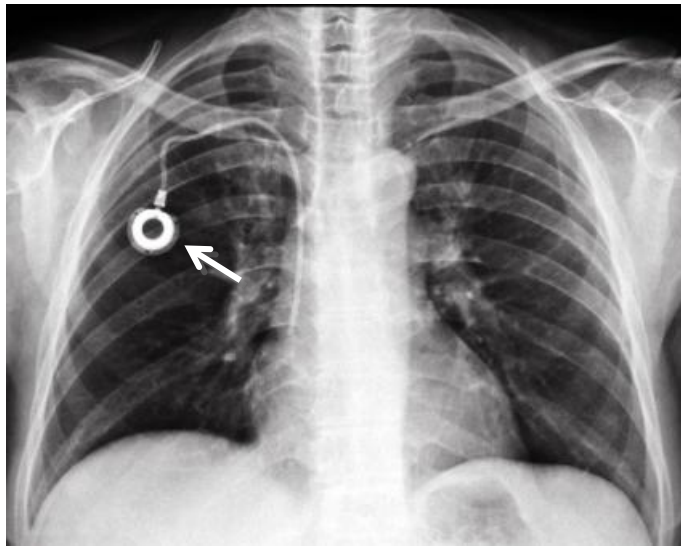


Figure 1. Initial chest radiogram after central venous port catheter insertion. Catheter seemed to be in normal position.

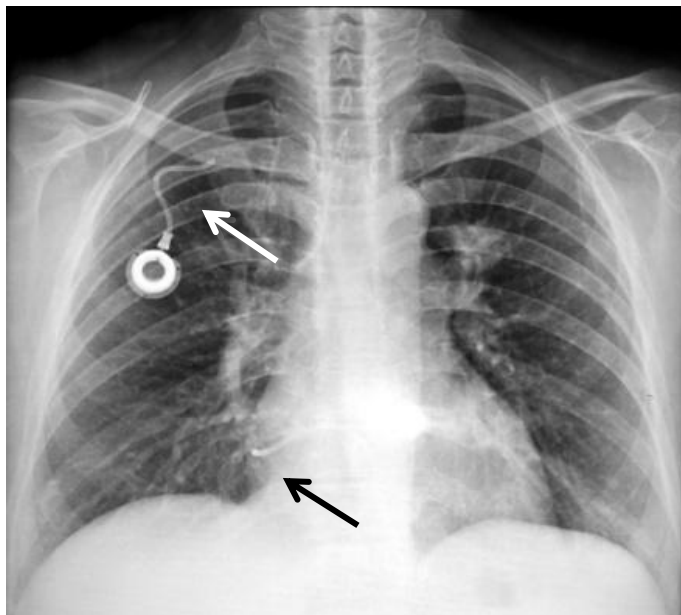


Figure 2. Chest radiogram after 12 months from insertion of the catheter shows fractured catheter (white arrow) and fragment of the catheter in the right atrium (black arrow).

Transthoracic echocardiogram showed that there was a fractured part of the catheter, which was immobile and adherent to the free wall of right atrium (Figure 3). In the operation room, under local anesthesia the proximal part of the catheter was removed and another venous port catheter was implied via right subclavian venous approach (Figure 4). No complication was observed during and after procedures. Removal of the distal part of the fractured catheter was tried under angiographic guidance, however, the catheter could not be moved as the catheter was strictly adherent to right atrium free wall. Anticoagulation treatment was started and the patient was discharged. The patient was followed for six months and no catheter related complication was detected.

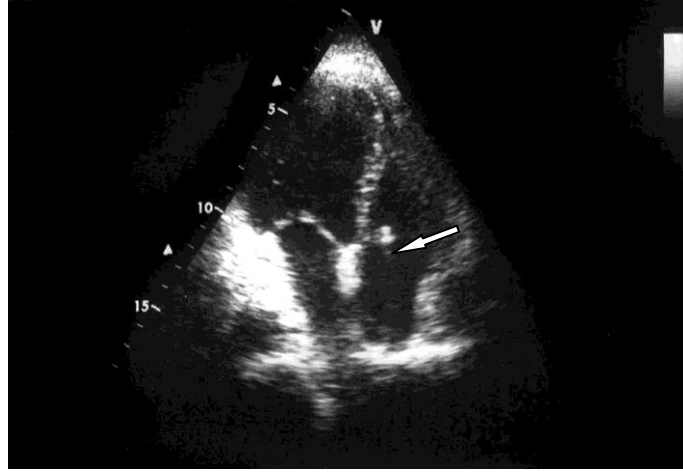


Figure 3. Transthoracic echocardiogram of the patient. White arrow shows fragment of the catheter in the right atrium.

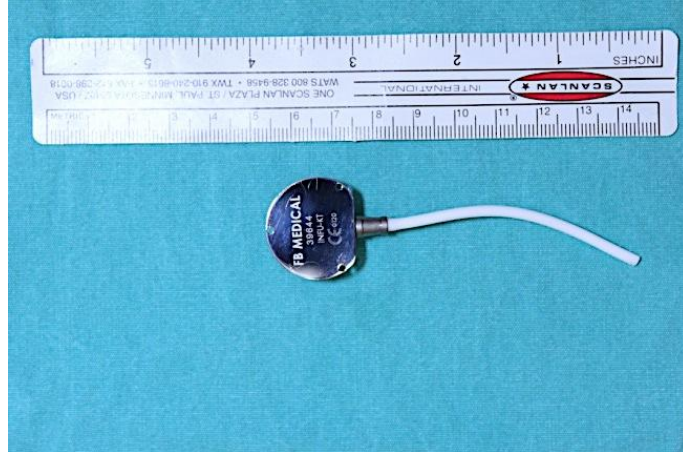


Figure 4. Removed part of the central venous catheter.

Discussion

Central venous port catheters, which are located to the subclavian vein, are very useful for parenteral nutrition, rapid fluid, and chemotherapy administration. Complications of venous port catheter have frequently been related with operational techniques, dislocations, infections, thrombosis, obstructions, leakages and extravasations [4]. However, pinch-off syndrome is found as a rare complication. Kock et al. [4] reported that catheter infections occurred in 3.2%, catheter thrombosis occurred in 2.4%, and pinch-off syndrome occurred in 0.2% of the 1500 patients with catheter.

Mechanical compression of the catheter between the clavicle and the first rib by

subclavius muscle and costoclavicular ligament is called the pinch-off syndrome or sign [3]. This area is called as cervico-axillary canal. A dispositioned catheter passes through cervico-axillary canal outside the subclavian vein before it penetrates the subclavian vein medially. Lateral insertion of the catheter can minimize the compression of catheter. Because the angle between the first rib and clavicle is wider in the lateral than medial. In case of compression, shoulder movement becomes critical. Shoulder position can change the angle and catheter flow is affected. Pinch-off can be recognized on chest radiography by observing luminal narrowing as the catheter passes between the clavicle and the first rib [5]. There is a radiographic catheter distortion scale developed by Hinke [6]. This scale includes Grades between 0 and 3: Grade 0, catheter follows a normal course without narrowing; Grade 1, catheter shows any degree of deviation from a single curved course without luminal narrowing; Grade 2, there is some degree of luminal narrowing while passing beneath the clavicle; Grade 3, catheter transected between the first rib and clavicle with embolization of the distal catheter. Usually, first sign of the pinch-off syndrome is affected catheter flow by changing the shoulder position. Careful nurse follow-up during drug infusion may allow early detection of the pinch-off syndrome. Other early warning symptoms of pinch-off syndrome and transection are intermittent resistance, chest wall swelling at the insertion site, and premature ventricular contractions in case of embolization to the heart. Mobile embolic catheter should be removed as soon as possible. However, removing of the immobile embolic catheter might be not necessary in some situations such as patient with multiple metastases and patient with low life expectancy. In our case, lung metastasis was detected after surgery of colon tumor. The intra atrial catheter was immobile and arrhythmia did not occur during our follow up period. The case, who was totally asymptomatic was discussed with a cardiologist. Consensus was that extraction of the catheter deemed unnecessary. The follow up period of the patient has been going uneventful until now.

As a consequence, pinch-off syndrome is a rare complication of subclavian central port catheters. Lateral subclavian approach can minimize this complication. Carefully, follow-up during drug infusion is important in early detection of pinch-off syndrome. All mobile catheters, which could be the site of potential embolic complications, should be removed as soon as possible; however, decision to extract an immobile catheter is determined not only by embolic risk but also by other patient's characteristics.

References

1. Preventing complications of central venous catheterization. McGee DC, Gould MK. *N Engl J Med* 2003; 348: 1123-33.
2. Girbes AR, Polderman KH. Mechanical and infectious complications of central venous catheters. *Minerva Anesthesiol* 2003; 69: 330-2.
3. Aitken DR, Minton JP. The "pinch-off sign": a warning of impending problems with permanent subclavian catheters. *Am J Surg* 1984; 148: 633-6.
4. 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.
5. Hinke DH, Zandt-Stastny DA, Goodman LR, Quebbeman EJ, Krzywda EA, Andris DA. Pinch-off syndrome: a complication of implantable subclavian venous access devices. *Radiology* 1990; 177: 353-6.
6. Hinke DH, Zandt-Stastny DA, Goodman LR, Quebbeman EJ, Krzywda EA, Andris DA. Pinch-off syndrome: a complication of implantable subclavian venous access devices. *Radiology*. 1990; 177: 353-6.