

Olgu Sunumu

A Rare Catheter Complication: Breakage of the Central Venous Catheter

Onur AVCI*[®], Canan BARAN ÜNAL*[®], Salih YILDIRIM*[®], Mehmet Fatih YÖRÜK*[®]

ABSTRACT

Central venous catheters (CVC) are commonly used for infusion therapies, nutritional support, hemodynamic monitorisation, as temporary transvenous pacemakers, plasmapheresis or hemodialysis, mostly in intensive care units and operating rooms. In this case of a 73- year -old female patient who was monitorised for right median cerebral artery infarct, a large portion of the catheter was broken and embolized in patient's venous structures while changing the central catheter in the right subclavian vein.

Keywords: central venous catheter (CVC), complication, embolism

ÖZ

Nadir Görülen Kateter Komplikasyonu: Santral Venöz Kateterin Kopması

Santral venöz kateterler (SVK); çoğunlukla yoğun bakım ünitelerinde ve ameliyat odalarında infüzyon terapisi, nutrisyonel destek, hemodinamik monitörizasyon, geçici transvenöz kalp pili, plazmaferez veya hemodiyaliz gerektiren hastalarda güvenli yöntem olduğundan yaygın olarak kullanılırlar. Sağ median cerebral arter enfarktüsü nedeni ile takip etmekte olduğumuz 73 yaşındaki kadın hastanın sağ subklavian vendeki santral kateterin değişimi sırasında kateterin büyük bir kısmının koparak hastanın venöz yapıları içinde embolize olduğu olguyu literatür ışığında tartışmak istedik.

Anahtar kelimeler: santral venöz kateter (SVK), komplikasyon, embolizasyon

INTRODUCTION

Central venous catheters (CVC) are commonly used for infusion therapies, nutritional support, hemodynamic monitorisation, as temporary transvenous pacemakers, plasmapheresis or hemodialysis, mostly in intensive care units and operating rooms. It provides enough fluid and blood supply and is commonly used for patients on total parenteral nutrition in intensive care units. Common locations for venous cannulation are internal and external jugular, subclavian, femoral and brachial veins. Seldinger's technique is often used for the placing of central venous catheters.

During the cannulation procedure for CVC and in early term, complications like infection, air or thrombosis embolism, arrhythmia, hematoma, pneumothorax, hemothorax, hydrothorax, chylothorax, cardiac perforation, cardiac tamponade, adjacent nerve and vessel trauma may occur^[1]. Rare and deadly complications like pleural effusion, guidewire escaping into the vessel, vena cava superior perforation, aortic injury, acute cardiac tamponade and catheter breakage have also been reported^[2-4]. In late term, venous thrombosis, vena cava superior syndrome, endocarditis, sepsis and secondary complications related to these can occur^[5].

*Numune Hastanesi Anesteziyoloji ve Reanimasyon Bölümü

Yazışma adresi: Uzm. Dr. Onur Avci, Kardeşler Mah. Birlik Cad. Eğriköprü 2 Konakları No: 85
A Blok D: 20 58000 Sivas

e-mail: dronuravci@gmail.com

ORCIDLER: O. A. 0000-0003-0743-754X, C. B. Ü. 0000-0002-1793-5705,
S. Y. 0000-0003-2703-1926, M. F. Y. 0000-0002-7088-8610

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CASE PRESENTATION

A triple-lumen catheter was placed on the second day of hospitalization in the right subclavian vein of a 73-year-old female patient, who was monitored for right median cerebral artery infarct with intubation and mechanical ventilation, to achieve comfortable parenteral treatment and monitoring of central venous pressure. On the tenth day, a catheter change was ordered when a leak was observed. But, during the retraction procedure, the catheter broke where it was sutured to the skin. The patient was consulted to a cardiovascular surgeon. Posteroanterior chest X-rays were obtained. The broken catheter was seen inside the right subclavian vein (Figure 1). Cardiovascular surgery specialists tried to retrieve the broken catheter with a skin incision with failure. Next morning, the catheter couldn't be seen on PA chest X-ray. Again, it couldn't be seen in a neck/thorax tomography. After that, an abdomen X-ray was taken to the left-hemiplegic patient. This X-ray revealed a 30 cm long and 4 mm thick image of a catheter extending from the left internal iliac vein up to the vena cava inferior on liver's level (Figure 2). After consulting cardiovascular surgery, antiagregant treatment was recommended because of the short survival time, with surgical intervention if the catheter would change location. Abdominal X-rays taken every three days, demonstrated that the catheter remained stable in the same place.

But, on the 28th day of follow-up without any surgi-



Figure 1. The broken catheter was seen inside the right subclavian vein.

cal interventions to the catheter, the patient was lost due to pseudomonas pneumonia.

DISCUSSION

Catheter occlusion, fracture, extravasation and embolization, venous thrombosis and infection are complications related to the usage of port catheters [6,7]. Embolization due to catheter breakage is a rare and serious complication and its incidence in adults has been reported as 0,4-1,8% [8]. Patients may be asymptomatic, but may also present with serious symptoms. Fracture and breakage due to the compression of a catheter between the clavicle and the first rib is called 'pinch-off syndrome' and may present with infraclavicular pain, sensory loss in arm and resistance to infusion. Earliest radiologic hint is the indentation sign (pinch-off sign) due to the fracture under the clavicle. This is a precursor of a possible fracture later on. From 3358 port catheters placed by Lin et al. over the span of 3 years, 73 fractures were reported, and 1% of the subclavian catheters showed the pinch-off sign [9]. The broken part should be taken out in early term, as it can cause embolisms, endocarditis, vascular perforation and serious cardiac arrhythmia. Suitable



Figure 2. A 30 cm long and 4 mm thick image of a catheter from the left internal iliac vein until the vena cava inferior on liver's level.

treatment methods for this are open surgery and percutaneous endovascular techniques^[9,10]. Helix basket, loop lasso, biopsy forceps and hook catheter can be used for percutaneous endovascular removal of embolized foreign matters. Most popular tools are 'goose neck' lasso, and a loop lasso. This loop lasso technique has high success and low complication rates. Pei et al. successfully removed dislocated venous port catheters in 25 patients through percutaneous route. All catheter removal processes were performed with fluoroscopy-guided En Snare(R) endovascular snare inserted through 10F vascular sheath placed in right femoral vein with or without pigtail catheters, and total procedure times were reported as 5-50 minutes (median 27.8 minutes)^[10]. Out of 92 adult patients, Cheng et al. used a loop lasso catheter for retrieving broken venous port catheter pieces from 66 patients through percutaneous route, and reported 98% success and 3,3% complication rates^[11].

Seldinger's technique is the most often used method for the placement of catheters. Most important factors causing complications are badly performed techniques, physicians' inadequate experience and poor quality of the materials. Complications may be seen due to the invasive nature of the procedure despite the physician's experience. Structural properties of the catheter used for the cannulation process are important development for any possible complications. During the cannulation process, rules of asepsis and antisepsis should be optimally followed, the catheter should be washed with heparin solutions and for patients requiring long-term monitorization, catheters should be replaced immediately if there is any suspicion of infection. Proper radiologic examinations should be done for the early detection of complications related to central venous cannulation process.

CONCLUSION

Embolization caused by fractured venous port catheters is a rare but severe complication. Compared to surgical approaches like general anesthesia, thoracotomy and access to cardio-pulmonary pump, where morbidity and mortality rates increase, percutaneous endovascular techniques are faster and safer approaches for the removal of embolized catheters. For

this reason, removing the fractured catheter with a loop lasso through percutaneous route is a more successful and effective technique which also reduces the need for surgical procedures. Percutaneous and surgical methods were evaluated for the presented case. However, due to the patient's elder age, development of multiple organ failure, pure general condition and short survival time, conservative treatment with antiagregant and catheter localization monitoring was planned for the patient after considering anesthetic and surgical complications.

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