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Case report / Olgu Sunumu

Transjugular removal of an intravascular catheter fragment using a snare loop catheter

İntravasküler kateter parçasının snare loop kateter kullanılarak transjuguler yolla çıkarılması

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Central venous catheters are widely used for various purposes, including central venous pressure measurement, total parenteral nutrition, blood sampling, transfusion of blood products, chemotherapy or long-term antibiotic therapy. Catheter fragmentation, a rare complication, results in an urgent interventional or surgical removal. The distal tip of a femoral catheter was accidentally severed in a 4-month-old girl with the diagnosis of tetralogy of Fallot after emergency shunt operation. Posteroanterior X-ray revealed a catheter fragment in the left iliac vein. The fragment was successfully removed transjugularly through a sheath inserted into the right internal jugular vein advanced through vena cava superior, the right atrium and vena kava inferior, using a 4F Amplatz Goose Neck Snare catheter. No complication was seen during the procedure. Transcatheter removal of the foreign body is a safe and effective method. It is possible to remove the foreign body through several arterial and venous routes. In selected patients, transjugular route can be preferred to capture the foreign body thanks to its ease of access of and appropriate angle.

Key words: Catheter; snare; transcatheter approach.

Santral venöz kateterler santral venöz basınç ölçümü, total parenteral beslenme, kan örneklerinin alınması, kan ürünlerinin transfüzyonu, kemoterapi ve uzun süreli antibiyotik tedavisi dahil olmak üzere, çok çeşitli amaçlar için kullanılır. Kateterin fragmante olması nadir görülen bir komplikasyon olmakla birlikte, acilen girişimsel veya cerrahi yolla çıkarılması gerekmektedir. Fallot tetralojisi tanısı ile acil şant ameliyatı yapılan dört aylık kız hastada femoral kateterin distal ucu yanlışlıkla koptu. Çekilen arka-ön grafi ile kateterin parçası sol iliyak ven içerisinde tespit edildi. Parça sağ juguler vene yerleştirilen kılıf aracılığıyla vena kava superior, sağ atriyum, vena kava inferiordan ilerletilerek 4F Amplatz Goose Neck Snare kullanılarak transjuguler yolla başarılı şekilde çıkartıldı. İşlem sırasında bir komplikasyon gelişmedi. Transkateter yolla yabancı cisim çıkartılması güvenli ve etkili bir yöntemdir. Yabancı cismin çıkarılması birçok farklı arteriyel ve venöz yollarla mümkündür. Belirli hastalarda ulaşım kolaylığı ve yabancı cismi yakalama açısının uygun olması nedeniyle, transjuguler yol tercih edilebilir.

Anahtar sözcükler: Kateter; snare; transkateter yaklaşım.

Central venous catheters (CVC) are used extensively for many chronic and hematological conditions and have various purposes, including central venous pressure measurement, total parenteral nutrition, blood sampling, transfusion of blood products, chemotherapy, or long-term antibiotic therapy.[1] The implantation of these devices is occasionally associated with immediate complications such as infection, catheter malfunction, arterial or venous injury, and venous thrombosis.[2] In addition, catheter fragmentation, a rare complication, causes urgent interventional or surgical removal.[1] Percutaneous removal, which is preferred over a thoracotomy, is an easy, reliable, effective method that is more cosmetically advantageous.[1,3]

This article presents a case of successful catheter fragment removal by a transjugular interventional approach.

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CASE REPORT

A four-month-old girl, who was being followed up because of tetralogy of Fallot, was admitted to our clinic with hypoxic attacks that had been constantly repeating over the last month. The patient was then hospitalized in the intensive care unit (ICU) due to a hypoxic spell that occurred while undergoing echocardiography. Because of these frequent and repeated hypoxic spells that had been unresponsive to medical therapy, the patient underwent a modified right Blalock-Taussig shunt operation in which a central venous catheter was inserted through the left femoral vein to allow for the administration of parenteral therapy. The patient was extubated on the second postoperative day. Unfortunately, during the the catheter removal, it was discovered that its proximal part had broken off, and chest radiography revealed that the fragment was located in the left iliac vein (Figure 1).

We decided to remove the catheter fragment via the percutaneous approach. Intravenous cephazolin was given to our patient (50 mg/kg) as an antibiotic prophylaxis, and angiography was performed under deep sedation and fluoroscopic monitoring. A 5 French (5F) sheath was then placed percutaneously in the right jugular vein (RJV), and a 5F Judkins right (JR) catheter with a 0.018-inch guidewire was introduced into the RJV through the vena cava superior and the right atrium. Cineangiograms were then recorded. The distal part of the catheter fragment was seen in the inferior vena cava (IVC) above the iliac vein bifurcation, and the fragment was removed after being caught with a 4F Amplatz GooseNeck® Snare (Microvena Corp., White Bear Lake, Minnesota, USA). No complications were encountered during or after the procedure.

Figure 1. A view of the catheter fragment in the left iliac vein.

DISCUSSION

Central venous access (CVA) is an important therapeutic device for the administration of fluids, chemotherapeutic agents, and parenteral nutrition; however, it can cause complications such as catheter rupture, infection, arrhythmia, thrombosis, and embolisms[1] Fortunately, most of the associated complications can be avoided by a careful approach to implantation along with subsequent management.

Catheter rupture and embolization is a rare complication of CVA and requires surgical or interventional removal. It has a frequency rate of approximately 1% in adults, the incidence for the pediatric population has yet to be determined since there have been few published case reports.[1,4] Catheter fracture and embolization in asymptomatic patients can be diagnosed with the help of chest radiography. As our case was being dianosed, the proximal part of the catheter broke off during removal. However, the patient had no complaints. Even if catheter embolization is asymptomatic, its consequences can be serious, and it must be removed immediately.[1] Though the cause of catheter rupture is not well known, inappropriate placement, removal, or positioning can play a role.[1] Following the first interventional removal of an intravascular foreign body by Thomas et al.[5] in 1964, percutaneous removal has become the favored method. The nitinol gooseneck snare, first introduced in 1991, has become one of the standard methods of retrieval.[5] The Amplatz GooseNeck snares are preferred because of their safety and flexibility, and they provide the ability to easily grasp a foreign body. Furthermore, they are also beneficial for the removal of embolized devices and coils. However, a basket and forceps are sometimes still used.[1] The percutaneous retrieval of an intravascular foreign body is safer than for an intracardiac foreign body. The reported risk of perforation during cardiac catheterization is around 8%, and the right atrium and right ventricle have been found to be common sites for this occurrence.[6] The success rate of the percutaneous approach is 95%, and in one study, there were no reported complications in the retrieval of 100 embolized catheters.[1] The percutaneous procedure can be performed with a minimal risk of vessel wall damage and/or acute thrombosis.[6] Nevertheless, even though the percutaneous approach is safer than surgery, cases of hematoma and arrhythmia have been known to occur in adults.[1]

No complications were observed in our case. Surgical removal of intravascular and intracardiac foreign bodies entails the risk of anesthesia, a

thoracotomy, or even cardiopulmonary bypass; therefore, the cheaper, easier, and safer alternative of the percutaneous approach is preferable.

Declaration of conflicting interests

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REFERENCES

1. Tutar E, Aypar E, Atalay S, Yavuz G, Doğu F. Percutaneous transcatheter retrieval of intracardiac central venous catheter fragments in two infants using Amplatz Goose Neck snare. Turk J Pediatr 2009;51:519-23.
2. Surov A, Jordan K, Buerke M, Persing M, Wollschlaeger B, Behrmann C. Atypical pulmonary embolism of port catheter fragments in oncology patients. Support Care Cancer 2006;14:479-83.
3. Uçar B, Kiliç Z, Ayata M, Tokar B, Ilhan H. Percutaneous retrieval of an intracardiac catheter fragment using a snare-loop catheter. Anadolu Kardiyol Derg 2005;5:257.
4. Del Campo C, Ing VW, Millard OH, MacDonald J. Prospective evaluation of a totally implantable drug delivery system. Improved results at 4-year follow-up. Can J Surg 1991;34:278-81.
5. Thomas J, Sinclair-Smith B, Bloomfield D, Davachi A. Non-surgical retrieval of a broken segment of steel spring guide from the right atrium and inferior vena cava. Circulation 1964;30:106-8.
6. Marcy PY, Thariat J, Amoretti N. Percutaneous removal of embolized port catheter: The standard option. Catheter Cardiovasc Interv 2008;72:1025-6. doi: 10.1002/ccd.21778.