

Good and bad luck together: a cardiac tamponade case subsequent to internal jugular vein catheterization

Şans ve şanssızlık bir arada: İnternal juguler ven kateterizasyonu sonrasında ortaya çıkan kalp tamponadı olgusu

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Prior to serious surgical interventions, central venous catheterization (CVC) is used with such purposes as obtaining venous tract and hemodynamic monitorization as well as applying medicine. Although it is rare, serious complications might develop after catheterization. A 72-year-old female patient who was being prepared for coronary bypass surgery was inserted a CVC into right internal jugular vein. Her pericardium was opened upon the bradycardia that developed following the sternotomy, and it was observed that hemopericardium had developed. The tip of the central catheter was seen on vena cava superior and was pushed back by the surgery team. Cannulations were completed quickly and the pump was entered, vena cava was repaired and surgery was completed and then the patient was transferred to intensive care unit. In this article cardiac tamponade, which is a rare but potentially fatal complication associated with CVC, has been presented.

Key words: Cardiac tamponade; central venous catheterization/ complication; coronary bypass.

Central venous catheterization (CVC) is being increasingly used in various fields. While a central catheter is a safe way of mostly perioperative replacement of liquid, parenteral nutrition or administration of vasotoxic agents, it might present valuable hemodynamic knowledge too.^[1] Central venous catheterization is mostly done by using anatomic points that can be seen and palpated. The internal jugular vein, the subclavian vein and the femoral vein are the vessels mostly used for CVC. The internal jugular vein is one of the most popular insertion sites. The complications encountered in CVC applications are infection, air or thrombus embolism, hematoma pneu-

Santral venöz kateterizasyonu (SVK) büyük cerrahi girişimler öncesinde; venöz yol ve hemodinamik izlem sağlamak ve ilaç planlaması yapmak gibi amaçlarla uygulanmaktadır. Kateterizasyon sonrasında nadir de olsa ciddi komplikasyonlar gelişebilmektedir. Koroner bypass cerrahisi planlanarak ameliyata hazırlanan 72 yaşında kadın hastaya, sağ internal juguler venden SVK yapıldı. Sternotomiye takiben gelişen bradikardi üzerine acilen perikard açıldı ve hemoperikardiyum geliştiği gözlemlendi. Cerrahi ekip tarafından santral kateterin ucu vena cava superior üzerinde görüldü ve geri itildi. Kanülasyonlar hızla tamamlanarak pompaya girildi, vena cava tamiri ve cerrahi işlem tamamlanarak olgu yoğun bakıma nakledildi. Bu makalede SVK'nin nadir fakat potansiyel olarak ölümcül bir komplikasyonu olan kardiyak tamponad olgusu sunuldu.

Anahtar sözcükler: Kardiyak tamponad; santral venöz kateterizasyon/ komplikasyon; koroner bypass.

mothorax, hemothorax, chylothorax, cardiac tamponade, Horner syndrome, brachial plexus damage and dysrhythmia, and certain rare complications caused by a guide wire left or broken in the vein.^[2,3] Catheter infection or catheter and vein thrombosis are among the late manifesting complications stemming from the catheterization procedure.^[4] Cardiac tamponade subsequent to CVC is a rare, but potentially mortal complication.

In this case report, we present a cardiac tamponade case that arose as a serious complication following a right internal jugular vein catheterization on a patient being prepared for operation.

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CASE REPORT

The 72-year-old female patient was taken to the operating theatre to be given ternary coronary bypass surgery. The patient who was diagnosed with higher blood pressure, hypothyroidism, hyperlipidemia and chronic atrial fibrillation was receiving medical treatment for these additional ailments. The preoperative thyroid function tests of the patient who was taking levothyroxine were within the normal limits. Five milligram midazolam was administered intramuscularly as the premedication 45 minutes before the operation.

After the patient was taken to the operating theatre, electrocardiography (ECG), the measurement of peripheral oxygen saturation and invasive artery monitoring were performed. The arterial blood pressure (ABP) was 150/100 mmHg, the heart rate (HR) was 156 beat/min, and atrial fibrillation with high ventricular rate was present. Anaesthesia was induced with 4 mg/kg sodium thiopental, 2.5 µg/kg fentanyl and 0.1 mg/kg vecuronium bromide. In maintaining the anaesthesia, 1.5-2% sevofluran combination in 50/50% oxygen/air and 7 µg/kg/h fentanyl infusion was applied and additional vecuronium bromide doses were used as muscle relaxants. The right internal jugular vein was chosen as the site for the CVC.

In order to minimize any risk of embolus formation and to fill the jugular vein, the patient was placed in the Trendelenburg position. The infusion area on the skin was sterilized, covered and prepared. Blood was aspirated with a 18 G needle through venous puncture. When free blood flow was obtained, a 3 mm diameter pliable J guide wire was pushed forward. The syringe was pulled back, the catheter was located following the dilatation and then the guide wire was pulled back. No difficulty was experienced while pushing forward the catheter and the J guide wire. A 16 cm catheter with 7F double lumen was used (Arrow® Deutschland GmbH, Erding, Germany). Aspirating blood from each of the lumens, liquid application sets were fixed. Immediately after the sternotomy, the HR was measured as 40 beat/min and the ABP as 50/40 mmHg.

Upon the continuation of serious bradycardia despite ephedrine and atropine boluses, the pericardium was immediately opened where hemopericardium was observed. The tip of the central catheter was seen to be on the vena cava superior and was withdrawn. Upon this, the HR and the ABP of the patient returned to normal and became stable.

Cannulations were completed quickly and the pump was started. A cross-clamp was inserted into the aorta while the saphenous vein graft was being prepared. Antegrade and retrograde cardioplegia were admin-

istered. The patient was infused with propofol while on the pump. When the pump was stable, the distal anastomoses were completed. The cross clamp was removed and the heart was started through defibrillation. The proximal anastomoses were administered after the clamp was removed. The vena cava superior was repaired, and the patient was decannulated. She was administered protamine and admitted to the coronary intensive care unit to be observed on a mechanical ventilator. The patient was extubated after 12 hours and her observation continued in the intensive care unit. When no complications were observed on the sixth day following the operation, the patient was discharged.

DISCUSSION

Cardiac tamponade, which arises as a complication of CVC, is generally a life-threatening condition and has a high mortality rate around 65-78%.^[5,6] Its primary etiology is the misplacement of the catheter. The direct perforation caused by the tip of the cannula, the hypertonic solutions used and the high pressure infusions might cause perforations.^[7-10]

The location of the tip of the catheter might also contribute to the perforation. A number of authors put the emphasis on three suitable locations for the tip of the catheter; namely the superior vena cava, the superior vena cava-right atrium joint and the right atrium.^[8,11] Perforations most often occur in right atrium and all the cases with perforation of the right atrium prove fatal in the course of the disease. Even though the catheter is inserted correctly, such factors as the movement of the head and the neck, breathing, and even the normal heart cycle might cause the tip of the catheter to relocate. The heart tamponade symptoms associated with a central venous catheter are rather diverse; e.g. a sudden cyanosis, severe hypotension, bradycardia, tachycardia, distension in neck veins, increased central venous pressure, narrowed pulse pressure, paradoxical pulse, metabolic acidemia and breathing difficulty.^[7,8,11-13]

If these complications are suspected through radiologic testing, arterial blood gas analysis, transesophageal echocardiography or any other diagnostic process, the infusion should be ended without delay and aspiration of liquid should be tried from the pericardial gap.^[6,8,10,12] Since there is a likelihood of such adverse conditions in every patient inserted a central venous catheterization, the surgeon should be knowledgeable about preventing, diagnosing and managing the condition.

The cardiac tamponade, which is a rare complication associated with central venous catheterization, is a complication with a high mortality rate. Its diagnosis is very important and life-saving. Major operations require a CVC. The fact that our patient needed cardiac surgery,

but no other major surgery, increased the chance of survival owing to the early diagnosis of the cardiac tamponade associated with the jugular vein catheterization and the successful intervention to it.

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