

Pericardial effusion and cardiac tamponade: a sudden and unexpected deterioration in a newborn in the neonatal intensive care unit

Perikardiyal efüzyon ve kardiyak Tamponad:

Yenidoğan yoğun bakım ünitesinde yatan bebekte ani beklenmedik bozulma

Selma Aktaş,¹ Mehmet Gümüştaş,² Esra Önal,¹ Serdar Kula,² Deniz Aslan³

Departments of Children Health and Diseases, ¹Division of Neonatology, ²Division of Pediatric Cardiology, ³Division of Pediatric Hematology, Medical Faculty of Gazi University, Ankara, Turkey

Peripherally inserted central venous catheters (PICCs) are widely used in neonates who need prolonged venous route for total parenteral nutrition and prolonged therapy. Although the PICC line is the safest way for venous access in neonatal intensive care units, there are common adverse events such as infection, occlusion, migration, and thrombosis.^[1] Life-threatening complications such as extravasation of the fluid into the tissue spaces, cardiac arrhythmia, and endocarditis have been also reported.^[2] Among these, the most life-threatening complication is pericardial effusion (PCE) with cardiac tamponade. These uncommon complications usually result from the incorrect position of the catheter.^[3,4] Although it can develop any time following the catheter insertion, the median duration is three days.^[5] Extremely unusual complication of catheter is the formation of an intra-cardiac thrombus.^[6]

Herein, we present a 53-day-old male infant with a gestational age of 28 weeks with a birth weight of 670 grams who was born by C-section delivery. A 28-gauge polyurethane (PremiCath) central venous catheter was inserted into his right arm on Day 47 due to nosocomial sepsis and necrotizing enterocolitis. At the sixth day of the treatment, his overall condition deteriorated abruptly. His blood pressure decreased and he did not respond inotropic agents and volume load. The infant had tachypnea, tachycardia, and an increased need for oxygen and ventilation support. Plain radiography showed that the shadow of the heart was wide and the tip of the catheter was in the right ventricle (Figure 1). Following confirmation of the suspicion of PCE with cardiac tamponade

by echocardiography, percutaneous subxiphoid pericardiocentesis was immediately performed using a 22-gauge needle and 51 mL fluid, which was compatible with total parenteral nutrition solution, was drained (Figure 2a). The catheter was removed and the oxygen and inotropic requirement, then, decreased significantly. Echocardiography performed on the following day demonstrated no PCE, but a thrombus formation in the right ventricle. After pericardiocentesis and removing the catheter, PCE and cardiac tamponade did not recur. Thrombus

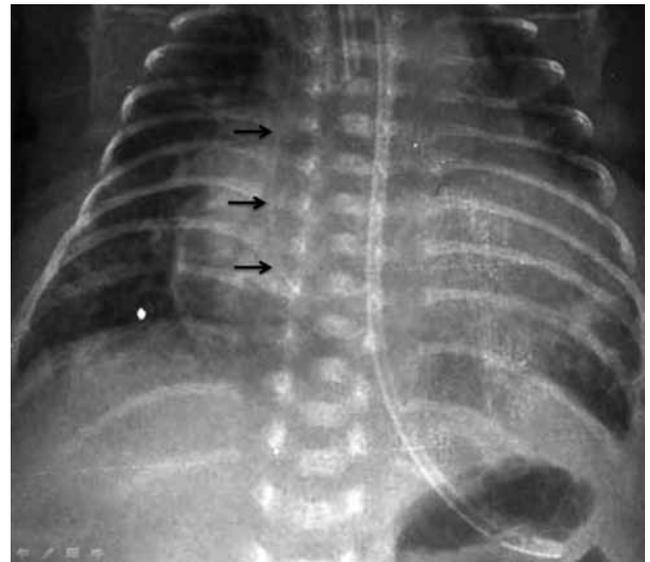


Figure 1. The tip of the line was in the right ventricle and the shadow of the heart was wide.



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Correspondence: Selma Aktaş, MD. Gazi Üniversitesi Tıp Fakültesi Çocuk Sağlığı ve Hastalıkları Anabilim Dalı, Neonatoloji Bilim Dalı, 06500 Beşevler, Ankara, Turkey.
Tel: +90 505 - 725 13 84 e-mail: selmaktas@gmail.com

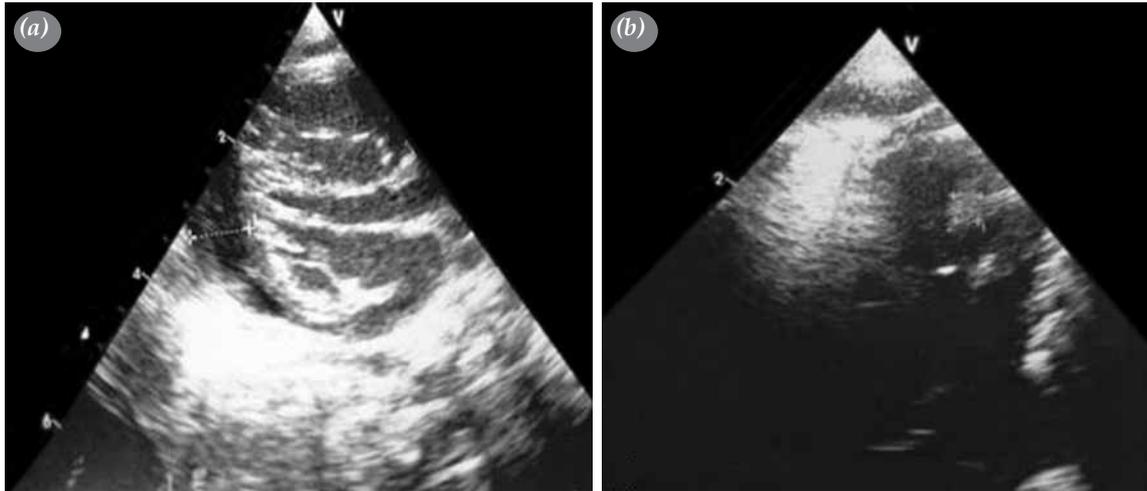


Figure 2. (a) Pericardial effusion was demonstrated by echocardiography and pericardiocentesis was performed simultaneously. (b) Following pericardiocentesis, a thrombus formation was noticed in the right ventricle.

formation (4.11x2.71 mm) in the right ventricle (Figure 2b) was treated with low-molecular weight heparin (1.5 mg/kg/day) for two weeks and the right ventricular thrombus resolved. The infant was discharged from the hospital without any sequelae associated with this complication.

Catheter associated PCE and cardiac tamponade is seen 1 to 3% of neonates.^[7,8] About 30 to 50% result in death.^[6] The only preventive attempt is to insert the line exact position. However, we should check the position on a regular basis, as it may move on over time. The common incorrect position of the tip of the catheter is the right atrium and the thrombus is usually formed in this location.^[9] Interestingly, in our case, the tip of the catheter and the thrombus formation was in the right ventricle.

The aim of this case report is to emphasize that if sudden cardiovascular collapse occurs in an infant with a peripherally inserted central venous catheter, the possibility of catheter complications, particularly cardiac tamponade, should be primarily considered. Our experience shows that early diagnosis of cardiac tamponade and timely pericardiocentesis can be life-saving in most of the cases.

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