CASE REPORT

An Unusual Cause of Asystole: Insertion of a Central Venous Catheter

Harun Gunes1, Elif Nisa Unlu2, Ozlem Suzer3, Abdullah Ibrahim3, Ahmet Afacan3, Ayhan Saritas1 and Hayati Kandis1

ABSTRACT

Central venous catheters are a commonly used medical device which may sometimes cause complications. We present first case who had an asystolic cardiac arrest during insertion of a central venous catheter, needed cardiopulmonary resuscitation (CPR), and was resuscitated successfully. A 46-year lady presented to the emergency department due to mushroom poisoning. A central venous catheter was inserted through the internal jugular vein. However, the patient suddenly lost consciousness and asystole was seen on the monitor immediately after the insertion of the catheter. Cardiopulmonary resuscitation was started, and the catheter was withdrawn nearly 5 cm. Spontaneous circulation returned 2 minutes later. The patient was hospitalised, hemodialysis was performed, and she was discharged the next day. Emergency physicians should be prepared for dysrhythmias and asystole during insertion of a central venous catheter. If cardiac arrest develops, the catheter should be withdrawn a few centimeters while CPR continues.

Key Words: Asystole. Cardiac arrest. Central venous catheter. Cardiopulmonary resuscitation.

INTRODUCTION

Central venous catheters (CVC) are commonly used for hemodynamic monitoring, hemodialysis, administration of medicines, and placing temporary trans-venous pacemakers. Although CVCs are useful, they may sometimes cause infections, mechanical and thromboembolic complications. Mechanical complications are the most important ones, because they usually lead to suddenly occurring effects like dysrhythmia, air embolism, pneumothorax and cardiac tamponade.1,2 Sinus arrest and asystole may also develop related to CVCs.3 However, the authors could not find any report of an asystolic cardiac arrest event during insertion of a CVC, needing cardiopulmonary resuscitation (CPR).

The authors present this case to emphasise that asystolic cardiac arrest may very rarely be seen during insertion of a CVC.

CASE REPORT

A 46-year lady presented to the emergency department complaining of nausea and vomiting approximately one hour after mushroom intake. She was conscious and cooperative, but seemed moderately ill. Her past medical history was unremarkable. Her vital signs were in the normal ranges. No significant findings were found on physical examination, and her electrocardiogram was normal. The results of her laboratory tests were also normal except slightly elevated levels of lactate and direct bilirubin [3.2 mmol/L (normal 0.5 - 1.6) and 0.5 mg/dL (normal 0 - 0.2), respectively]. The Internal Medicine Department was consulted for hemodialysis. A CVC was inserted through the right internal jugular vein to prepare the patient for hemodialysis. However, the patient suddenly lost consciousness, and asystole was seen on the monitor immediately after the insertion of the catheter. Because there was no palpable arterial pulse, CPR was started. While CPR was being continued, the catheter was withdrawn nearly 5 cm, and return of the spontaneous circulation (ROSC) was observed after two minutes of CPR. Chest X-ray was taken after achieving ROSC; the catheter tip was seen to be in the superior vena cava, a few centimeters above the level of superior cavoatrial junction. The patient was hospitalized by the Internal Medicine Department, and hemodialysis was performed. She was discharged the next day after the results of her laboratory tests were normalised.

DISCUSSION

CVCs are widely used by emergency physicians for cardiac monitoring, delivery of some medications, and volume resuscitation with blood products or isotonic fluids. They are also used for hemodialysis, which is also known to be helpful in the treatment of mushroom poisoning.4,5 However, some serious complications including hematoma formation, pneumothorax, infection, air embolism, venous clot formation, and non-sustained cardiac dysrhythmia may develop related to CVCs.1 Although it is quite rare, asystole may also develop related to insertion of a CVC.2,3 Asystole and cardiac arrest seen in this patient was thought to be related to
CVC mainly due to three reasons. The first one is the close temporal association between the two events. The second one is the patient's past medical history which did not have any feature that might explain a sudden asystole, and finally, achievement of ROSC in two minutes after the CVC was withdrawn approximately 5 cm. Sinus arrest and asystole may be caused by vagal stimulation or direct stimulation of the sinoatrial (SA) node by a guide wire or by the catheter itself. Vagal stimulation usually leads to sinus deceleration which is almost always accompanied by PR prolongation and atrioventricular block. However, a sinus arrest or an asystole developing in isolation, as it occurred in our patient, suggests direct irritation of the SA node. A CVC is not expected to cause an asystole unless the guidewire or the catheter itself is not advanced into the cardiac chambers, which is normally not needed during the insertion of a CVC. The guidewire or the catheter should not be advanced more than 18 cm, the upper limit of safe guidewire insertion in an adult patient, to avoid complications.

There are two reported cases having asystole which might be related to CVCs. One of the CVC related asystole cases faced episodes of sinus arrest and short living asystole attacks starting nearly 10 days after insertion of a CVC but did not develop a cardiac arrest, and did not need CPR. The other one occurred during the insertion of a CVC but the asystole developed “immediately after the vein was cannulated and before the guidewire was placed”. So it is more reasonable to suggest that occurrence of asystole during the insertion of CVC in that patient was just by chance. The current patient seems to be the first one having an asystolic cardiac arrest during insertion of a CVC.

REFERENCES