Negative results - Cardiac general

Fracture and cardiac migration of an implanted venous catheter

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Received 29 May 2003; received in revised form 3 July 2003; accepted 7 July 2003

Abstract

Objective: Distal embolization of a fractured indwelling central catheter is a rare life-threatening complication. Interventional radiologic techniques are often successfully used to retrieve the fractured tip but in rare cases, a surgical intervention is needed. Methods: We present a case in which radiologic methods failed to remove the embolized fragment because of multiple venous occlusions, and a cardiotomy was finally necessary. Results: After right atriotomy, the fractured embolized tip was successfully removed, as well as the proximal portion. Conclusions: Implanted catheters should be removed after completion of treatment, or the integrity of the system should be monitored on a regular basis.

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Keywords: Catheter fracture; Embolization; Port-a-cath; Venous access device

1. Introduction

Indwelling vascular access devices (VADs) are frequently used in patients who require long-term courses of intravenous infusions such as chemotherapy or total parenteral nutrition. The most frequent complications of these devices include pneumothorax, infection, and deep neck or thoracic vein thrombosis [1]. Distal embolization of a fractured indwelling catheter is a rare complication that may be life threatening.

We present a case of VAD fracture in a patient who presented with palpitation and dysrhythmia secondary to cardiac migration of the embolized fragment.

2. Case

A 32-year-old female presented to the emergency department, McLeod Regional Medical Center, complaining of 2 days of intermittent palpitations, lasting from a few seconds to few minutes. These episodes were associated with dizziness, shortness of breath, lightheadedness, and blurry vision. She denied any chest pain, nausea, or sweating.

Patient denied also use of medications, herbal supplements, tobacco, alcohol, or illicit drugs. In the past, she had undergone total abdominal hysterectomy and oopherectomy for recurrent malignant germ cell tumor of the ovary. Eight months prior to her presentation, a port-a-cath had been placed in her right subclavian vein for administration of chemotherapy. Patient had completed therapy 5 months prior to her presentation and had not manifested any signs or symptoms of recurrence since then.

Physical exam revealed a moderately obese, well-hydrated female in no acute distress. She had a blood pressure of 136/72 mm/Hg, pulse of 102 beats/min, respirations of 16 breaths/min, temperature of 36.8 °C, and pulse oximetry of 100% on room air.

There was no jugular venous distention and the chest was clear. Cardiac auscultation revealed a normal S1 and S2 and a regular rate with frequent ectopy. No murmurs, gallops, or rubs existed. The pulse exam revealed a regular rhythm with frequent episodes of fast and irregular beats. The implanted venous access device was present in the right upper pectoral region. The overlying skin was non-tender and non-erythematous.

Electrocardiogram revealed normal sinus rhythm with sinus arrhythmia and frequent premature ventricular
contractions. A portable chest radiograph showed normal lung fields and a port-a-cath in place with the catheter fragment fractured and the tip of the catheter in the right atrium (Fig. 1). Interestingly, transthoracic echocardiogram did not show any evidence of foreign body in the heart.

Interventional Radiology attempted to retrieve the fragment through right retrograde femoral catheterization. This was unsuccessful, because of the vein occlusion. Further exploration revealed that left femoral as well as right and left internal jugular veins were also occluded. Ultrasound showed that the right subclavian vein was occluded around the remaining proximal portion of port-a-cath and that the left subclavian vein was too small for access. the Patient was then referred to cardiothoracic surgery. Under general anesthesia, a median sternotomy was made and using a Satinsky clamp, the catheter was trapped. The clamp opened making the right atriotomy and removing the distal fragment of the catheter. The proximal fragment was then removed from the subclavian area and the incisions were closed. The heart was not arrested and extracorporeal circulation was not necessary. Postoperative course was without complications and patient remained free of palpitations or arrhythmias until discharge home.

3. Discussion

Intravenous catheter fracture and embolization has been discussed in the literature since the early 1950s [2]. Most of the cases before the mid-1970s involved peripherally inserted lines and iatrogenic cutting of the needle at the time of insertion [3]. Fracture of a centrally implanted venous catheter is a very rare complication with an estimated prevalence of 0.2–1% [4]. Fracture may happen at the time of insertion or any time after. In 1984, Aitken et al. proposed that ‘pinching’ of the catheter between clavicle and first rib over time could lead to late fracture and embolization of the distal segment into heart and great vessels [5].

Surprisingly, clinical presentation of this late complication may be subtle. In fact, only a minority of patients with catheter embolus present with significant symptoms including chest pain, palpitation, dysrhythmias, and unstable vital signs [3]. In this case, the patient presented with palpitation and dysrhythmia with no other cardiac symptoms. EKG and chest X-ray are essential for the patients with VADs who present with cardiopulmonary symptoms. The key to the diagnosis remains chest radiograph.

In 1990, Hinke et al. described 11 cases of pinch-off syndrome and tried to grade its severity by radiographs [6]. They recommended prompt removal of catheters from patients with radiographic evidence of catheter compression. Once catheter embolus is diagnosed, it should be removed immediately by less invasive methods, i.e., transcutaneous retrieval preferably through a femoral vein approach. As in this case, failure of interventional radiologic techniques may rarely necessitate thoracotomy and cardiomyotomy to remove the fractured segment. We conclude that all implanted catheters should be removed after completion of treatment, or the integrity of the system should be monitored on a regular basis.

References


Fig. 1. Port-a-cath in place with its fractured tip in the right atrium.