

An unusual cause of ventricular tachycardia: Port-A-Cath fracture and embolization into the pulmonary artery

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ABSTRACT

We describe the case of a patient with a previously placed Port-A-Cath who was admitted to hospital for new onset of non-flushing catheter and palpitations with ventricular tachycardia. A chest X-ray and a linogram showed a Port-A-Cath fracture and distal embolization into the right ventricle resulting in ventricular tachycardia. The catheter was removed percutaneously using a Goose Neck snare with no complications and resolution of the ventricular tachycardia. The removed segment demonstrated thrombus. Prompt removal of the embolized catheter fragments should be undertaken given the subtle nature of the embolization and the potential complications.

Keywords: Port-a-cath fracture, Ventricular tachycardia, Percutaneous retrieval.

Introduction

Totally subcutaneous intravascular portals (Port-A-Cath) are frequently used to administer chemotherapeutic agents. We present a case of Port-A-Cath fracture with distal embolization causing non-sustained ventricular tachycardia and its percutaneous retrieval.

Case Report

A 68-year old male with diabetes, hypertension and dyslipidemia controlled by medication and metastatic colon cancer to the liver was admitted to hospital for a non-flushing Port-A-Cath which had been inserted six years earlier to receive chemotherapy. Upon questioning, the patient reported new onset palpitations not associated with loss of consciousness. His physical examination revealed blood pressure 142/64, pulse 64, body temperature 37°C, and an arterial oxygen saturation of 98%. His physical examination revealed no murmurs, gallops or rubs. His jugular veins were

not distended. The remainder of the examination showed no problems.

Diagnostic linogram was performed. This demonstrated a catheter fracture at the first rib with extravasation of contrast at the site of insertion with the distal catheter fragment traversing the right atrium and the right ventricle with the tip within the right ventricular apex (Fig. 1).

Injection of contrast into the Port-A-Cath caused left shoulder pain. During hospitalization, the patient had been complaining of palpitations. Cardiac telemetry demonstrated non-sustained runs of both supraventricular as well as ventricular tachycardia (Fig. 2) as the catheter embolism migrated through his heart.

Given the ventricular arrhythmia, a decision was made to retrieve the catheter fragment. The patient was transferred to our catheterization laboratory where repeat fluoroscopy showed the distal catheter had embolized further into the left main pulmonary artery (Fig. 3A) with subsequent resolution of ventricular ectopy.

A right femoral vein approach was used and a 6 Fr multipurpose catheter was placed into the pulmonary artery via a 7fr femoral introducer sheath. Through this, a 0.014-180 cm Grand Slam coronary wire (Abbott Vascular, Abbot Park, IL, USA) with a cinch was advanced and the multipurpose catheter removed. The Port-A-Cath embolus was snared with a 25 mm 6 Fr. Amplatz GooseNeck Snare Kit (Covidien, Plymouth, MN, USA) and withdrawn out of the pulmonary artery, into the right ventricle, then the inferior vena cava, and removed through the femoral sheath (Fig. 3C). The catheter fragment was found to have thrombus within its lumen (Fig. 3D).

A follow-up echocardiogram demonstrated no evidence of pulmonary hemorrhage or cardiac trauma. Subsequently the patient had surgical removal of the remaining catheter segment.

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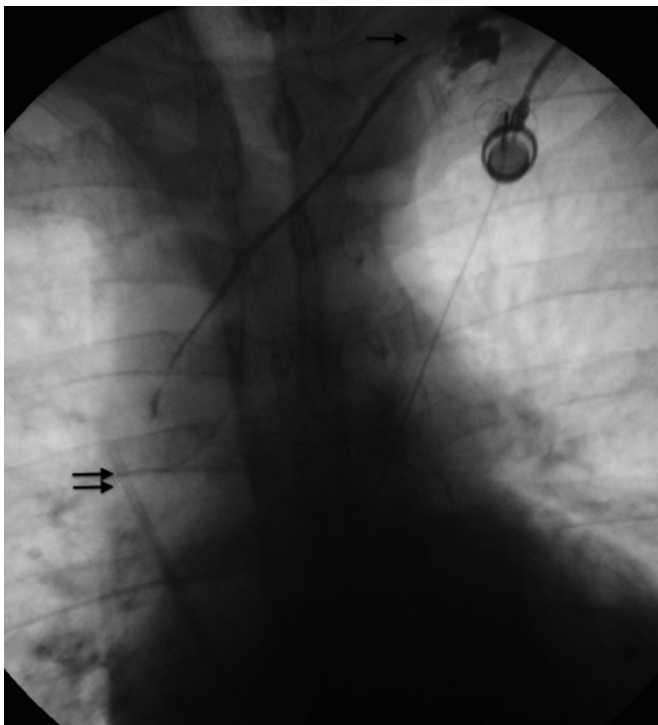


Fig. 1 - A linogram demonstrating catheter fracture at the medial border of the first rib with extravasation of contrast material (single arrow). Contrast extends in the location of the innominate vein. The proximal portion of the catheter is located in the right atrium crossing into the right ventricle (double arrow).

Discussion

Port-A-Caths are widely used in the field of oncology. Catheter fracture and embolization is one of the rare complications of subclavian central venous catheters. A case series of 333 Port-A-Cath insertions showed that catheter fractures and distal embolization occurred in 5 cases (1.5%) (1). Aitkins et al. described a possible mechanism for subclavian Port-A-Cath fracture where compression between the clavicle and the first rib causes catheter fracture (2). They describe the pinch off sign where the caliber of the catheter narrows as it passes over the first rib.

The most common presentation of catheter embolization is asymptomatic discovery on chest radiology, with other presentations including infra/supraclavicular swelling (3). To our knowledge, there has been only one previous description of ventricular tachycardia caused by Port-A-Cath fracture and embolization (3). In that case, there was an increase in ectopy when the patient changed position. In our case, the patient had an unusual presentation of palpitations and ventricular tachycardia, but given his malfunctioning Port-A-Cath, further imaging allowed the cause of the arrhythmia to be diagnosed.

Prompt removal of catheter fragments is preferred due to potential complications including pulmonary thromboembolism, cardiac perforation, cardiac arrest and endocarditis (4). A previous case series of 20 patients with asymptomatic



Fig. 2 - Non-sustained ventricular tachycardia while catheter embolus was located in the right ventricle. The morphology changes as the catheter embolus moves through the right heart.

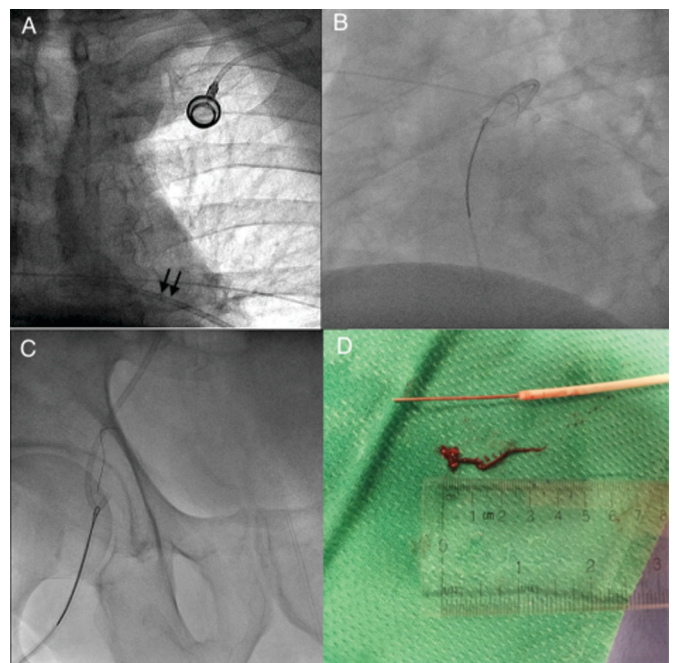


Fig. 3 - Subsequent cardiac catheterization demonstrating the catheter had migrated into the left pulmonary artery (A). A Goose-Neck snare was placed over the distal end of the catheter embolus (B) and maneuvered through the right ventricle, inferior vena cava and femoral vein (C) where it was extracted. Examination of the removed catheter revealed thrombus (D).

catheter embolization and per cutaneous retrieval demonstrated successful retrieval in all cases: 16 with a snare and 4 using a basket retrieval system (5). Interestingly, 2 cases had



thrombus formation in the distal catheter similar to our case. No major complications were noted.

Conclusions

In summary, Port-A-Cath fracture and distal embolization has been described in the literature. Our case describes a rare yet potentially catastrophic complication of catheter embolization, i.e. symptomatic cardiac arrhythmia and in situ thrombosis with a catheter fragment in the pulmonary artery. Given the subtle nature of the embolization and the potential complications, clinicians should be vigilant for catheter fracture and embolization. Percutaneous removal has been shown to be a safe procedure, allowing for prompt removal of the embolized catheter fragments.

Disclosures

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Conflict of interests: The authors declare no potential conflict of interests.

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