Case study

Migration of an implantable port catheter into the right pulmonary artery: a rare complication in a child followed for testicular rhabdomyosarcoma.

Abstract:

Introduction: The implantable catheter chamber (ICC) is today a crucial tool in the management of cancer patients receiving chemotherapy. As an invasive device, it carries risks that can be infectious, mechanical, and thromboembolic.

Case presentation: We report a case of a young child with this rare but potentially serious migration. To receive his chemotherapy treatment, our patient benefited from the placement of an ICC at the subclavian vein via a percutaneous technique. The patient was asymptomatic, and the migration was discovered on the chest X-ray performed for the ablation. The transthoracic echocardiography performed on March 29, 2023, found the catheter in the right pulmonary artery.

The removal of the migrated catheter was successfully performed by percutaneous endovascular catheterization techniques under mild sedation.

Conclusion: The rupture and migration of the catheter of the implantable chamber at the level of the pulmonary artery, remains rare, the endovascular catheterization is an option of ablation.

Keys words: Child, Implantable port catheter, Migration, Rhabdomyosarcoma, Right pulmonary artery.

Objective: The interest here is to highlight this rare complication observed in cancer patients and the role of interventional cardiology in the management of such a complication.

Introduction

The implantable catheter chamber is one of the instruments used in the management of cancer patients. It provides the long-term venous access necessary for chemotherapy. However, this medical device involves significant risks both during its installation and during its use. One of its rare complications is represented by the rupture of the catheter and/or its migration of the distal fragment into the pulmonary arteries. Other complications are infectious, mechanical, or thromboembolic.

Interventional cardiology is an effective therapeutic option to retrieve the embolized fragment.

Case presentation

We report the case of an 11-year-old patient, followed for a rhabdomyosarcoma of the left testicle that required the placement of an implantable chamber. This device, placed by percutaneous puncture of the right subclavian vein, allows the administration of chemotherapy drugs. In January 2023, four years after the last chemotherapy session, it was decided to remove the chamber. A chest X-ray was performed, revealing the rupture and migration of the catheter, which had wrapped around the pulmonary arteries (Figure 1). A transthoracic echocardiogram performed on March 29, 2023, found the catheter tips in the pulmonary artery, one at the bifurcation and the other in the right pulmonary artery (Figure 2).

Ablation was performed uneventfully by endovascular catheterization via the femoral approach in interventional cardiology, showing the catheter coiled in the pulmonary artery (Figure 3). The piece after extraction measured 17cm.

Discussion:

Since the invention of princeps in 1657 by Sir Christopher Wren, the implantable catheter chamber has revolutionized the management and quality of life of cancer patients [1].

Embolization of a fragment of an implantable catheter can be a source of significant morbidity, such as arrhythmia, cardiac arrest, pulmonary embolism with hemoptysis, perforation, tamponade, thrombosis, or infection [1-2]. A rare complication is rupture and embolization by distal fragments of the catheters, which occurs in 0.9-1.7% [3-4 ,5]. The mechanism of rupture may be either costo-clavicular pinching (pinch-off syndrome), or inappropriate use of the material, or disconnection of the chamber, or traumatic sectioning during insertion or extraction. The latter mechanism seems to be the most plausible in our young patient [1, 3, 4].

Clinical presentation is generally inexpressive, as in the case of our patient, who was asymptomatic. This asymptomatic or pauci-symptomatic character had already been reported by Biffi et al [6]. in a series of 178 cases of implantable chambers of which 3 cases of rupture, one was asymptomatic and the other two presented palpitations and thoracic discomfort [1]. Cases of ventricular tachycardia secondary to rupture and embolization of the implantable chamber catheter have been reported [7].
The routine chest x-ray is often the mode of revelation and allows the appearance to be classified into the different grades of Hinke et al : grade 0 evokes a normal path and harmonious curvature, grade 1 indicates angulation without luminal narrowing, grade 2 indicates narrowing of the catheter lumen, and finally grade 3 defining a complete or partial rupture of the catheter [3]. Echocardiography can be of great help in locating and orienting catheter extraction [8].

Migration and embolization of the distal fragment(s) most often occurs in the hepatic vein, brachiocephalic vein, superior vena cava, right atrium or ventricle, coronary sinus, and pulmonary arteries [4,8]. The migrated fragments have a mean length of 11.6cm in the series of 41 cases reported by Surov et al. in contrast to our case in which the fragment migrated into the pulmonary artery is quite long [4]. Fragments migrating into the pulmonary arteries are also shorter than those migrating into the veins and heart chambers [4].

Interventional cardiology has become the method of choice for retrieving migrated fragments from the implantable chamber catheter. This method is simple without many risks with a significant success rate as in our patient. Cheng et al reported a successful recovery rate of 97.8% in a series of 92 cancer patients with the device [1].

Conclusion

Rupture and embolization of the implantable chamber catheter in the right pulmonary artery is a rare complication. Here we report the case of asymptomatic migration in a child treated for left testicular rhabdomyosarcoma in whom extraction by endovascular catheterization was successful.

- Ethics approval: Not applicable

- Consent: The patient's parents have given written informed consent for the publication of this case and accompanying images. A copy of the written consent is available for review by the editor of this journal upon request.

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Figures Legends:

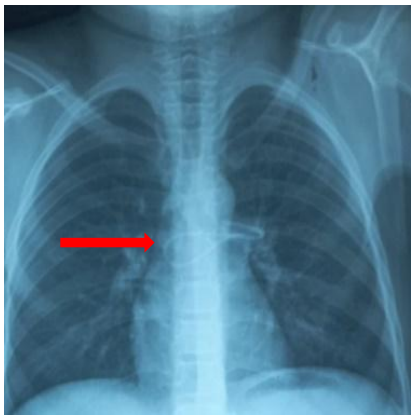

Figure 1: chest x-ray showing the migrated catheter coiled in the pulmonary artery.

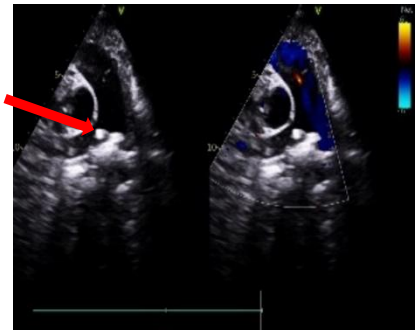

Figure 2: Echocardiography showing the tip of the catheter migrated to the level of the right pulmonary artery.

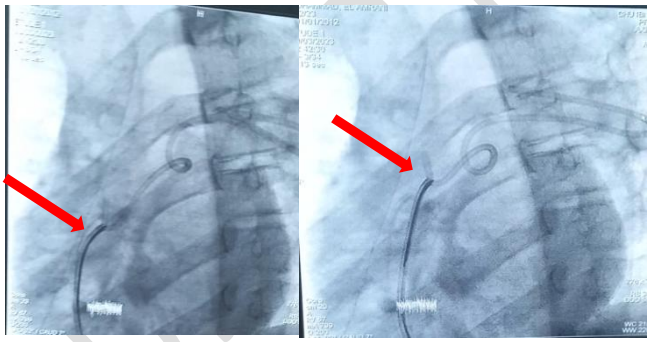

Figure 3: recovery maneuver by endovascular route under fluoroscopy.