

Case report

An affordable approach for the extraction of migrated foreign devices into pulmonary arteries

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Abstract

Percutaneous embolization of the hypogastric and gonadal veins represents an effective treatment of pelvic venous congestion syndrome. In rare cases, coil migration may occur. We are presenting the case of a 57-year-old female patient diagnosed in 2013 with pelvic congestion syndrome, treated by a transcatheter coil embolization technique of the gonadal and hypogastric veins. During the procedure, one coil migrated to the right inferior pulmonary lobe artery leading to localized thromboembolism. Four years after the intervention, the patient addressed our Cardiology Department for an attempt of coil extraction. A minimally invasive percutaneous endovascular technique through the right subclavian vein was performed. The reason for the few cases reported regarding the percutaneous extraction and the limited experience in this field is assumed to be due to the absence of clinical expression induced by the migrated coils, most patients being asymptomatic. The management of coil migration in asymptomatic cases is a controversial issue. In the presented case, our patient had two thrombotic events induced by the migrated coil. So, a percutaneous attempt was performed for its extraction since our patient needed long-term oral anticoagulation therapy. The procedure didn't succeed but showed the fact that percutaneous extraction of pulmonary artery migrated coil could be feasible in those symptomatic cases with recent occurred migration using affordable devices.

Keywords: *pelvic congestion syndrome; migrated coil; thromboembolism; percutaneous endovascular minimally invasive technique*

Introduction

The "pelvic congestion syndrome" characterized by Louis Alfred Richet in 1857 is a chronic, gnawing pelvic pain or pressure that lasts for more than 6 months with no evident cause [1]. The first case of transcatheter embolization was communicated by Edwards, et al [2]. The embolization can be done using different agents such as coils, sclerosants or

glue [1]. Although percutaneous embolization of the hypogastric and gonadal veins could be an alternative approach for pelvic venous congestion syndrome, in rare cases, complications such as coil migration may occur [1]. Until now, only few incidents of device migration have been reported in the literature and generally without significant consequences [3-5].

Case report

We present the case of a 57-year-old female patient diagnosed in 2013 with pelvic congestion syndrome and treated by transcatheter coil embolization technique of

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the gonadal and hypogastric veins. During the procedure, one coil migrated to the right inferior lobe pulmonary artery (RILPA), leading to localized thromboembolism. The clinical evolution was favorable after systemic thrombolysis followed by two months of oral anticoagulant treatment. Shortly after the oral anticoagulant treatment was discontinued, the patient suffered a recurrence of pulmonary embolism within the same topography treated also by thrombolysis and followed by chronic anticoagulation therapy.

In 2017, the patient was admitted to our Cardiology Department in order to attempt the extraction of the migrated coil. On admission, the patient was asymptomatic with only minimal signs of lower limbs venous insufficiency.

The electrocardiogram showed sinus rhythm with normal morphology. The echocardiographic features were normal. On the chest X-ray the migrated metallic coil was observed on the right pulmonary hilum topography (Figures 1a, 1b) with RILPA positioning confirmed by the chest CT angiography and the coils on the hypogastric and gonadal veins (Figure 1c). To attempt the extraction of the metallic coil, a percutaneous endovascular minimally invasive technique through the right subclavian vein was performed. Additionally, two foreign body extraction devices were used: a cardiology-specific Amplatz goose neck snare and a gastroenterology-specific Rescue Combo-Rat Tooth/Alligator Grasping Forceps.

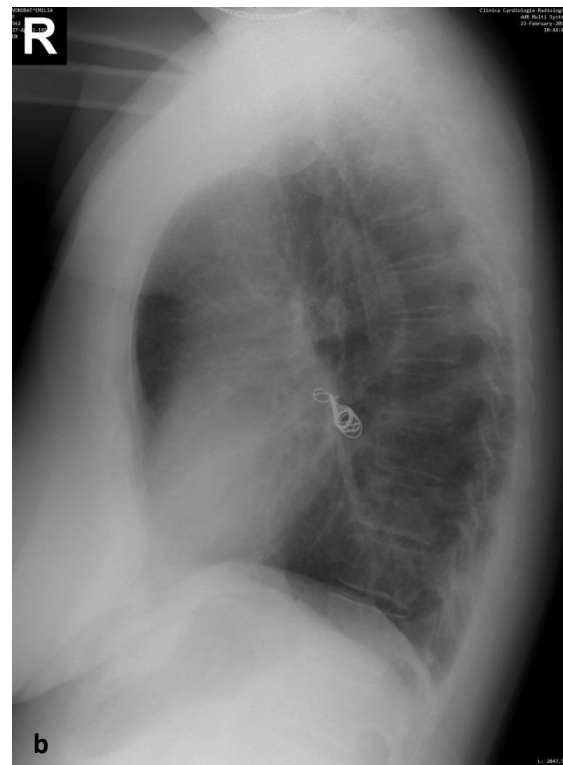
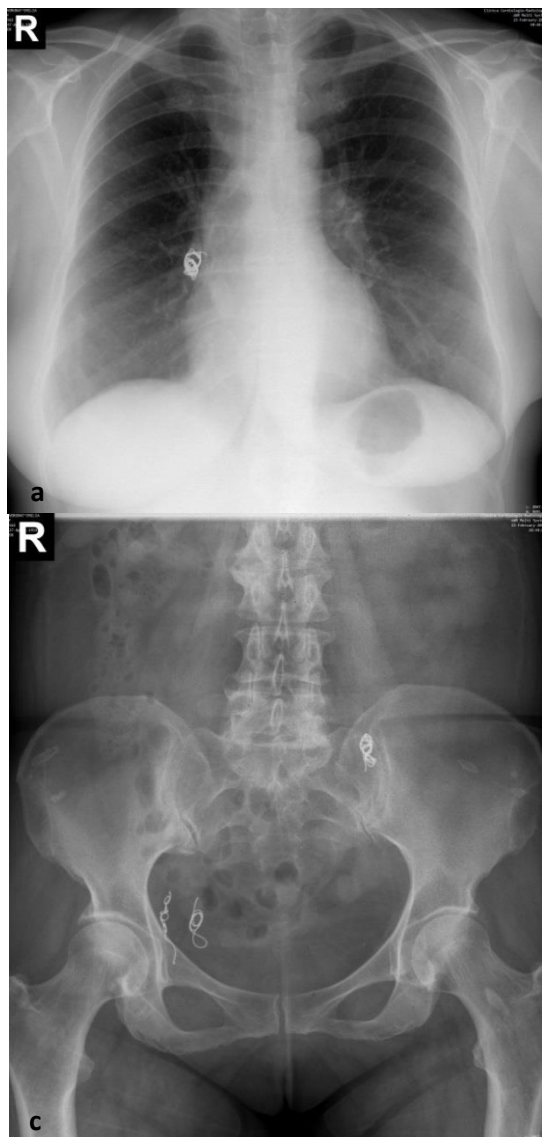


Fig. 1. Chest X-ray: postero-anterior view (a) and lateral view (b) with the coil on the right hilum topography and pelvis X-ray (c) with the coils on the hypogastric and gonadal veins.

The procedure started by using the 6 French (F) Amplatz retrieval device (eV3 Endovascular Inc. ®, Plymouth, MN) inserted through a JR6F catheter which was placed into the RILPA. Because the coil recovery failed at the first attempt, the Amplatz device was removed and via the JR6F catheter, a 0.035"PTFE guide wire was inserted until it reached the RILPA. The JR catheter was removed and a 10F coronary sinus sheath (St. Jude Medical-CPS Direct®) was introduced over the wire into the RILPA. By inserting a rat-tooth (Boston Scientific® $\phi=2.4$ mm) foreign body extraction device, the metallic coil was gently but firmly grasped from its proximal

part (Figures 2). Although smooth traction maneuvers were performed, we were not able to displace the distal part of the coil. Considering the time passed from the dislodging of the coil until the attempt of extraction and the endothelialization process of the distal part, we decided to cease the procedure. The X-ray performed after the procedure, showed the unspun metallic coil on the right pulmonary hilum topography (Figures 3a, 3b). The patient remained asymptomatic and hemodynamically stable during the whole procedure. At discharge, long-term oral anticoagulant therapy with Dabigatran 150 mg twice a day was prescribed.

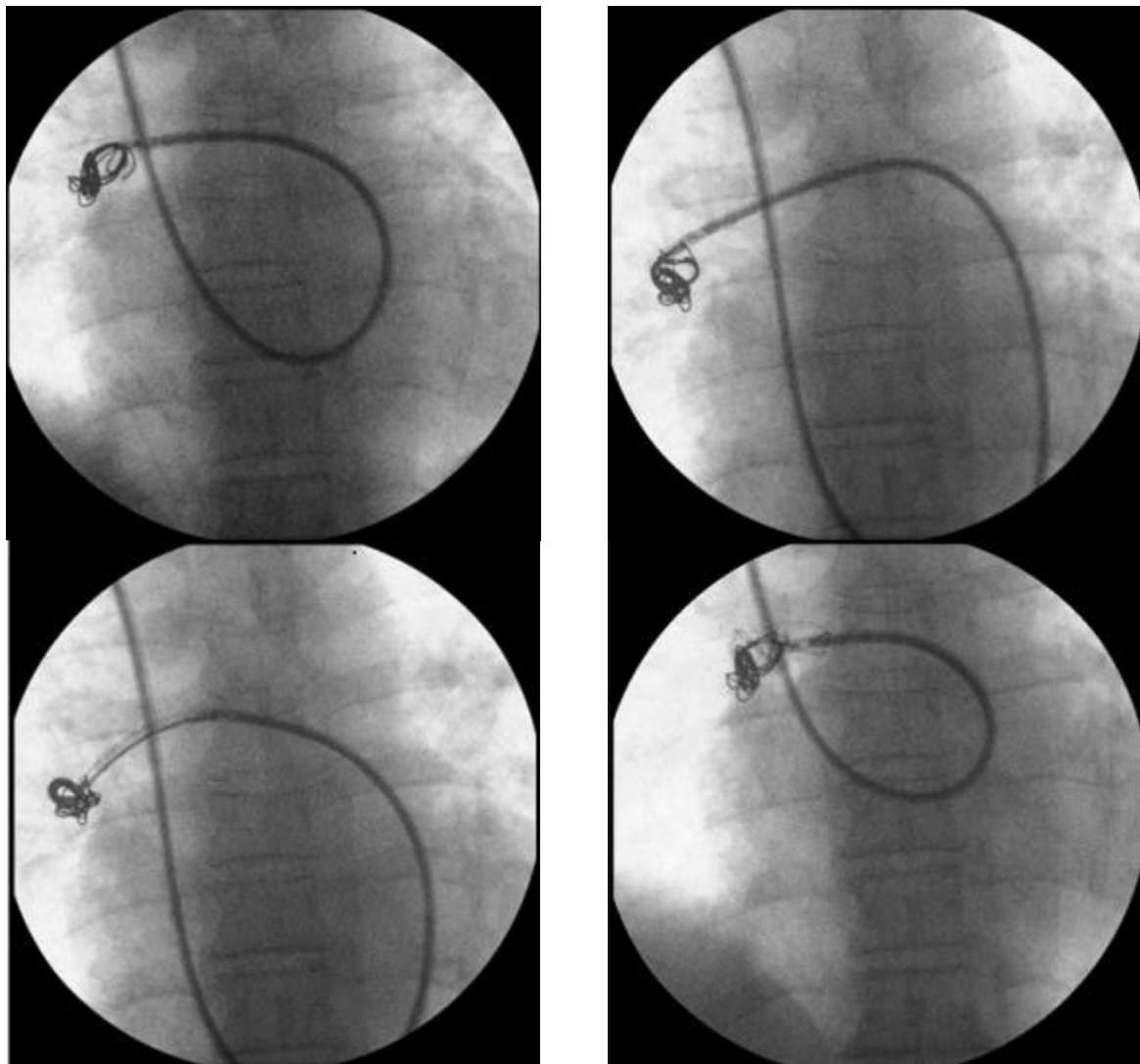


Fig. 2. Different moments of the interventional approach for metallic coil extraction from RILPA with rat-tooth device.

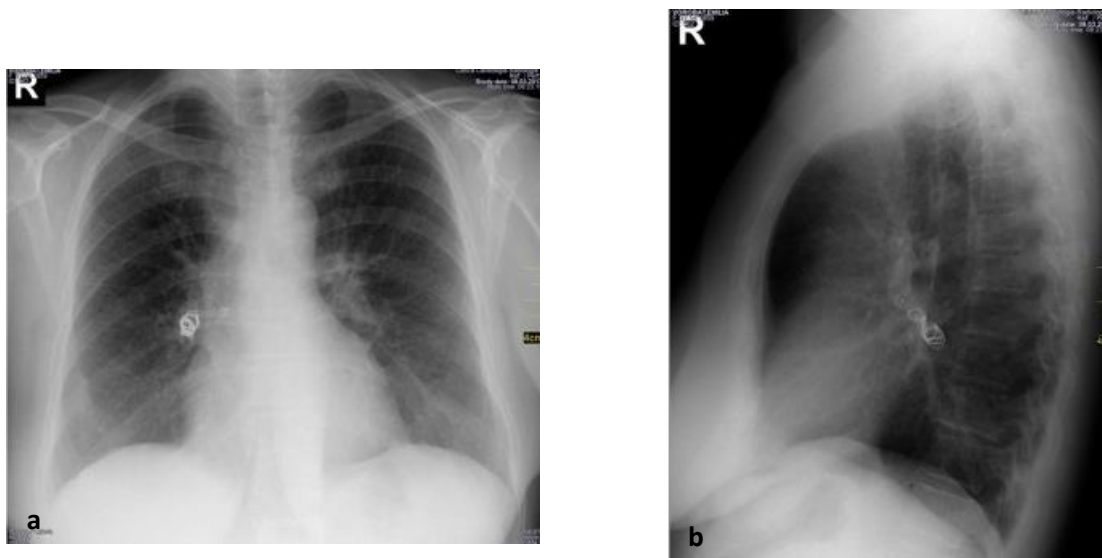


Fig. 3. Radiological aspects after the intervention postero-anterior (a) and lateral view (b) of chest X-ray with the unspun coil.

Discussions

The usually asymptomatic status and the “benignity” of the migrated coils are the reasons for the small number of case reports about the percutaneous extraction and also account for a limited experience. The true complication rate of foreign bodies migration is rather unknown due to the lack of large studies. It is believed that there are many cases of acute and chronic embolism caused by foreign bodies migration (often incidental finding in autopsies).

In 2015, a review about the cases of coil migration into pulmonary circulation was published. There are six cases of migrated coils in pulmonary arteries presented. In half of them, the patients were asymptomatic and treated conservatively. In another case, the coil was retrieved percutaneously from the right lower lobe pulmonary artery, using an intravascular forceps, immediately after the migration. S. Gulati, et al [5] reported the retrieval of a migrated coil, via snare during the second attempt. The management of coil migration in asymptomatic patients is a controversial issue. Surgical procedures have been done to retrieve coils [6, 7].

In the presented case, our patient had two thrombotic events induced by the migrated

coil. Considering the high risk of thrombotic recurrence, the indication for long-term oral anticoagulant therapy, and the fact that the patient excluded from the beginning the alternative of a surgical extraction, delayed coil retrieval via percutaneous approach was attempted.

Two devices were used, a cardiac gripper which was unsuccessful, and a Gastroenterology-specific rat-mouth device that succeeded by partial detachment (the distal part of the coil was strongly fixed in the artery requiring procedure cessation due to the risk of arterial rupture). In this case the long term period (5 years) from lodgment to the attempt of extraction has prevented the extraction procedure. That is just another example why the extraction should take place as early as possible after the primary event.

If we would have succeeded to detach the distal part of the coil from the RILPA, another problem would have been the externalization of the coil. We thought there would be two ways for the final retrieval from the subclavian vein: either through spontaneous unstringing at the subclavian puncture point or by using a new contralateral rat-tooth to help to unstring the device [8-9].

Conclusion

Our patient needs careful periodic clinical and radiological follow-up in order to monitor coil localization and development of complications such as thromboembolism or chronic pulmonary hypertension due to the presence of a foreign body at that level.

Percutaneous extraction of pulmonary artery migrated coil could be feasible in those cases with recent occurred migration (the coil is not strongly attached to the arterial wall) with significant complication - pulmonary thromboembolism favored by the coil presence - in order to avoid long-term oral

anticoagulation therapy. Otherwise, the procedure risks may exceed the benefits, so the surgical approach should be taken into account.

Consent

Written informed consent was obtained from the patient for publication of this case report.

Competing interests

The authors declare that they have no competing interests.

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