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Endovascular Retrieval after Migration of Nexplanon® in a Subsegmental Pulmonary Artery: Case Report

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Abstract

We report an unusual case of a 31-year-old woman who presented to the emergency room with acute chest pain. Computed tomography angiography revealed a lingular pulmonary infarction. Pulmonary embolism was due to a non-cruoric subsegmental pulmonary artery emboli. It corresponded to the distal migration of a contraceptive implant inserted subdermally in the left arm a few months ago (Nexplanon®). Endovascular retrieval was performed successfully with no complications.

Keywords: Interventional radiology, endovascular, migration, Nexplanon, contraceptive implant

Introduction

Nexplanon® is a progestogen-only subcutaneous implant, containing 68 mg of etonogestrel, consisting of a long-acting contraceptive device that entered the European market in June 2010. The implant should be disposed close under the skin in order to avoid blood vessels and nerves found deeper in the sulcus between the muscles in the arm. Nexplanon® is an updated version of the bioequivalent Implanon®, modified to be radio-opaque for radiographic detection and precise insertion with the aid of a new applicator device.

Migration of Nexplanon® is a rare complication and intravascular insertion is estimated at 1.3 per million implants.

We report herein a subsegmental pulmonary artery migration of Nexplanon® implant and its successful endovascular retrieval.

Case Presentation

A 31-year-old woman with a medical history of type 1 diabetes was referred to the emergency department for sudden onset of left anterior chest pain and persistent tachycardia. Blood pressure, respiratory rate, and oxygen saturation were within normal limits. Physical examination was normal, and the electrocardiography showed a sinusal rhythm with no axial deviation or no intreventicular conduction delay. D-dimers, troponin, and C-reactive protein were within normal levels.

Chest X-ray revealed a left paracardiac linear opaque image which could be easily mistaken for a vessel (Figure 1).

Computed tomography (CT) pulmonary angiography showed a subpleural parenchymal infarction of the lingula beyond a linear metallic foreign body deeply embedded in a subsegmental inferior lingual artery (Figure 2a-c).

When delving into medical history, we realized that a Nexplanon® implant was inserted subcutaneously in the arm 3 months ago and was no more palpable.

The painful pulmonary infarction and the desire for a pregnancy were in favor of an attempt to withdraw the device.

The multidisciplinary staff decided that the first attempt would be endovascular retrieval, even if the foreign body was too distal.

Through the right common femoral vein, a 90 cm-6F Sheath (Flexor® Check-Flo® Introducer; Cook Bloomington, USA) was introduced and positioned in the left pulmonary artery for stability and navigation safety in the case of vascular rupture. The lingular artery was catheterized with a JR 4.0-4F (Cordis Infiniti Diagnostic Catheter, Miami Lakes, FL, USA). A 2.9F microcatheter (Maestro®, Merit Medical Systems Inc., South Jordan, USA) was pushed in the subsegmental artery until the upper tip of the implant. A micro-loop snare (Amplatz Goose neck® Snare Kit; ev3 Inc. Plymouth, USA) of 2 mm in diameter was too small to catch the implant. As the implant filled the entire lumen of the tiny vessel, we pushed a hydrophilic J-shaped guide wire 0.035 inch (Guide Wire M angled; Terumo Corporation Tokyo, Japan) along the implant in order to create a space where the loop of the 10 mm snare could be pushed and catch the tip of

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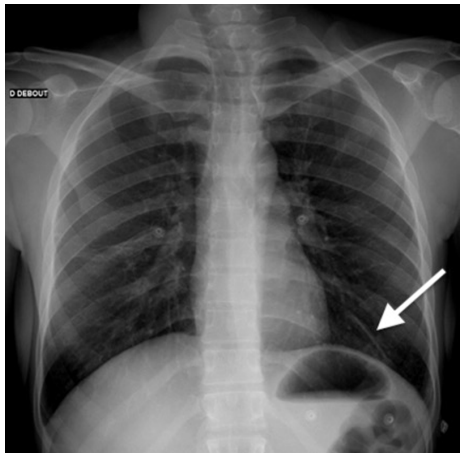

Figure 1. Chest X-ray showing left paracardiac linear opacity (arrow).

the implant. Then, we gently mobilized and extruded the device, taking care not to strike the carrying artery (Figure 3a-b).

Discussion

Etonogestrel implant migration is very rare and primarily occurs in proximal veins/arteries such as the axillary area.[1] The Food and Drug Administration's Adverse Event Reporting System revealed 38 cases of implant migration with 9 cases into the pulmonary arteries.[2]

Different possible explanations for the device to migrate into a pulmonary artery involve improper placement into the basilic vein during the insertion procedure or deployment deeply into the areolar tissue close to the elbow joint which might induce a secondary shift in the venous system.[2,3] The device is designed to be positioned subdermally at the inner face of the upper nondominant arm close to 7 cm above the elbow joint, in the groove between the biceps and triceps. Precise insertion instructions allow feeling the implant under the skin.

Clinically, most of the patients are asymptomatic but may complain from chest pain or shortness of breath.[4] Most often, implant migration is discovered when the patient comes for its removal from the arm.[2]

One should consider first that the implant could be non-palpable in the arm when deeply inserted or in case of obesity. In this situation, ultrasound is recommended to depict it.

On the other hand, as Nexplanon® rod is coated with radio-opaque barium sulfate, x-ray may be helpful to locate the implant. When necessary, a chest CT could be performed to better estimate endovascular migration.

A multidisciplinary discussion including radiologists, surgeons, and gynecologists is recommended in case of Nexplanon® migration to assess treatment options and minimize further complications.

An intravascular foreign body may lead to serious cardiopulmonary complications including infection, thrombosis, arrhythmia, and cardiovascular perforation.

Management options include endovascular or video-thoracoscopic retrieval or regular surgery.[5,6]

Endovascular retrieval is the first choice method. Selectively catheterizing into the concerned pulmonary artery provides a significant success rate with limited morbidity and mortality.[3,7] Endovascular retrieval is, however, technically challenging and needs to be performed by a trained interventional radiologist to minimize the risk of vessel rupture particularly when the implant is too distal and fixed by the endothelization process.[8]

Conclusion

Pulmonary artery migration is a rare complication of the Nexplanon® subcutaneous implant. This case illustrates a multidisciplinary approach for proper diagnosis and adequate and effective treatment. An endovascular procedure by trained interventional radiologists was successfully performed in that case, and a subsegmental pulmonary artery embolic implant was gently retrieved.

Informed Consent: Written informed consent was obtained from the patient who participated in this study.

Peer-review: Externally peer-reviewed.

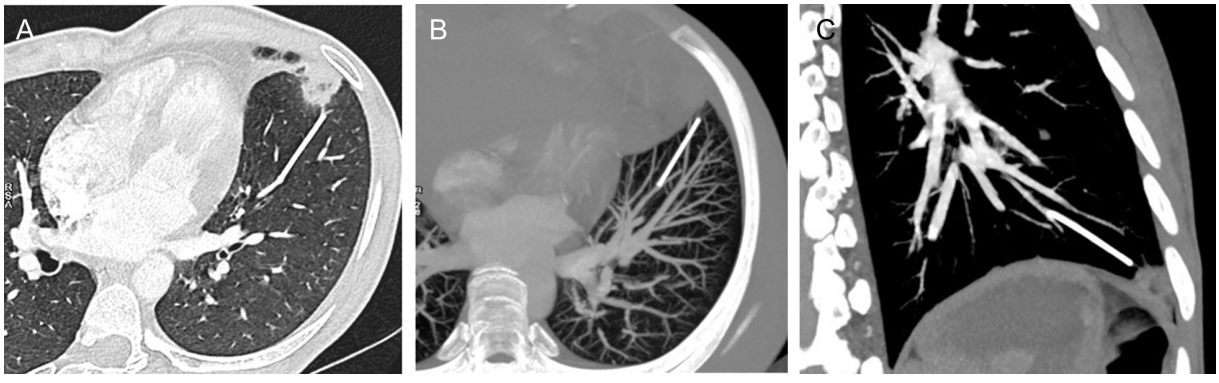

Figure 2. (A) Computed tomography scan in axial view showing a subpleural lingular infarction. Axial (B) and sagittal (C) views in maximum intensity projection with large windowing show the radio-opaque Nexplanon® deeply embedded in a subsegmental inferior lingual artery causing infarction.

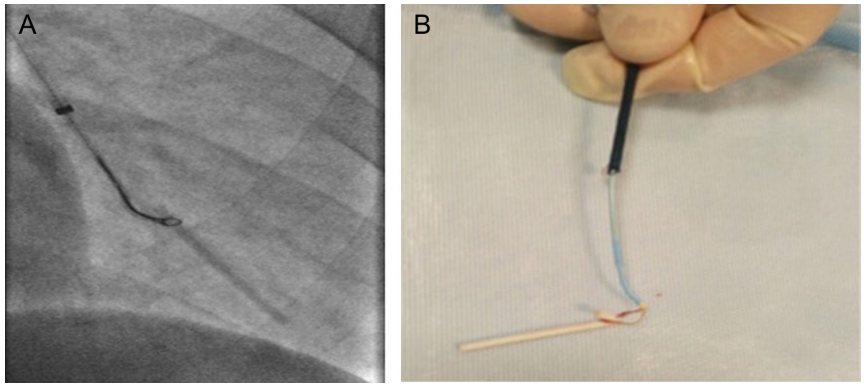

Figure 3. Chest angiographic view (A) and image (B) of the retrieval with a 1 snare loop catching the upper tip of the implant.

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