

Migration of a Progestin Implant into a Pulmonary Artery: Observation of a Case at the Reference Health Center of Commune III of the District of Bamako in Mali

Hamady Sissoko¹, Souma Kodio¹, Hamidou Albachar¹, Cheickna Sylla², Salif Diarra¹, Sidy Moctar Diakité¹, Mohamed Traoré¹, Souleymane Traoré¹, Ibrahim Fomba¹, Ouncoumba Diarra¹, Nana Bah¹, Drissa Diarra¹, Mahamoudou Coulibaly³, Bocary Sidi Koné⁴, Hawa Samaké⁵, Ahmadou Coulibaly⁶, Mamadou Traoré⁶, Seydou Z. Dao⁷, Sitapha Dembélé⁸, Samou Diarra⁸, Konimba Koné⁶, Alou Samaké⁹, Sanogo Siaka Amara²

¹Reference Health Centre of Commune III of the District of Bamako, Bamako, Mali

²Department of Gynecology and Obstetrics, Gabriel Toure University Hospital Center in Bamako, Bamako, Mali

³Department of Gynecology and Obstetrics, Kalaban Coro Reference Health Centre, Bamako, Mali

⁴Mohamed VI Perinatal Clinic, Bamako, Mali

⁵Reference Health Centre of Commune V of the District of Bamako, Bamako, Mali

⁶Point-G Obstetrics and Gynecology Department of University Hospital Center, Bamako, Mali

⁷Reference Health Centre of Commune II of the District of Bamako, Bamako, Mali

⁸H Department of Gynecology and Obstetrics of the Fousseyni Daou Hospital in Kayes, Kayes, Mali

⁹Reference Health Centre of Commune VI of the District of Bamako, Bamako, Mali

Email: hamadysis79@gmail.com

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Abstract

It was a 36-year-old patient, 5th Pregnancy, 5th Delivery, 4 live children, and I deceased, had a consultation in the department for the removal of implants. Questioning revealed that she had had the implant three years ago without medical follow-up. It was in view of the difficulties in extracting the capsule that the chest X-ray and CT scan carried out concluded that the implant had migrated into a branch of the left pulmonary artery. Therapeutic abstention has been the attitude of cardiovascular surgeons.

Keywords

Migration, Implant, Pulmonary Artery, Bamako

1. Introduction

Nexplanon® is a long-acting, non-biodegradable, etonogestrel-based contraceptive

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implant intended to be inserted subcutaneously into the arm [1]. The migration of these implants is a major complication of this long-acting method. A first alert on the risk of migration of the NEXPLANON implant, particularly in the pulmonary artery, was issued in 2016. According to pharmacovigilance data available at the time, 18 cases of migration in the blood vessels and chest wall had been reported between 1998 and 2015 according to the French National Agency for the Safety of Medicines (ANSM) [1]. The ANSM stresses that the exact cause of these migrations has not yet been identified and considers several hypotheses [2] [3]: Insertion too deep at the time of placement, leading to the positioning of the implant directly in a blood vessel. Another possibility would be that the migration occurs at a distance from the installation, following a shock or the repetition of certain movements. Finally, This migration could be linked to an anatomical particularity. We report here the case of a migration of the implanon capsule into a branch of the pulmonary artery.

2. Clinical Case

This is the case of a 36-year-old patient, 5th Pregnancy, 5th Delivery, 4 live children, and 1 deceased, who had a consultation in the department for the removal of an implant. According to the patient, the progestogen implant was placed in the left arm 3 years ago in a health facility after a family planning consultation. According to her, immediately after insertion, she felt the Implanon capsule on the affected arm as well as on the operator. Then, she would have spent three years with the implanon capsule without any medical check-up. At the end of the third year, she returned to the said facility for the removal of her implant, which is no longer palpable. Then, she was seen in two other health facilities for the same reason. It is in the face of all these difficulties that she was received at the reference health center on June 3, 2021 where an ultrasound performed did not find the implant in the arm. It was then that a requested frontal X-ray of the chest found a linear image in the field of the left lung. A chest CT scan was then performed to confirm the presence of the implant in a branch of the left middle lobar artery.

On general examination, the patient is asymptomatic, and she has a good general condition, a well-coloured conjunctiva, a blood pressure of 120 to 70 mmHg, $T^{\circ} = 37.2^{\circ}C$, a pulse of 88 beats per minute, FR = 16 cycles/min, an oxygen saturation of 100% in the ambient air.

The physical examination is completely normal. The patient was referred to a vascular surgery department which, after a clinical examination, recommended expectation with regular follow-up.

3. Discussion

The subcutaneous implant is a long-acting contraceptive method. It contains etonogestrel and comes in the form of a stick 4 cm long and 2 mm in diameter. Implanon is radiopaque and has a specific applicator (inserter) (Figure 1).



Figure 1. Implanon loaded in its insertion device.

It is valued by the Pearl Index at 0.05. This index, which tends towards 0, positions it as one of the most effective contraceptives, along with sterilization and the intrauterine device [2]. It should be inserted on the inner side of the non-dominant arm in a strict subcutaneous position. The implant insertion site is located precisely in front of the triceps, about 8 to 10 cm from the medial epicondyle of the humerus (formerly called the epitrochlea) and 3 to 5 cm below the groove that separates the biceps from the triceps (**Figure 2**) [3].

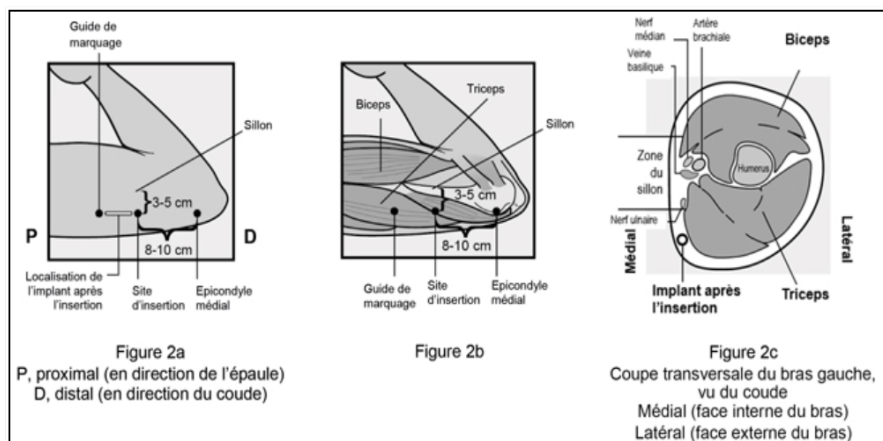


Figure 2. Insertion site of the implant [1].

Our case is that of a 36-year-old G5P5V4D1 asymptomatic patient in whom implanon was inserted 3 years ago in the left arm. The contraceptive device was non-palpable at the time of removal. In the literature, several cases of migration have been described, the majority of which are asymptomatic, as our observation. Thus, Ohannessian A. and Al identified 12 cases from 2012 to 2017, 10 of which were asymptomatic. 5 were removed by interventional radiology, 5 by surgery and

2 left in place [4]. Another study in Mali describes an asymptomatic case of migration of the contraceptive device into the right pulmonary artery whose extraction attempt failed and the implant was left in place [5]. On the other hand, some studies have found symptomatic cases, such as that of Patel A., who reports a case with thoracic symptoms, but the patient chose not to continue the operation and the implant remained in place [6]. Maroteix P. also reports a case with accentuated chest pain on inhalation and exertional dyspnea, the capsule extraction was done by the interventional radiology team endovascularly [7]. Also Sarah K. reports 38 cases, the majority of which were asymptomatic, however, 7 cases reported symptoms such as pain, discomfort, and dyspnea in association with implant migration. 3 cases also describe pulmonary fibrosis and skin reactions following a migration of the implant to the vascular system, chest wall, and other distant body sites. 16 cases reported surgical removal in an operating room [8]. The contribution of imaging in the localization of the non-palpable implant is crucial. In our case, an ultrasound of the affected arm did not find the device in place, which is why we performed a chest X-ray which found a linear image in the left lung field (Figure 3). Computed tomography made it possible to locate the encapsulated implanon in a branch of the left pulmonary artery (Figure 4, Figure 5). The sites of migration are variable: pulmonary artery or lung [4] [6] [8], chest wall [8], vascular system other than the lung [8], armpit or clavicle or neck or shoulder [8].

Indeed, after a contraceptive implant migration into the pulmonary artery, there can be serious cardiopulmonary complications such as infection, further migration and thrombosis [5]. On the therapeutic level, we have recommended abstention in our case. Extraction of the contraceptive device in vascular migration by interventional radiology or thoracoscopic surgery has been reported by authors Sarah K. and Motareix P [7] [8]. But therapeutic abstention has also been the conduct of certain authors such as Patel A. and Koné Y. [5] [6]. In its letter to healthcare professionals in September 2016, the marketing authorisation holder announced information about its radiopaque implant, Nexplanon. Indeed, between 1998 and 2015, he reported 18 cases of migration of etonogestrel implants into blood vessels, including the pulmonary artery and chest wall [1].

According to the same laboratory, the cause of this migration into the vessels has not yet been determined. However, improper handling during insertion, such as direct insertion into a vein or deep insertion, is a possible mechanism [1]. Successful implant placement and removal depends on its subcutaneous insertion into the non-dominant arm, performed correctly and carefully in accordance with the instructions contained in the SmPC reported by Bensouda-Grimaldi L *et al.* in 2005 [9]. The healthcare professional who inserted the implant as well as the patient should be able to palpate the implant under the woman's skin after insertion [1]. It should be inserted subcutaneously, just under the skin. An implant inserted deeper than subcutaneous (deep insertion) may not be palpable and its location and/or removal may be difficult. A non-palpable implant should always be located before removal. If the implant is not palpable and due to the

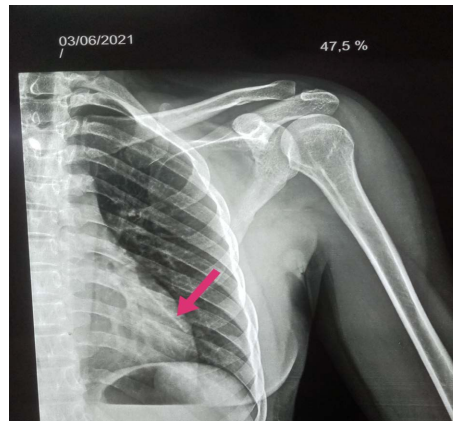


Figure 3. Chest X-ray from the front showing the implant in the left lung field.

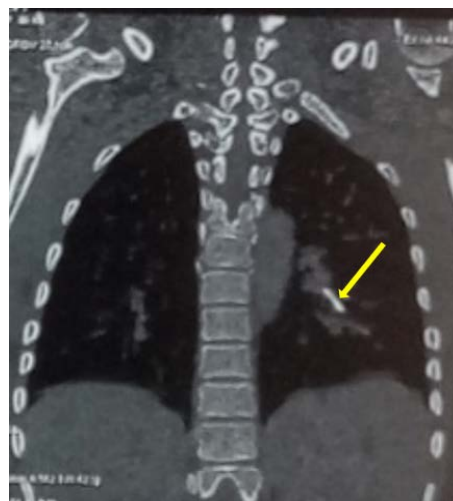


Figure 4. Frontal section of the chest CT scan showing an implant in the left pulmonary artery.

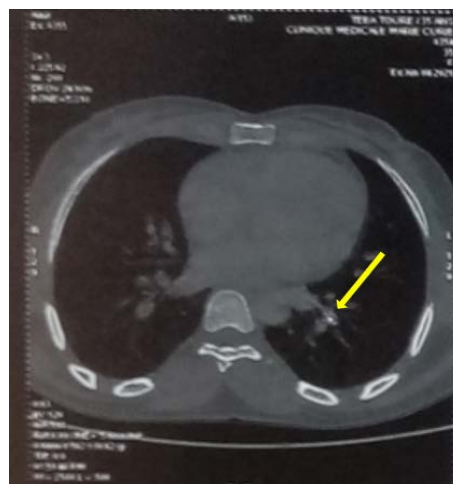


Figure 5. Horizontal cross-sectional chest CT scan showing the implant encapsulated in the left pulmonary artery.

radiopaque nature of Nexplanon, a two-dimensional X-ray should be performed to verify its presence in the arm [1].

4. Conclusion

Implanon is a long-acting method of contraception that is frequently used, but not without complications. Its migration into the vascular system is a rare and most often asymptomatic complication but can be potentially serious. Its use requires adequate training of health professionals and regular monitoring. Its non-subcutaneous palpation requires radiological examinations to be carried out for its location, as recommended in the summary of product characteristics.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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