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Migration of Subdermal Implant to the Left Pulmonary Artery

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Abstract: ***Subdermal contraceptive implants are usually inserted subdermally and carry the possibility to migrate within a small range, usually less than 2 cm from the insertion sites; significant migration over 2 cm is rare. This paper discusses the case of a 22 - year - old female patient with a migrated subdermal contraceptive implant in the left pulmonary artery. On chest computed tomography, roughly a 4 cm long linear hyperdensity foreign body in the left lower lobe was found and was identified as a migrated implanted in a subsegmental pulmonary artery branch. An interventional cardiologist attempted endovascular removal of the left pulmonary artery graft using the right common femoral vein as access, without success. Very few cases have been reported of complications with inserting and removing the subdermal contraceptive implants as it is considered a reasonably safe procedure in the hands of physicians familiar with the technique. Therefore, if a properly trained individual had carried out the correct procedure of inserting a subdermal implant, the migration of an implant over 2 cm should not occur.***

Keywords: Cardiothoracic surgery, cardiology, foreign body migration, lung, contraceptive implant

1. Introduction

Subdermal contraceptive Implant is a 4 cm rod - shaped coated with barium sulfate that is usually inserted into the inner side of the non - dominant arm. It is unusual for patients who undergo subdermal implant placement by trained physicians to develop complications from the procedure. However, rare complications may include infections at the insertion site, injuries to nearby blood vessels and nerves, hematoma, or extensive fibrosis surrounding the implant [1]. Rarely subdermal contraceptive implants can migrate far from the insertion site [2]. As a result, a few cases in the literature have reported pulmonary embolization of the device [3]. In such cases, patients may be completely asymptomatic or present with symptoms such as dyspnea, hemoptysis, or chest pain. The implant is radiopaque and can be detectable by imaging techniques like X - ray or computed tomography (CT) scans. At the end of its intended use, the contraceptive implant should be extracted through a simple incision overlying the implant in the outpatient setting. In this case, we are reporting one of the rare cases of asymptomatic migration of Implanon to the pulmonary artery in a 22 - year - old female from implantation to extraction.

2. Case Presentation

A 22 - year - old woman with an unimportant medical/surgical history had a subdermal contraceptive implant inserted into her left upper extremity for contraception after giving birth to her second child in July 2023. She could not feel the contraceptive implant after insertion and mentioned this when she visited her gynecologist for a follow - up visit. An ultrasound of her left arm was performed and was not detected; therefore, she underwent a chest X - ray (Figure 1) and a linear foreign body projected into the left lower lobe region was found. The findings strongly suggested an embolized contraceptive device, and a chest CT scan was recommended for confirmation. On chest computed tomography, a linear hyperdense foreign body approximately 4 cm long in the left lower lobe was favored to be a migrated implant in the left subsegmental pulmonary artery branch (Figure 2).

Figure 1: Chest X - ray showing implant in the left lung (arrow)

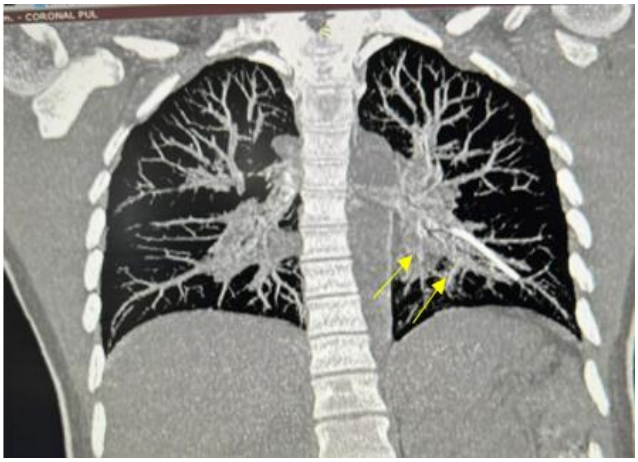

Figure 2: CT chest showing migrated implant into the left pulmonary artery branch (arrows).

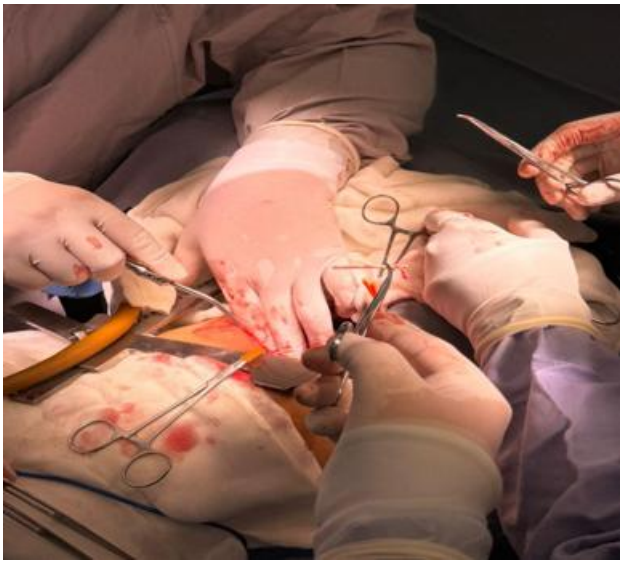

Figure 3: Surgical removal of the implant

The patient denied any symptoms associated with the migrated implant, including chest pain, cough, hemoptysis, or dyspnea within the previous three months. After consultation with interventional cardiology, removal of the foreign body from the implant was considered via an endovascular approach to the pulmonary artery using a right common femoral vein access. Removal was performed under moderate sedation using the right common femoral vein as access. A triaxial system was used, consisting of a 12F base sheath positioned at the level of the intrahepatic inferior vena cava (IVC), an 8F curved sheath advanced to the proximal left pulmonary artery, and a 4F angled diagnostic catheter in the left inferior lobar artery. A 10 - mm snare was used through the 4F catheter to capture the superior portion of the implant. Although the device was properly secured with the snare, it could not be inserted into the 8F sheath because it had folded back on itself at the snare site. Due to the potential for device injury with further forced removal, the catheterization was classified as unsuccessful, and a surgical approach was decided upon. The patient was scheduled for surgical resolution, where a left posterolateral thoracotomy was performed, approaching the level of the fifth intercostal space, midline, and posterior left axilla. A blunt dissection was made between pulmonary segments nine and ten of the left pulmonary lobe until the device was found attached to the left pulmonary vein. The device was successfully removed. The lung dissection was closed with a purse string using absorbable polyglactin 910 suture, confirming hemostasis. A 22 Fr endopleural tube was placed toward the surgical bed. A follow - up chest x - ray was performed 24 hours later, showing adequate chest re - expansion with no evidence of hemothorax. The device was removed 48 hours later, and the patient was discharged 72 hours later.

3. Discussion

A subdermal contraceptive implant is a progesterone - only contraceptive method containing 68 mg of etonogestrel [3]. Significant migration of a subdermal contraceptive implant larger than 2 cm is rare and occurs mainly caudally from the insertion site. The risk of other side effects is estimated to be approximately up to 1.1% [4]. These may include ruptured subdermal implants, formation of fibrous adhesions around the implant, or deep insertion. In this case, it is hypothesized, based on the migration path, that the implant was inadvertently placed in the basilic vein during insertion. As a result, the subdermal contraceptive implant migrates through the veins of the upper extremities and settles in the branch of the pulmonary artery in the left posterior basal segment. Therefore, if a subdermal contraceptive implant dislocates in the pulmonary artery, intervention to remove it should be performed [5]. In this case, cardiothoracic surgery utilized a surgical approach to remove the implant from the left pulmonary artery.

Proper placement in the groove between the biceps and triceps, 7 cm above the elbow crease, is critical to prevent migration, as this case underscores. The implant should be palpable throughout use and can be detected on X - rays and CT scans, as it is coated with barium sulfate [6]. In this case, the patient could not feel the implant, and the physician recommended that she undergo an X - ray and CT scan to locate the implant [7]. Studies show that the use of ultrasound is highly effective in removing impalpable implants when the subdermal implant is inserted deep into soft tissue [8]. Most impalpable contraceptive devices are removed using local anesthesia with the assistance of ultrasound. Ultrasound - guided dissection, using a 22 G spinal needle to stabilize the midpoint of the implant, is the most effective technique for removing such implants [9].

4. Conclusions

Subdermal implants are generally safe and effective, but complications such as migration can occur, even when inserted by trained medical professionals. In our case, the implant migrated into the pulmonary artery via a basilic vein, highlighting the need for careful monitoring and immediate intervention. Fortunately, the patient did not suffer serious consequences, and the migrated implant was successfully retrieved using surgical techniques. Healthcare professionals should inform patients about potential complications and emphasize the importance of ensuring the implant is palpable. Patients should be informed of the importance of reporting any concerns or unusual symptoms immediately. While complications with subdermal contraceptive implants are rare, healthcare professionals should remain alert and prepared to handle unexpected situations.

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