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Case report

Intravascular migration of contraceptive implants: two more cases☆,☆☆

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Abstract

Cases: In addition to previously published case reports, further cases of intravascular migration of contraceptive implants have been identified from an information request to two national adverse reaction spontaneous reporting systems. We report on two new cases of insertion into the venous system with subsequent embolism to a pulmonary artery.

Conclusion: Incorporating barium sulfate into the implant has facilitated diagnosis of these very rare adverse events with the initial diagnosis of embolism to the pulmonary arterial tree made by chest X-ray. Removal of an implant from a segmental branch of a pulmonary artery is technically challenging and not without risks. Unsuccessful removal appears to be preceded by a delay in diagnosis leading to endothelialization of the implant in the pulmonary arterial wall.

Implications: Subdermal placement of contraceptive implants over the anterior surface of the biceps rather than in the sulcus between the biceps and triceps may negate this rare but reported risk.

Keywords: Contraceptive implant; Intravascular; Lung; Pulmonary embolism; Pulmonary artery

1. Introduction

The single-rod etonogestrel (ENG) implant Implanon was available in the UK between 1999 and 2010. We were aware over this 11-year period that implants occasionally "go missing" in the body and cannot be localized [1]. Positive ENG blood tests confirmed the presence of the implant, but these non-radiopaque implants were difficult to demonstrate using imaging techniques. We could not confirm our suspicions that these implants were located in the lung [2]. However, we felt that inadvertent insertion of an implant intravascularly and transit in the venous system to the pulmonary arterial system was possible. One of the authors (D.M.) has seen two patients in which the key features in the clinical history included painful implant insertion over the area of the sulcus between the biceps and triceps, the site previously recommended by the manufacturers. In both cases, there was associated extensive bruising over the upper arm, with the distal end of the implant being easy to feel initially and then becoming impalpable. High-frequency ultrasound scanning and magnetic resonance imaging of the arm, chest X-rays, and computerized tomography scans failed to locate the implants.

The advent of a modified radiopaque implant and applicator (proprietary name Nexplanon in some countries and Implanon NXT in others) in 2010 [3] makes the imaging and evaluation of these "lost implants" easier.

Individual case reports of suspected adverse reactions which are sent to regulators spontaneously by health

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Table 1
Summary information about published cases and cases reported to the regulator of insertion of contraceptive implants into the venous system and intravascular migration to the pulmonary tree

Case	Country	Publication/report to regulator	Age of woman at diagnosis (years)	Location	Outcome
1	UK	Patel et al. [6]	36	Left lower lobe	Woman declined any intervention[a]
2	France	D'Journo et al. [7]	20	Left lower lobe	Segmentectomy via video-assisted thoracoscopy
3	Ireland	O'Brien et al. [8]	23	Left lower lobe	Failed removal attempt by interventional radiology
4	France	Heudes et al. [9]	18	Right upper lobe	Successful removal by interventional radiology
5	France	Maroteix et al. [10]	27	Left lower lobe	Successful removal by interventional radiology
A	UK	Spontaneous report 2013	NK	NK	Failed interventional radiological attempt at removal
B	UK	Spontaneous report 2016	NK	NK	NK

NK = not known.
[a] As a result of author involvement with this case (M.W.), we know that this woman subsequently underwent an interventional radiological procedure 12 months after insertion which was unsuccessful.

professionals, pharmaceutical companies and users of medicines themselves are used to detect "signals" and generate hypotheses of a possible link between a medicine and an adverse effect [4]. The UK's Yellow Card Scheme is an example of such a spontaneous reporting system (https://yellowcard.mhra.gov.uk/). Data derived from Yellow Cards are publicly available for each drug in the form of Drug Analysis Prints (www.mhra.gov.uk/drug-analysis-prints/). It is important to note that the inclusion of a reported reaction in a Drug Analysis Print does not necessarily mean that it has been caused by the drug or its delivery vehicle, only that the reporter had a suspicion it may have been. The fact that symptoms occur after use of a drug and are reported via the Yellow Card Scheme does not in itself mean that they are proven to have been caused by the drug/vehicle. The Drug Analysis Prints for ENG implants show 23 reported cases of pulmonary embolism. An additional category of "device embolization" was added in 2014; the tally for device embolization currently stands at 1 (period ended 4 April 2016).

2. Enquiry to the British and Irish drug regulators

Author involvement with the published cases (M.W., S.R.) in both the UK and the Republic of Ireland (cases 1–5, Table 1) led us to wonder whether there were any further cases in these two countries. We asked the UK Medicines & Healthcare products Regulatory Agency (MHRA) about spontaneous reports of such cases through the UK Yellow Card Scheme. We also asked the Irish Health Products Regulatory Authority (HPRA) about any cases reported to their national database of suspected adverse reactions.

3. Cases identified

Four cases of ENG implant migration to other sites of the body were reported to the UK MHRA between 2010 and 2016, including case 1 of the published cases. One of these four cases could not be confirmed to be in the lung by the reporter; the implant appeared to be in the chest wall. There is, thus, a total of two UK cases not previously in the public domain (cases A and B, Table 1). The implants involved in both cases were Nexplanon. Information about the cases is anonymized and limited due to the need for confidentiality to protect individuals' identities. For example, we were not permitted access to the women's ages. Also, some reports to the regulator contain sparser information.

A single case was known to the Irish HPRA and this was confirmed to have already been the subject of a published case report (case 3, Table 1).

4. Discussion

There is one case in the literature in which an implant was reported to have been inserted into the peripheral arterial system [5]. This involved the brachial artery and was associated with profuse bleeding. Thrombus formed in the artery which became occluded. Normal arterial circulation was restored after vascular surgery.

All other published case reports are about inadvertent insertion of implants into the venous system. This is very rare, with five cases published over the last 2 years (cases 1–5, Table 1). These five case reports from three adjacent countries in Western Europe [6–10] have been written by radiologists, thoracic surgeons and emergency medicine specialists. All five reports relate to the radiopaque version of the ENG implant. There is emphasis on the subtleties of various forms of imaging but little clinical detail. However, the cases are remarkably similar in their clinical presentation and findings. In all five, the implant was not palpable in the arm and the rod showed clearly on a chest X-ray.

A major limitation of this case report is the limited information that the MHRA was able to release to us about the two further cases that were reported to them; this was due to strict internal rules about information exchange designed to protect patient and reporter confidentiality.

Heudes et al. [9] explained the intravascular journey of the implant as it travels through veins in the upper arm (from the basilic vein to the axillary vein which becomes the subclavian vein) into the superior vena cava, right atrium,