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Clinical Notes / Notas Clínicas

Fluoroscopy in the Removal of Deep Etonogestrel Implants

Fluoroscopia na Remoção de Implantes Profundos de Etonogestrel

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Abstract

Fluoroscopy is an imaging technique that uses X-rays to obtain real-time moving images. Although described in the literature in several areas of medicine, the use of fluoroscopy in some specialties remains poorly explored. The two clinical cases described demonstrate a successful removal of deep etonogestrel radiopaque implants through the use of fluoroscopy proving to be a promising technique as an alternative or complementary to conventional techniques - X-ray and ultrasound Fluoroscopy has a good safety profile with an easy learning curve, and its knowledge and use may contribute to the resolution of more complex cases of subcutaneous implant extraction.

Keywords

Fluoroscopy; Etonogestrel implants; Removal; Contraception.

Resumo

A fluoroscopia é uma técnica de imagem que permite obter imagens em tempo real com recurso a raio-X. Apesar de descrita na literatura a utilização da fluoroscopia em diversas áreas da medicina, em determinadas especialidades esta técnica permanece pouco difundida. Neste sentido, os dois casos clínicos descritos demonstram o sucesso na extração de implantes radiopacos de etonogestrel profundos através do uso da fluoroscopia, revelando-se uma técnica promissora alternativa ou complementar às técnicas convencionais utilizadas, o raio-X e a ecografia.
A fluoroscopia tem um perfil de segurança elevado com uma fácil curva de aprendizagem, pelo que o seu domínio pelas especialidades envolvidas na remoção de implantes poderá contribuir para a resolução de casos mais complexos de extração de implantes subcutâneos.

Palavras-chave

Fluoroscopia; Implante de etonogestrel; Remoção; Contraceção.

Introduction

Contraceptive implantation is a long-term and very effective contraceptive method, being used worldwide.[1] It consists of a 4 cm long ethylene venyl acetate rod, containing 68 mg of etonogestrel and 15 mg of barium sulphate; it should be placed on the inner side of the arm in the subdermis to allow for easy removal.
Since the beginning of contraceptive implant use, several cases of difficult localization and extraction have been described.[2] The latest implant - Implanon NXT, is designed to limit deep insertions by designing a new applicator. The addition of barium sulfate,[3] making it radiopaque, has allowed an easier identification. However, although easily identified, its removal is still sometimes difficult and the range of options for its resolution scarce and occasionally ineffective.[4] In this sense, the search and learning of new techniques becomes fundamental.
Fluoroscopy is an X-ray technique that enables to obtain real-time imaging. This technique, already widely studied,[5] assists various diagnostic and therapeutic procedures in different areas of medicine. This method allows the visualization of sequential images using a low dose of time dependent radiation. Literature data regarding its use to support the removal of non-palpable implants are scarce,[6,7] possibly being an advantage to incorporate this technique in deep implant removal protocols.

Clinical cases

Two cases are described involving radiopaque etonogestrel contraceptive implant removal at the Central Lisbon University Hospital (CHULC), using fluoroscopy.

Case 1: 26-year-old patient with no relevant personal history, who was referred to the CHULC Family Planning (FP) consultation for an unpalpable contraceptive implant (placed 39 months earlier at the Health Center) after unsuccessful extraction attempt in Primary Health Care with prior x-ray identification of the left arm (fig. 1). Ultrasound of soft tissue was performed at the Service and Radiology using a high frequency linear probe (10-14 MHz, GE) and after identification of the implant in subfascial location its projection on the skin was marked with a dermal pen and a new extraction attempt was made with no success.
The patient was referred to the CHULC General Surgery consultation where two attempts of removal were made, both unsuccessfully.

Figure 1 – Identification of etonogestrel implant in the left arm by X-ray

Figure 2 – Locating the etonogestrel implant in the left arm by ultrasound

One year later the patient returns to the FP consultation due to the desire to get pregnant, being for about 6 months without additional contraception. After discussing the case with the radiology service, extraction was programmed using fluoroscopy (Fig. 3), where, under real-time visualization, the extraction of the implant was performed.

The soft tissue ultrasound identified the implant in deep, subfascial and triceps level and given the previous success with fluoroscopy, this technique was again chosen resulting in the implant extraction.

Discussion

Etonogestrel implantation is a highly effective and long-lasting contraceptive method, being this the choice of many women.

It should be inserted subdermally with local anesthesia in the inner face of the non-dominant arm. Training in its introduction and removal is recommended by leading national and international societies,[8,9] knowing that a correct insertion will facilitate its extraction. However, despite a progressive improvement in results, in about 0.1% of cases, the extraction of implants becomes complex. Given the low frequency of these deep removal situations, it is important to refer these cases to Reference Centers of deep implant extraction. These should include a multidisciplinary team of Specialists with knowledge on anatomy and with upper limb surgery experience, including Plastic Surgeons, Orthopedists and Radiologists.

In this sense, the existence of different auxiliary methods to allow the extraction with success is essential. Among the imaging exams used, the best known and those presenting the best results are the X-ray (only possible after the entry in the market of the latest radiopaque implant in Portugal since 2010),[3] which allows the identification of the implant and the soft tissue ultrasound helps in its localization.[3,4] However, the continuous description of unsuccessful cases in the extraction of non-palpable implants makes the search for alternative techniques necessary. Fluoroscopy is thus presented as another imaging support option in solving difficulties in cases of extracting non-palpable implants, given the radiopaque characteristics of this contraceptive. Therefore, training and learning this technique by the specialties that implement these image-guided procedures as a routine is important.

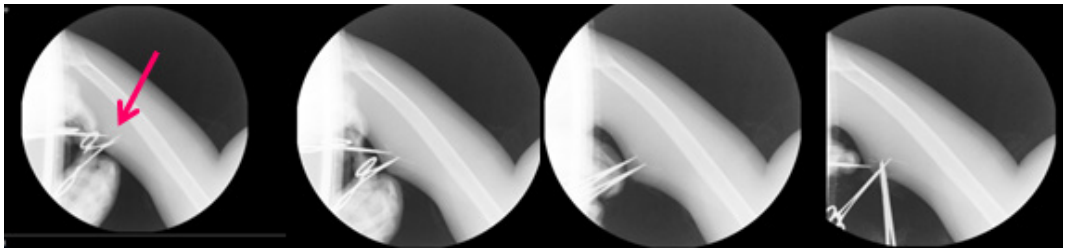

Figura 3 – Etonogestrel implant removal resorting to fluoroscopy

Case 2: A 35-year-old patient with a known history of medicated and controlled asthma, referred to the FP consultation for non-palpable implant extraction, placed 44 months ago at the Health Center. Initially, an X-ray to the arm was performed to confirm the presence of an implant in the arm. Then, soft tissue ultrasound was requested for dermal pen localization and marking, with attempt to extraction but without any success.

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References

1. Darney PD. Implantable contraception. Eur J ContraceptReprod Health Care. 2000;5:2-11.
2. Risks and benefits, advantages and disadvantages of levonorgestrel-releasing contraceptive implants. Sivin I DrugSaf. 2003; 26:303-35.

3. Isidro Amaral P, Correia L, Silveira Reis, Machado AI. Implante contracetivo não palpável – estratégias para a sua localização e remoção; Acta ObstetGinecolPort. 2013;7:256-60.
4. Mansour D, Fraser IS, Walling M, Glenn D, Graesslin O, Egarter C, Herbst J. Methods of accurate localisation of non-palpable subdermal contraceptive implants. J FamPlannReprodHealthCare. 2008;34:9-12.
5. Efficacy and radiation safety in interventional radiology. World Health Organization; InstitutfürStrahlenhygiene des Bundesgesundheitsamtes (Germany); Workshop on Efficacy and Radiation Safety in Interventional Radiology (1996 Neuherberg Germany). Geneva: WorldHealthOrganization, 2000.
6. Guiahi M, Tocce K, Teal S, Green T, Rochon P. Removal of a nexplanon implant located in the biceps muscle using a combination of ultrasound and fluoroscopy guidance. Contraception. 2014;90:606-8.
7. Sarma SP, Silverstein M, Lewis C. Removal of a norplant implant located near a major nerve using interventional radiology-digital subtraction fluoroscopy. Contraception. 1998;58:387-9.
8. Committee on Adolescent Health Care Long-Acting Reversible Contraception Working Group, The American College of Obstetricians and Gynecologists. ObstetGynecol. 2012;120:983-8.
9. American College of Obstetricians and Gynecologists' Committee on Gynecologic Practice., Long-Acting Reversible Contraceptive Expert Work Group.Obstet Gynecol. 2016;128:e69-77.
10. Pillai M, Gazet AC, Griffiths M. Continuing need for and provision of a service for non-standard implant removal. J Fam Plann ReprodHealthCareApr. 2014;40:126–32.