

Location and removal of non-palpable subdermal single-rod contraceptive implant

Ubicación y extracción del implante anticonceptivo subdérmico no palpable

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Abstract

Objective: The objective of the study was to present the experience of the family planning service Hospital General de México, in locating and removing no palpable subdermal single-rod contraceptive implants. **Materials and methods:** A descriptive, prospective, and cross-sectional study was performed from January 2011 to April 2018. **Results:** Hundred and sixty-four patients in whom the implant was not palpable were reviewed, the time between insertion and removal averaged 3.3 years (maximum 10 years and minimum 3 months). Three implants were inserted in the right arm, the rest on the left one. Forty-seven implants were found in fatty tissue (29%), 18 in fascia (11%), 94 in muscle (57%), 2 in the armpit (1.2%), and 3 were not found (1.8%). **Conclusions:** The no palpable implant is caused by an incorrect insertion technique. Migration should not be assumed as a cause of difficult location. Amount of non-palpable implants is not possible to determine due to a lack of records, but approximately 3% are considered non-palpable. Ultrasound has proven to be the study of choice to locate an incorrect inserted implant. In this case, the total number of implants was located, except in two patients.

Key words: Non-palpable subdermal single-rod contraceptive implant. Retirement. Ultrasound.

Resumen

Objetivo: Presentar la experiencia del servicio de planificación familiar del Hospital General de México Dr. Eduardo Liceaga en la localización y la extracción de implantes anticonceptivos subdérmicos no palpables. **Materiales y métodos:** Estudio clínico descriptivo, prospectivo y transversal, realizado desde enero de 2011 hasta abril de 2018 en el servicio de planificación familiar del Hospital General de México Dr. Eduardo Liceaga. **Resultados:** Se incluyeron 164 pacientes con implantes no palpables, de los cuales 161 se localizaron por ultrasonido. El promedio entre la inserción y el retiro fue de 3.3 años. Tres implantes fueron insertados en el brazo derecho y el resto en el izquierdo; tres no se encontraron. **Conclusión:** Por su fácil acceso y simplicidad, el ultrasonido es el método de elección para localizar implantes profundos no palpables.

Palabras clave: Implante anticonceptivo subdérmico de una sola varilla no palpable. Retiro. Ultrasonido.

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Introduction

Subdermal single-rod contraceptive implant has been widely accepted by users and physicians and is used by over 2.5 million women worldwide^{1,2}. In Mexico, more than 800,000 implants have been placed.

Sometimes, implants are set without following the recommended procedure, resulting in deep implants that cannot be located by palpation or are found in incorrect places, thus requiring other location techniques for their extraction³.

Training programs in all the countries where the product is available allow physicians and other health professionals to get in touch with the product profile as well as with insertion and removal methods. Attendants to these training programs can practice the techniques under professional supervision^{3,4}.

Since 2011, Family Planning Service and Radiology Departments at the Hospital General de México had collaborated with other family planning services to locate and remove difficult location implants.

The implant should only be inserted by trained personnel used to the procedure.

Important to consider the following:

- Always follow the insertion procedure described
- Check that the needle is empty after insertion
- Always palpate the implant immediately after insertion.

Causes of difficult implant location

Reports of difficult implant location are rare. The causes of these may include:

- Incorrect technical insertion
- Deep placement
- Inserting in the wrong site: biceps, dominant arm, leg, or abdomen

No application. The implant may remain in the needle after the alleged “insertion” or may have slipped out of the needle before the procedure¹⁻⁴.

Location techniques

PALPATION

Verifying implant position by palpation is essential. Implants properly inserted are evident under the skin and are easily palpated. This maneuver is an important part of the process of insertion and should always be done.

If implant is not palpable, fingers should be moved over the same path of it, from proximal to distal end

and vice versa so as to locate it. If the implant is not clearly palpable, its presence and position must be confirmed by ultrasound. If the possibility of no insertion exists, women must be advised to use a barrier method of contraception⁴.

ULTRASOUND

The inserted single-rod no palpable implants can be located by ultrasound.

X-RAY

At the beginning, they were not radiopaque so they could not be located by X-rays, but since 2012, the new implant presentation contains barium allowing its detection by this method.

Computerized tomography and magnetic resonance imaging are to be used if implant is not located by ultrasound, even though, the cost-benefit of these studies should be considered.

Location of the device under ultrasound guidance

For its easy access, simplicity, and effectiveness, ultrasound is the method of choice to locate deep non-palpable implants⁵.

Implants can be located by ultrasound transducers commonly used in gynecology; however, better results are obtained with high resolution 7.5 MHz linear array ultrasound linear⁶⁻⁸.

It is important to approximately determine the insertion site. Information can be obtained from the user's card as well as asking the patient how and in which direction, the implant was inserted. In addition, a scar at the site of insertion must be found.

A correctly inserted implant might be found in the inner side of the non-dominant arm using the epicondyle 6-8 cm directly above it as reference and below the skin (subdermal tissue), implants inserted before 2008 were located 2 cm above the currently proposed (black line) site (Fig. 1).

The implant can be identified and located by its acoustic shadow. The ultrasound image of the implant is very distinguishable, like a small but very clear echogenic drop on a cross section, and as a linear echogenic image on a longitudinal section^{6,7}. We make a mark in the distal and proximal ends of the Nexplanon™ (Implanon™) and we joint them. Its marks

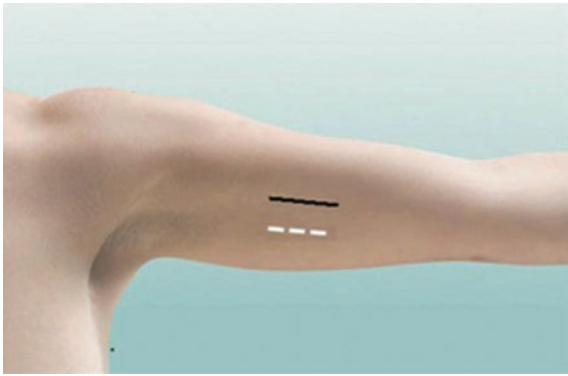


Figure 1. Correct insertion site. Implant location, currently recommended site (white line), prior insertion site (black line).

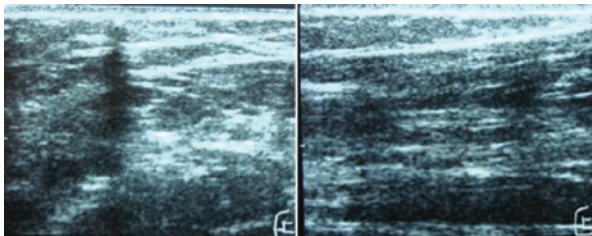


Figure 2. Ultrasound of the arm cross section. Drop-like image of the implant and longitudinal section, linear image of the implant with its acoustic shadow.

point out the right site where to find the device (Figs. 2 and 3).

Removal technique

An aseptic technique is employed. We use 2 ml 1% lidocaine local anesthetic. Over the middle of the mark of Nexplanon™ (Implanon™), an incision is then made longitudinally slightly wider than the diameter of the index finger so that the finger can be introduced to check the position of the device by feel. The subcutaneous tissue and fat are separated by longitudinal blunt dissection down the fascia, skin separators are used and the fascia is opened using blunt dissection. When the device is in muscle, it can be difficult to feel until you are below the fascia. If it is in muscle, blunt dissection is again used, and eventually, the Nexplanon™-(Implanon™) will be seen and it can be grabbed using forceps and gently pulled out. The incision is closed with Sarnoff suture⁸.

Materials and methods

A descriptive, prospective, and cross-sectional study was performed from January 2011 to April 2018. Patients



Figure 3. Mark of the implant.

were generally referred to our institution when the device is not palpable or when an attempt at removal of a palpable device has not been successful. Hundred and thirty-eight patients from Family Planning Services' Department in Hospital General de México "Dr. Eduardo Liceaga" and other institutions were included in the study. Assessed parameters were age, time of insertion, location site, and location method. Statistical analysis was expressed as average and percentage.

Results

Hundred and sixty-four patients in whom the implant was not palpable were reviewed, the average age was 28.9 years (maximum 45 and minimum 18), the time between insertion and removal averaged 3.3 years (maximum 10 years and minimum 3 months). Three implants were inserted in the right arm, the rest on the left one. Forty-seven implants were found in fatty tissue (29%), 18 in fascia (11%), 94 in muscle (57%), 2 in the armpit (1.2%), and 3 were not found (1.8%). Previous attempts for removal were done on 48 patients (24 with 1, 18 with 2, 5 with 3, and 1 with 4 attempts). All these were located by ultrasound using linear transducers from 5 to 15 MHz bandwidth and high resolution. The total of the implants was removed, through minor surgery and two located in the armpit, through surgery with regional anesthesia; in one of these cases, the implant was next to the basilica vein. The average time of minor surgery was about 10 min.

We encountered no significant complications in our cohort following device removal.



Figure 4. Radiopaque implant. Image of the implant on the X-ray.

Discussion

Patients may want their device removed due to side effects or a wish to return to fertility. Correct insertion of the subdermal single-rod implant favors an easy removal. It should only be inserted by qualified physicians familiar with insertion and removal techniques.

The no palpable implant is caused by an incorrect insertion technique. Migration should not be assumed as a cause of difficult location, implant might usually locate in the original site of insertion.

Amount of non-palpable implants is not possible to determine due to a lack of records, but approximately 3% are considered non-palpable⁸.

Ultrasound has proven to be the study of choice to locate an incorrect inserted implant. In this case, the total number of implants was located, except in two patients in whom implant was probably not inserted, an analysis of serum etonogestrel levels is recommended^{1,5,7,9,10}.

It is important to insist on not trying to remove or surgically explore until the implant is exactly located.

Conclusions

Implant removal must be done when its lifespan is over, otherwise, it will continue to acting on the cervical mucus, thus affecting woman's fertility.

Support from trained personnel must be searched to remove the implant if a deep and fibrous capsule surrounding insertion occurs, as these make removal difficult.

Attempts to remove a non-palpable Implanon™ device blindly may lead to scarring, nerve or vessel damage, and potential medicolegal action¹¹.

Since 2012, Nexplanon® has been used with its applicator, looking to decreasing deep insertion risk. The rod also contains barium, which validates its presence through simple X-rays (Fig. 4).

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors declare that no patient data appear in this article.

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