The lost Implanon®. A practical guide to safely and quickly find and remove the implant under sonographic guidance.

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Learning objectives

Implanon® (Merck & Co, Whitehouse Station, NJ, USA) is a 4 centimeters long, 2 millimeters large rod-shaped subdermal contraceptive implant made up of ethylene vinyacetate (EVA) copolymer impregnated with 68 mg of etonogestrel. It releases its synthetic progestins over a period up to 3 years, with a very high efficiency (Cumulative Pearl Index 0 [1]). The implant has to be inserted subcutaneously into the inner side of the non dominant upper arm using a sterile disposable applicator. The appropriate position is about 8-10 centimeters above the medial epicondyle of the humerus. When inserted suitably, the implant is easily palpable in the sulcus between the triceps and biceps muscles.

At the end of its efficacy time or in case of intolerance [2], the implant has to be removed. When palpable, the removal is easy through a 2 millimeters incision, after local anesthesia.

Non-palpable implants may cause difficulties with removing. That's the reason why the apposite attitude has to be known by the practitioner confronted with such complicated situations. The aim of this exhibit is to describe the appropriate management of non-palpable Implanon® implants.

Background

Until the beginning of 2013, the inserted Implanon® implants were invisible with X-rays. The manufacturer has now added barium sulfate to the EVA copolymer core in order to improve the visibility with standard X-rays or CT. Nevertheless the vast majority of the implanted rods are at the moment only visible with ultrasound or MRI. When undetectable either with US or with MRI, etonogestrel blood levels have to be measured, to demonstrate the presence of the implant.

Detection and identification of implants with sonography has been described since many years [3-7]. The Implanon® implant has the characteristic pattern of an echogenic focus producing a posterior acoustic shadow (Figure 1). Specific settings of the ultrasound machine, as cancelling of all image improvement processing (multiple focusing, image compounding, adaptive post-processing) or positioning of the focus in the near field are mandatory [7] (Video 2). It's obvious that a high-frequency linear array transducer has to be used.
Fig. 1: Transverse view through the medial aspect of the upper arm shows an Implanon® implant as an echogenic focus producing a posterior acoustic shadow.
Fig. 2: US detection of the implant
Findings and procedure details

After the sonographic localization of the implant, several removal techniques have been proposed. Most frequently, the authors have described a surgical removal during a second session after US-guided skin marking [3, 8, 9]. These procedures required large incisions and frequently general anesthesia.

Removal under local anesthesia during the same session as ultrasound localization has been described by Persaud et al [10]. This technique required careful immobilization of the arm between localization and removal. The incision needed was wider than one centimeter. A technique of localization with a hook-wire marker has recently been proposed [11]. This technique performed under local anesthesia usually required 2 millimeters incisions but a larger one was necessary in one case.

We employ a technique inspired by the one described by James and Trenery in 2006 [4]. With this technique, localization and removal are performed during the same outpatient session under local anesthesia. Unlike James and Trenery [4], we perform the incision above the distal part of the Implanon® and use two pairs of forceps, without any needle to stabilize the implant. We use an iU22 ultrasound (Philips. Best, Netherlands) with a linear 5-17 MHz broadband transducer.

Since 2008, we have successfully removed 39 non-palpable implants in 40 women (mean age 35 years, range 21-50), even when the implant was placed intramuscular (Figure 3), close to vessels (Figure 4) or nerves. In one case, the implant was not identifiable with ultrasound. Blood level measurement of etonogestrel concluded to the absence of implant.

Once the Implanon® implant has been localized, we temporary tattoo the skin by pushing the extremity of a screwdriver 3-4 millimeters above the distal end of the implant (Figure 5). This mark has the advantage to remain after cleaning of ultrasound gel and application of disinfectant (Figure 6).

For the extraction of the implant we need local anesthetic (5 ml Xylocaine 2%), 10 ml syringe, one 30 G needle, one scalpel blade, some compresses and two pairs of curved mosquito forceps (Figure 7). An aseptic technique is used.

As soon as the skin is disinfected, one milliliter of Xylocaine is injected subcutaneously using the screwdriver mark as landmark. Sterile fields are placed and the transducer wrapped in a sterile cover.
Local anesthetic injection is repeated, this time under US guidance. The transducer is placed perpendicularly to the implant. The tip of the 30 G needle grazes one after the other both sides of the rod (Video 8). A 4-5 millimeters incision is then made longitudinally over the distal end of the implant. The blade is sonographically guided as far as the rod, and successively moved over both sides (Figure 9). The first forceps is inserted through the incision, opened and closed in order to pinch the rod. The implant is gently lifted up and palpated under the skin with the finger. The second forceps is placed for a better grip (Video 10). Then the subcutaneous tissue and fascia are opened using the blade and blunt dissection. The extremity of the Implanon® is exposed and grabbed using the forceps (Video 11). The Implanon® is then carefully pulled out (Figures 12 and 13). The incision is closed with sticking plaster (Figure 14). A pressure bandage with sterile gauze is placed for at least 6 hours.

Images for this section:

**Fig. 3:** Transverse view demonstrates the implant placed below the fascia of the biceps muscle.
**Fig. 4:** Transverse view shows the implant placed close to the brachial vein (color coded in blue).
Fig. 5: Under ultrasound control, the extremity of a screwdriver is placed 3-4 millimeters above the distal end of the implant and pushed down to the skin.
Fig. 6: The mark remains visible on the skin (arrows).
Fig. 7: Material required for removal: 10 ml syringe for anesthetic, 30 G needle, sharp scalpel blade, compresses and pairs of curved mosquito forceps.
Fig. 8: US-guided local anesthesia.
Fig. 9: US-guided skin incision and release of the rod tip.
Fig. 10: US-guided grip of the rod.
Fig. 11: Blunt dissection of the subcutaneous tissue and fascia. The extremity of the Implanon® is exposed and grabbed using the forceps
Fig. 12: Removal of the Implanon® through the narrow incision.
Fig. 13: The Implanon® is carefully pulled out.
Fig. 14: Skin closure with sticking plaster.
Conclusion

An accurate setting of the ultrasound machine is mandatory to identify the non-palpable implant. A good knowledge of the ultrasound guided removal procedure permits a quick and safe pull out of the implant under local anesthesia, with a minimal scar.

Personal information

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