How to remove impalpable Implanon® implants

Martyn Walling

Introduction

Implanon® is a contraceptive implant marketed by Organon, which was introduced to the UK in 1999. It has become popular because of its lasting contraceptive effect for up to 3 years. The correct position for the implant is one-third of the distance from the elbow to the axilla, in the non-dominant arm. Removal of the subcutaneous implant is straightforward providing insertion has been done correctly. It is essential that after insertion the practitioner and the patient should be able to feel the implant because an impalpable device can be difficult to find and remove. Impalpable Implanon can occur after incorrect insertion, non-insertion or could be due to significant weight gain. Attempts to remove an impalpable Implanon device without locating it first could cause scarring, nerve and blood vessel damage, which could, in turn, lead to medico-legal action. Organon and the Faculty of Family Planning and Reproductive Health Care (FFPRHC) have jointly developed an Implanon training programme detailing the correct insertion procedure, and the patient information sheet recommends that only practitioners who have received such training should insert the device. A theory course is followed by model arm training, demonstration of and, finally, supervision of insertion and removal of the device in a number of cases. When introduced correctly, the Implanon device lies subcutaneously between the biceps and triceps muscles. About 1 in 1000 implants are not palpable and these are classed as deep implants.[1] They usually lie below fascia and sometimes into the muscle.

Implanon is not radio-opaque but can be visualised by ultrasound or magnetic resonance imaging[1,2] and experience is gradually accumulating with the use of these techniques[1,3] for locating impalpable rods. Piessens *et al*.[2] have recently published a study reporting on the successful use of ultrasound in a series of such cases. Previously, only individual case reports were available in the literature.[3] This paper describes the author's personal experience of 31 such cases over the past 5 years and the technique based on ultrasound which he uses to remove these deep implants.

Methods

History taking

A full history is first taken to make sure that an Implanon was in fact inserted. There have been a number of documented cases in which the rods were not inserted but left in the introducer. It is, therefore, important to ask whether the patient was able to feel the Implanon after it had been inserted and what have been her subsequent bleeding patterns. In some cases, patient serum etonorgestrel levels have been measured to ensure that an Implanon had been inserted.[4]

Locating the Implanon

The ultrasound must be of minimum 10 Hz power and the probe should be placed at right angles to the plane of the Implanon. The best place to start looking is at the scar marking the site of insertion.

When correctly introduced, the proximal end of an Implanon should be about 1 cm away from the insertion scar. In a number of cases of faulty placement, the implant is pushed out of the trochar and takes the path of least resistance. This results in the implant going deep, often below fascia. If the implant cannot be located around the insertion scar then the ultrasound probe should be moved one Implanon length up the arm.

Once the Implanon has been located in this way it should be exactly marked. The Implanon shadow should be kept in the centre of the screen monitor. The upper and lower ends of the Implanon should then be marked on the skin with a marker pen. This ultrasound-guided marking is probably the most important part of the whole procedure. Failure to make the exploring incision immediately above the Implanon accounts for most cases of failed removal. It is also essential that after the marking of the skin, the arm must not be moved.

Theatre technique for surgical removal of a deep Implanon

With the patient on the table in the supine position, the arm is placed onto a secure arm board with a waterproof pillow under the arm to include the axilla. This is essential to assist the patient in keeping perfectly still during the procedure. In most cases the Implanon is below the fascia so it is essential to employ aseptic technique. The use of a gamma-irradiated sterile composite pack with disposable drapes is the best method (Table 1).

Once the ultrasound location and skin marking have been done, a scrub nurse can prepare the operation site and set the sterile field. The surgeon then scrubs and draws up and injects local anaesthetic. For skin closure, mattress stitches are used to close dead space, although Mascarenas does not recommend these.[5] A scrub assistant follows the incision with retractors to help visualise the implant and to help with location.

Table 1 *Equipment required for Implanon® removal*

Equipment	Item	Quantity
Contents:	Adhesive aperture drape	1
	Raytec swabs 7.5 × 7.5 cm	5
	Dressing swabs	5
	Plastic tray with two integral galley posts	1
	Sterile syringe 5 ml	1
	Green needle for drawing up	1
	Orange needle	1
	Blade Bard Parker No. 10 or 11 (or single-use scalpel)	1
Instrumentation:	Bard Parker Handle No. 3	1
	Forceps Sponge Holding Rampley	2
	Forceps Vas Holding	2
	Forceps Dissecting Adson Thd 1:2	1
	Forceps Dissecting Adson Plain	1
	Scissor Metzenbaum 12.5 cm	1
	Forceps Haemostatic Halstead Mosquito	3
	Retractor Langenbeck (Baby)	2
	Retractor Langenbeck (Standard)	2
	Scissor Stitch Cutting	1
	Holder Needle Mayo Oschner	1
	3/0 Ethilon skin suture	?
Have available:	1% Lignocaine with adrenaline	
	Skin antiseptic	
	Kling bandage for dressing	

J Fam Plann Reprod Health Care 2005; **31**(4): 320–321

Parkside Surgery, Boston, UK
Martyn Walling, FRCGP, FFFP, *General Practitioner*

Correspondence to: Dr Martyn Walling, Parkside Surgery, Tawney Street, Boston, Lincolnshire PE21 6PF, UK. Tel: +44 (0) 1205 365881. E-mail: martyn@belmontdoc.freeserve.co.uk

Table 2 *Key points to note regarding Implanon® removal*

- When encountering difficulty removing an Implanon use ultrasound (minimum 10 Hz power).
- After ultrasound location, mark the upper and lower ends of the Implanon on the skin.
- Ensure the arm is not moved after this stage.
- Proceed slowly, checking the position of the Implanon at all times by palpation.
- Take particular care if the Implanon has been incorrectly placed too far up the arm, near the axilla.
- The key to these problems lies in prevention, by using the correct insertion technique. Proper placement of the implant is more likely if the practitioner has undergone a training programme as specified by the FFPRHC.

Removal is usually fairly straightforward. The ultrasound will give a guide as to whether there are any other structures near the Implanon. Provided the Implanon has been inserted one-third of the way up the arm, even though it may be below the fascia and in muscle, removal is usually not a problem. The biggest difficulty occurs when the Implanon is inserted too high up in the arm. This is when veins may come into play. Exactly where the incision is made depends on the surrounding structures. Ultrasound will detect how close the Implanon is to the skin and the first attempts at removal should always be where it is most superficial. Occasionally, an Implanon will have been incorrectly inserted at quite an acute angle into the arm with the distal end deep.

The recommended local anaesthetic is 1% lignocaine with adrenaline for a bloodless field. About 2 ml is needed, divided between skin and below the fascia. An incision is then made longitudinally, slightly wider than the diameter of the small finger of the operator, so that the finger can be introduced to check the position of the Implanon by touch. After the skin incision, the subcutaneous tissue and fat are separated by blunt dissection down to the fascia. Skin retractors are then inserted and the fascia is opened using forceps scissors and blunt dissection. At all stages the little finger is used to check the position of the Implanon. When the Implanon is in muscle it can be quite difficult still to feel until below the fascia. If it is in muscle, again blunt dissection is used, and eventually the Implanon will be seen and it can be grabbed using the modified vasectomy forceps. The incision is closed with either mattress suturing or subcuticular suturing. The key points to note regarding Implanon removal are summarised in Table 2.

Discussion

The author has to date removed 31 impalpable Implanon devices using this technique, which has proved safe, practical and does not require a general anaesthetic. He has not (yet) failed to remove any Implanon devices that have been referred to him. In the majority of these cases, attempts at removal had already been made either by general practitioners, consultant gynaecologists, consultant surgeons or consultant orthopaedic surgeons.

Implanon devices do not migrate to these deep positions. They can only shift along the insertion track and this can only happen in the first hours following insertion. The implants that the author has removed have evidently been poorly inserted and this suggests that the training programme advocated by the FFPRHC should be mandatory. It is unreasonable to blame the product for these removal problems. Merki Feld *et al*. also emphasise this point.[4]

Statements on funding and competing interests
Funding. None identified.
Competing interests. None identified.

References
1 Details supplied by Organon on the number of cases reported.
2 Piessens SG, Pamer DC, Sampson AJ. Ultrasound localisation of non-palpable Implanon. *Aust N Z J Obstet Gynaecol* 2005; **45**: 112–116.
3 Westerway SC, Picker R, Christie J. Implanon implant detection with ultrasound and magnetic resonance imaging. *Aust N Z J Obstet Gynaecol* 2003; **43**: 346–350.
4 Merki-Feld GS, Brekenfeld C, Migge B, Keller PJ. Nonpalpable ultrasonographically not detectable Implanon rods can be localized by magnetic resonance imaging. *Contraception* 2001; **63**: 325–328.
5 Mascarenhas L. Insertion and removal of Implanon: practical considerations. *Eur J Contracept Reprod Health Care* 2000; **5**(Suppl. 2): 29–34.

Journal Review

Ectopic pregnancies and reproductive capacity after *Chlamydia trachomatis* positive and negative test results: a historical follow-up study. Andersen B, Ostergaard L, Puho E, Skriver MV, Schonheyder HC. *Sex Transm Dis* 2005; **32**: 377–381

Female patients diagnosed and treated for chlamydial infection frequently ask about the implications for their future reproductive capacity. One of the issues with screening asymptomatic women is whether early diagnosis and treatment is beneficial. The aim of this Danish study was to investigate reproductive outcomes in women after chlamydia testing. The study was historical, using health registers for hospital discharges and a database of women tested for *Chlamydia trachomatis* between 1984 and 1993.

The authors correctly identify several sources of bias in their discussion. However, they do not identify that a source of bias is that the cohort of women screened includes a mixed group; symptomatic women, asymptomatic women, contacts of men with infection and women screened prior to a transcervical procedure [abortion, intrauterine device (IUD) insertion and hysterosalpingography]. This means that within their cohort women may have other conditions that affect fertility, namely symptomatic pelvic infection, abortion and IUD insertion in the presence of *C. trachomatis*. The group of women attending for hysterosalpingography are presumably attending for investigation of their subfertility! The reasons for attendance are not documented so one cannot determine which of these groups dominates the cohort studied. The focus of the study is future first pregnancy; however, the reasons for this are unclear, especially as they include women who are tested prior to an abortion. Another concern is that the study is based on enzyme-linked immunosorbent assay (ELISA) testing (sensitivity 50–60%), and not the more sensitive nucleic acid amplification tests such as polymerase chain reaction, so there is an increased likelihood of false-negative test results. There is also no information on previous chlamydial infection, previous pelvic inflammatory disease (PID), sexual behaviours and condom use, how the women with positive results were treated, and whether partner notification and effective treatment occurred.

So, does this study enable us to give an informed answer to women with a positive chlamydia test result? The good news is that in this study, women with positive chlamydia ELISA results (n = 1882) had no significant delay in giving birth, or an increase in ectopic pregnancy rates when compared with the women with negative chlamydia results (n = 11 811). The bad news is that the study design has introduced bias and confounding and so does not provide evidence to enable us to confidently reassure women about future fertility. There is evidence from previous observational studies and one randomised controlled trial on selective screening done in the USA that *C. trachomatis* screening reduces the risk of PID and consequently ectopic pregnancy over time. I am not aware of such evidence with regard to future fertility including all pregnancy outcomes.

Reviewed by **Helen Mitchell,** FRCOG, DFFP
Consultant in Sexual and Reproductive Health, Mortimer Market Centre, London, UK

Female reproductive history and the skeleton: a review. Karlsson MK, Ahlborg HG, Karlsson *C. Br J Obstet Gynaecol* 2005; **112**: 851–856

The loss of bone density associated with Depo-Provera® is sometimes balanced against the effect of pregnancy on bone. During pregnancy and lactation there is a reduction in bone mineral density (BMD) of up to 5%. However, the effect is transient and it would appear from this review that pregnancy and lactation do not adversely affect BMD or fracture risk in the long term.

A number of studies have shown that parous women and those with a long period of lactation have no different, or lower, fracture risk than their nulliparous peers. Studies looking at the effect of lactation have not shown any greater risk of fracture in women who breastfed compared to those who bottle-fed. In fact several studies have demonstrated higher BMD and significant reduction in fracture risk with increasing parity. The reason is unknown but may be partly due to lifestyle factors.

Reviewed by **Louise Melvin,** MRCOG, DFFP
Specialist Registrar, Simpson's Centre for Reproductive Health, Edinburgh, UK