The challenges of location and removal of Implanon® contraceptive implants

Ian S Fraser

Background
The single-rod, subdermal, implant system, Implanon® (Organon), has justifiable popularity amongst many women as a long-acting hormonal contraceptive delivery system with a number of positive attributes. For many, the appeal of the long-acting, high efficacy and convenience greatly outweigh the inconvenience of a minor surgical insertion procedure and the possibility of nuisance value or troublesome breakthrough bleeding.

One of the main disadvantages, which rarely impacts on the decision to start the method, is that the device requires a surgical procedure for removal. Fortunately, this is usually simple, minor, quick, safe and undertaken with the injection of only a small volume of local anaesthetic. Occasionally, removal may be difficult, or even extremely difficult, and there are a number of possible reasons for this (Table 1).

Implant positioning and insertion
Removal is rarely difficult if the implant has been correctly positioned superficially in the subdermal layer of the skin of the inner aspect of the non-dominant upper arm, and can be easily palpated. Attention to detail on positioning of the device at insertion is critical, and no health professional should embark on an insertion procedure without completing an approved training programme, such as the Faculty of Family Planning and Reproductive Health Care Letter of Competence in Subdermal Contraceptive Implant Techniques. The procedure looks easy when performed by an expert, but errors at insertion are the basis of almost all difficult removals.

The manufacturer recommends insertion over the groove between the biceps and triceps muscles of the non-dominant arm, about 7 cm above the medial epicondyle of the humerus. However, many experienced family planners insert the device somewhat more anteriorly along the medial surface of the biceps, or posteriorly over the medial surface of the triceps, away from major vessels and nerves. Hundreds of thousands of Implanon implants have been inserted worldwide, with only a few cases reported of removal difficulties.

Factors influencing the difficulty of removal of subdermal contraceptive implants

Table 1 Factors influencing the difficulty of removal of subdermal contraceptive implants

<table>
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<th>Reason for Possible Difficulty in Implanon Removal</th>
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Inexperienced or untrained operator
Deep-angled insertion
Insertion among brachial vessels and nerves
Deep subdermal insertion – just palpable or impalpable
Superficial subdermal insertion in an unusual position
Inexperienced or untrained operator
Implant impalpable due to failure of insertion or previous removal
Migration of implant
Fibrous capsule around implant
Operator inexperienced or untrained in implant removal
Previous unsuccessful attempts at removal and subsequent scarring
acoustic shadowing deep to the implant and by the appearance of the implant itself as a bright dot or line.4,17,19 The exact positioning should be marked on the skin and the depth, in subcutaneous fat or muscle, recorded.

Occasionally, ultrasound imaging fails to locate an impalpable implant. In most of these cases there has probably been a failure of initial insertion of the implant,4,20 and this can be confirmed by measurement of serum levels of etonogestrel by arrangement with the manufacturer, Organon. Spontaneous expulsion of a device after correct insertion must be close to impossible, but rare anecdotal cases of manipulation and extrusion of the device by the patient soon after insertion have been recorded.21 Such manipulation of the correctly inserted device (some patients report ‘playing’ with the easily palpable superficial device) may be the 1.5–2.0 cm skin incision with progressive, gentle blunt dissection until the implant can be palpated and then visually identified.4 This can usually be accomplished using local analgesia, but potentially difficult cases may be performed under general anaesthesia according to the preference of the individual surgeon. Occasionally, fibrous tissue around the implant may complicate the dissection.6 Other techniques have been described, including the use of modified vasectomy forceps with guidance from real-time ultrasound,3 although I personally prefer to visually identify the deep implant before removal. Clearly, special care needs to be taken when a deeply inserted implant is close to the brachial and ulnar neurovascular bundle.3,7,8

Issues of risk management and possible remediation are also raised when an incorrect insertion results in a difficult removal. It is my opinion that the practitioner undertaking a difficult removal should provide a report to the appropriate senior medical officer in the unit where the original insertion was carried out, even though the insertion may have been done 3 years previously.

Conclusions

Over the past few years, this Journal has published an increasing number of articles and case reports highlighting the potential problems that may arise during subdermal contraceptive implant removal, including the single-rod implant, Implanon. It is clear that all family planning providers must be thoroughly familiar with the potential pitfalls of implant insertion and removal, with the techniques for implant detection, and with the requirement that these procedures must not be undertaken without appropriate training. Health professionals who only undertake insertions – and not removals – must nevertheless thoroughly understand the principles of removal and the complications that may occur after deep insertion. Consideration should be given to referral of all women with impalpable implants to a specialist unit with specific experience in these difficult procedures when removal is required.

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References


Editor’s Note

Interested readers should note that four of the articles/case reports cited by the author in this Commentary article appear in this issue of the Journal.
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