

Table 1 Case reports of perforations with the GyneFix device to date

Year	Authors	Time until removal	Mode of presentation	Previous progestogen used
1996	Vekemans and Verougstraete ⁴	10 weeks	Pain	None stated
2000	Al-Kamil ²	12 days	Pain	Norplant (4 years)
2001	Reuter and Krishnamurthy ¹	5 months	Cramps and pain	Depo-Provera
2001	Gandhi et al. ³	11 days	Pain	Progestogen-only pill
2001	Gandhi et al. ³	3 months	Pregnancy	None stated
2002	Aust et al.	2 months	Strings not visible	Depo-Provera

suspicion of perforation but in our case the perforation was asymptomatic and only the request to have the GyneFix removed allowed the diagnosis to be made.

Unlike most IUDs the GyneFix has to be anchored by penetrating a knot into the uterine muscle. It is possible that uterine hypoplasia after long-term progestogens could make these patients more prone to perforation with this particular device. A representative of the company that developed the GyneFix has suggested that the likely mechanism of perforation is that the anchoring knot is placed on the serosal surface of the uterus at the time of insertion and the device is pulled into the abdominal cavity by bowel action.⁵ However, any theory on the mechanism of perforation can only be conjecture.

The design of the introducer was altered in 2001 to make GyneFix insertion a one-handed procedure, thereby freeing the other hand to provide traction on the tenaculum. This alteration was to make insertion easier and, it could be argued, to make perforation less likely. It is impossible to

say which version of introducer was used in the previous cases (although they are likely to have been the older model) but one of the new introducers was used in the present case.

The GyneFix has been found to be a well-accepted form of non-hormonal contraception.⁶ Routine ultrasound scanning of all patients undergoing GyneFix insertion would be impractical and would impede the convenience and acceptability of this device. However, one has to question whether a history of prolonged amenorrhoea should prompt caution or the assessment of fundal myometrial thickness before insertion. This is especially important as perforation may be difficult to diagnose and may only present when the patient becomes pregnant.

Statements on funding and competing interests

Funding. None identified.

Competing Interests. None identified.

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The impalpable Implanon®: a case report

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Abstract

This is a case report of an Implanon® contraceptive device that was impalpable after insertion and a discussion of the management of the impalpable Implanon.

Case report

A 16-year-old girl currently using Depo-Provera® for contraception attended the family planning clinic with a view to a change of contraceptive method because of weight gain on Depo-Provera. She was informed of her contraceptive options and in particular the contraceptive implant, Implanon. Implanon is a single-rod, non-biodegradable, contraceptive implant containing 68 mg etonogestrel. The mode of action, insertion and removal method and side effects including menstrual disturbance were fully explained to her. She consented to insertion. Implanon was inserted using the standard method into the medial side of her right arm, 8 cm above the elbow in the biceps/triceps groove.¹

After insertion the implant was impalpable. The patient was informed that it was possible that the implant was too deep to palpate or perhaps had not left the loading system. She was protected from pregnancy by her still active Depo-Provera.

An ultrasound of the patient's upper arm failed to detect the implant. X-ray was not utilised as Implanon is not radio-opaque. As the ultrasound department was not familiar with ultrasound use in the location of Implanon and deep insertion could not be confidently excluded, a magnetic resonance imaging (MRI) scan was recommended.

In the meantime a further Implanon was inserted, with the patient still under contraceptive cover from the Depo-Provera.

The MRI scan revealed a single device in the subcutaneous fat. Localisation was aided by placing an oil capsule on the skin, at the site of insertion. A surface coil is necessary for the best image quality.

Figure 1 shows the Implanon in axial section, as a low signal (black) structure, or signal void, just beneath the skin, with surrounding high signal (white) rim. Higher signal from the adjacent subcutaneous fat acts as contrast. Figure 2 is a coronal section using a fat suppression sequence (STIR). The Implanon has a low signal, and would be lost against the background low signal of subcutaneous fat, but is highlighted by a ragged high signal rim. This high signal represents the oedema following insertion, which persists for several days.

The patient was informed that she did only have one



Figure 1 An MRI T1 axial image showing the Implanon as a signal void in the subcutaneous tissues, deep to an oil capsule taped to the skin surface at the site of insertion. Note the high signal rim surrounding the device

Implanon in situ and that the first device had never reached her arm during insertion.

Five months later the patient no longer had a need for contraception and had polymenorrhoea, menstrual cycle 7/14, and the Implanon was removed at her request.

Discussion

This is the second case of an Implanon 'lost' at the time of insertion seen within our department. An Implanon may be impalpable because of failed insertion technique (non-insertion), deep insertion or, very rarely, because of migration from the insertion site. If at any point after insertion an Implanon is impalpable after careful palpation of the insertion site feeling for the proximal and distal ends of the device, deep into the biceps/triceps groove and muscle bulk then alternative contraception should be recommended.

Ultrasound has been proposed as the investigation of choice.² High or very high frequency transducers provide good resolution³ and are most effective at detecting Implanon. Implanon may first be located by its distinct acoustic shadow and its exact position identified as an echogenic spot. Once the Implanon has been located a longitudinal view will allow both tips to be located. However, our experience suggests that ultrasound localisation is only practical when the device is lying very superficially. If the Implanon is deep in the muscle or soft tissue it may be difficult to identify, since the diameter of the rod is close to the resolution of the ultrasound probe.

MRI is suggested, as a second-line imaging modality, although its use will be restricted in some areas because of cost and access. Implanon is not detectable by computed tomography scanning. Implanon produces low signal or a signal void on MRI and therefore is seen as a dark area against adjacent structures. Sequences that enhance the signal return from fat and muscle will help to differentiate Implanon from surrounding tissues. If an Implanon is inserted deep into muscle it may be difficult to detect because of poor tissue differentiation.

In this case the correctly placed Implanon was easily palpated and clearly seen on MRI. It is presumed that the first Implanon failed to leave the loading device.



Figure 2 An MRI coronal, fat suppression (STIR) sequence shows the Implanon as a long, thin structure, with surrounding ragged area of high signal representing the oedema and inflammation at the injection site

It is crucially important during the insertion of an Implanon device that the cannula is tapped to ensure that the implant is well within the introducer. After insertion both patient and inserter should confirm that the Implanon is palpable in the arm. The introducer should be checked to ensure that it is emptied. If the Implanon is not palpable this may be due to failed insertion, deep insertion or, very rarely, migration of the device. Migration has been reported in Implanon trials following pushing during the insertion procedure.

Ultrasound imaging using a linear high-frequency probe preferably by an experienced ultrasonographer may detect an impalpable Implanon.

If ultrasound imaging is not available then serum etonogestrel levels (via Organon) will confirm that an Implanon is in situ but will not localise its position. MRI may be used as a second-line imaging method.

Since it is coming up to 3 years since the first Implanon devices were inserted, women will now be returning to have them removed. Some women will have an impalpable Implanon; by close liaison between radiology departments and clinicians most Implanon devices will be localised by a combination of ultrasound and MRI scanning techniques.

Only a careful insertion technique and confirmatory palpation of the implant by patient and inserter will prevent Implanon insertion and removal difficulties.

Statements on funding and competing interests

Funding. None identified.

Competing interests. Dr Searle has received payment for delivering training sessions on Implanon insertion. Dr Stillwell has received funding from Organon to attend scientific meetings and to deliver training sessions on Implanon insertion.

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