CASE REPORT

Implantable contraceptive devices: *primum non nocere*

Thomas W H Bragg, Rajive M Jose, John W Bland, Richard N Matthews, Shekhar Srivastava

**Introduction**

Long-term implantable contraceptive devices have been available for a number of years. They are particularly suited to patients who are sensitive to the relatively high levels of oestrogen associated with other forms of contraception and those who have had difficulty with other contraceptive methods. With an average annual pregnancy rate over 5 years of less than 0.1%, such systems are extensively employed worldwide.

The first such system was Norplant®, offering women the versatility of a reversible, 5-year, low-dose, progestogen-only contraceptive. The six levonorgestrel-impregnated silastic tubules were inserted subcutaneously in the lower medial aspect of the patient’s upper arm. Each capsule was 2.5 mm in diameter and 34 mm in length and contained 36 mg of the progestogen.

Distribution of Norplant was discontinued in October 1999 as a commercial decision, influenced by the rising tide of litigation mainly associated with injuries incurred during removal. It has been superseded by Implanon®. The newer preparation differs by containing 68 mg etonogestrel in a single flexible rod and lasts up to 3 years. In common with Norplant this device is inserted 7 cm proximal to the medial epicondyle, on the medial aspect of the upper arm. Any Norplant systems still in place should have been removed by the end of 2004.

Although some women with Norplants in situ are still coming into the UK from abroad (J Bland, personal observation). We report the present case with suggestions for safer sites for implantation.

**Case report**

A 38-year-old, right-handed saleswoman was referred to a plastic surgery department from her general practitioner (GP) after she underwent unsuccessful exploration of her left medial arm for removal of Norplant implants inserted 8 years previously. She initially underwent exploration at her GP’s surgery. He was unable to remove the implants and referred the patient to a family planning centre. She had had a difficult removal of previous implants at the same site. Exploration and removal was performed under local anaesthesia without a tourniquet by a doctor. Only four rods were palpable subcutaneously and were deep. The patient was advised that the four rods would be removed but if the others could not be found she would require general anaesthesia without a tourniquet by a doctor. Only four rods were palpable subcutaneously and were deep. The patient was advised that the four rods would be removed but if the others could not be found she would require general anaesthesia.

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**Discussion**

Patients considering contraception in the form of implants are often concerned by such factors as ease of insertion and a concealed scar. The ideal site would also allow for ease of removal and contain enough subdermal fat to avoid skin blistering, but not so much as to permit migration. Insertion sites such as the abdomen, buttocks and upper leg are more likely to result in complex removals due to implant migration in the subcutaneous planes, risking damage to important nerves. Accordingly, the manufacturers were advised that the lower medial aspect of the upper arm fulfilled these characteristics, with a more predictable depth of subcutaneous fat and a low rate of migration.

The attractiveness of this site for implantation of contraceptive devices is due to its easy accessibility and a cosmetically concealed scar. However, as shown by this case report, it is an area of questionable safety. As can be seen in Figure 1, insertion at this site may jeopardise a number of neurovascular structures. A simple analysis of the anatomy of this region alerts one to the close proximity of important structures. The neurovascular bundle starts deep in the proximal upper arm (Figure 1a), becoming progressively more superficial distally. In this area (Figure 1b) there are two important structures in the subcutaneous plane, namely the ulnar nerve and the medial cutaneous nerve of the forearm. The medial cutaneous nerve of the forearm lies alongside the basilic vein in the groove between the biceps and the triceps. Under the fascia between the muscles lies the brachial artery. It is important to consider that dissection deep to the deep fascia should never be necessary since subcutaneously implanted devices rarely migrate beneath it. This analysis leads us to caution clinicians in the use of the medial arm at any site distal to the midpoint of the humerus.

The vast majority of implants are palpable. In such cases the implant is removed by injecting local anaesthetic below it, making an appropriate incision and then grasping it with blunt forceps and pulling it out of the incision in a ‘U’ or ‘pop-out’ technique. Older implants may be encased in fibrous tissue, which may be parted by blunt dissection or by an upturned knife, avoiding cutting into the rod itself.
If the device is not palpable subcutaneously then imaging techniques should be used to locate it prior to exploration.\textsuperscript{13} It should be noted that Implanon is not radio-opaque and that it is not detectable by computed tomography scanning. The current literature suggests a number of conventional and some novel imaging techniques. The manufacturers advocate the use of either ultrasound (7 MHz) or a compression mammography technique that has been reported for location of Norplant.\textsuperscript{13,14} The use of a very high frequency ultrasound transducer (13.5 MHz) for the location of Implanon has been reported.\textsuperscript{15} If the device is deep in the muscle or soft tissue it may be difficult to identify by ultrasound since the diameter of the rod is close to the resolution of the ultrasound probe. High-resolution fluoroscopy with associated digital subtraction has been used to achieve satisfactory imaging of Norplant and of complex local anatomy.\textsuperscript{15} Current consensus in the UK advocates magnetic resonance imaging (MRI) that allows for high-resolution three-dimensional imaging of intricate anatomy.\textsuperscript{16} The authors accept that this modality may be limited to second-line use because of cost and restricted access to facilities. The implant produces a low signal or signal void on MRI and is seen as a dark area.\textsuperscript{17} The introduction of radiopaque markers into each end of the Implanon has the advantage that an arm tourniquet can be used should explore be necessary. Unfortunately some patients may not find this site acceptable due to its only semi-concealed access.\textsuperscript{18} The anteromedial site has the advantage of not putting the median nerve and brachial artery at risk. The anteromedial site has the advantage of not immediately endangering any structures, with a keloid risk no greater than over the medial aspect. This site has the added advantage that an arm tourniquet can be used should exploration be necessary. Unfortunately some patients may not find this site acceptable due to its only semi-concealed position. Other patients may be happy with devices implanted in more exposed but safe positions such as posteriorly over triceps, anteriorly over biceps or in the deltoid area. We would, however, caution clinicians against using the deltoid area due to the incidence of fat atrophy and keloid noted at this exposed site (A L H Moss, personal communication).

We strongly advocate that the common clinical practice should be modified from insertion distally on the inner arm to a position proximal to the midpoint of the humerus on the medial aspect.

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\textbf{Funding.} None identified.

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\textbf{References}

CASE REPORT/VIEW FROM PRIMARY CARE


“30 Love”

Lar Diass

So, all I have to do is keep a list of the fatties in my practice and there’s eight QOF (Quality and Outcomes Framework) points to be had. That’s easy. I can do that on the top of my head. To start with, there’s Mr Tubbs who broke the chair in the waiting room – we’re still waiting to hear from our lawyers as to who’s liable. Then there’s young Thomas who just turned sixteen and came to see me with computer game thumb, and yesterday Ms Delight who thought that being overweight made you infertile but is now on her way to the antenatal booking clinic. Shouldn’t be difficult to get the rest of the register completed; although when my larger patients waddle up to me in the supermarket and I’ve no recollection of what they came to see me about, I can certainly remember whether their flanks rub up against both sides of the checkout aisle or not. Plus, like all staff, ours are always gossiping about how much weight so and so has put on.

I guess we are going to have to do it properly if we’re not going to be slammed by the QOF reviewers. Apparently, some practices are providing patients with a private room where they can record their weight and blood pressure and input it onto the computer themselves. Saves time for the GP and the nurse, makes a patient feel empowered, and so on, but can you trust them to do this honestly? Can you hell! Come on, be realistic. You ask how much someone drinks and they underestimate it; ask them if they smoke and through stained teeth they reply “only much someone drinks and they underestimate it; ask them if they smoke and through stained teeth they reply “only” so have to learn something about it. men, well, men are men. Result, she’s become a two-for-one deal, like the offer she’s so fond of at the supermarket that she blames for putting her in this situation – it’s never the individual’s fault is it? – as she’s now joined the obesity and antenatal registers, but is still no wiser about her health.

But how will patients react when they learn about the obesity register, and that they are on it? “There’s a list. I’m on it? What do they do with it? You mean it’s on that NHS network. Oh God, that means anyone will be able to see it.”

Ms Delight’s situation is a real conundrum and highlights how, surely, we should be spending time educating our patients, rather than compiling meaningless registers. She doesn’t think she needs contraception because she’s heard that being overweight makes you infertile. More to the point she tells me: “Needing contraception would be a fine thing but it’s not likely when I look like this doctor, is it?” True, being overweight can reduce a woman’s chance of falling pregnant because of a lack of ovulation, and a lack of physical appeal. She doesn’t feel attractive, and doesn’t think men find her attractive. To compensate for this she pouts out, and men, well, men are men. Result, she’s become a two-for-one deal, like the offer she’s so fond of at the supermarket that she blames for putting her in this situation – it’s never the individual’s fault is it? – as she’s now joined the obesity and antenatal registers, but is still no wiser about her health.

onto the message book, as they moan about not being able to lose weight. If I can figure out a way of connecting the scales to the computer then I won’t even have to enter the data. In fact, since waist measurement has been reborn as an indicator of future health problems, perhaps during our surgery remodelling we could make the doorway width the maximum safe waist width. This way, when waist circumference joins the band of merry QOF targets, we’d be ahead of the game with an effortless way of identifying our ‘wide-loads’.

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