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Etonogestrel implants

Case studies of median nerve injury following removal

The etonogestrel implant has been available in Australia since 2001. General practitioners routinely insert and remove these implants in their rooms under local anaesthetic. We report two cases of significant median nerve injury following inappropriate dissection of the arm to remove this device when impalpable. These cases illustrate the need to follow the product guidelines and to refer impalpable or deeply placed implants for imaging and subsequent removal under ultrasound guidance or by a qualified surgeon.

Keywords: contraceptive agents; female; device removal

Case study 1

A woman, 44 years of age, presented to a hand clinic in 2010 with a partial high median nerve lesion, 7 days after attempted removal of an impalpable etonogestrel implant. During the initial removal procedure she experienced a sudden shooting pain down her arm, followed by paraesthesia and dysaesthesia in her hand. The procedure was discontinued, and she attended a hospital emergency department.

Ultrasound showed the implant to be separate from the incision and in the subcutaneous plane. Its location was marked and she was referred to a hand clinic. At that stage, she had weakness of the muscles innervated by the median nerve and significant dysaesthesia and paraesthesia throughout its sensory distribution.

The wound was explored under general anaesthesia 7 days from the original procedure, and a 10% laceration of the median nerve was repaired under the operating microscope. The implant was removed through a separate incision. Four months after the injury she had persistent weakness of her thenar muscles, however, her major disability was persistent dysaesthesia and paraesthesia in her hand, which required treatment by a pain specialist.

Case study 2

A woman, 26 years of age, presented to a hand surgeon in 2008, 7 months following removal of an impalpable etonogestrel implant. The removal was unsuccessful at the first attempt in the rooms of her general practitioner, during which she reported shooting pain down her arm and subsequent paraesthesia and dysaesthesia.

The implant was removed the following day under ultrasound guidance. At 7 months, she had significant wasting of her thenar eminence; weakness of median nerve innervated forearm muscles, and significantly decreased sensation on the palm and radial three digits. Nerve conduction studies confirmed an incomplete but significant high median nerve injury and ultrasound showed a neuroma in continuity at the site of putative injury. She did not undergo surgery and her symptoms began to resolve at 2 years.

The etonogestrel implant has been available in Australia since 2001[1] and has been a useful addition to contraceptive options for women. It requires removal or replacement within 3 years and may be removed earlier, either because of side effects or for the cessation of contraception. It is routinely removed under local anaesthetic by general practitioners. The vast majority of these procedures have no negative sequelae, however, attempted removal of an impalpable implant can lead to significant complications.

Implant insertion and removal

The etonogestrel implant is a 40 mm by 2 mm white rod, consisting of an etonogestrel and ethylene vinyl acetate copolymer core with an ethylene vinyl acetate skin. A newer version of this implant, released in mid 2011, also contains barium sulphate making it visible on X-ray and computerised tomography (CT) scan.[2] It is inserted in the subcutaneous plane on the medial aspect

of the nondominant arm, 8–10 cm proximal to the medial epicondyle under local anaesthesia and should be palpable throughout its use.

Recommended removal is described in the product information,[2] and is via a small subcutaneous incision at the distal end of the palpable rod, with the rod manually pushed through the incision and grasped with forceps as it appears. Notably, no dissection is required. In the case of the rod not being palpable it is recommended that ultrasound, X-ray, CT or magnetic resonance imaging (MRI) be used to locate and remove the rod. It is a recommendation of the The Royal Australian College of General Practitioners (RACGP)[3] that doctors prescribing the implant have attended a training session in patient selection and counselling and insertion and removal techniques arranged by the manufacturer.

Anatomy

The site of insertion and removal contains a number of important structures. These include:[4]

- structures in the subcutaneous plane. The medial cutaneous nerve of the arm branches a number of times in this region and injury to one or more of these branches can result in minor paraesthesia distal to the injury
- structures deep to the investing fascia. The median and ulnar nerves, the brachial artery and the medial cutaneous nerve of the forearm are situated in this area. In women who are thin, these subfascial structures can be deceptively close to the skin.

Discussion

Previous reports of complications of etonogestrel implant removal describe one case of transient ulnar nerve sensory defect[5] and one of damage to the medial cutaneous nerve of the arm,[6] however high median nerve injury has not previously been described. High median nerve injury is debilitating and usually takes years to recover, often with some residual disability.

In both case studies described in this article, the injury was as a result of exploratory procedures to find nonpalpable implants. In one case, further exploration of the wound was possible and primary repair achieved; in the other, it was too late to attempt primary repair. The option of nerve grafting at a later presentation risks damaging both nerve fibres that have regrown, and those that are undamaged. The decision whether or not to graft presents a difficult dilemma for both the surgeon and patient.

The problems raised by the two case studies could have been prevented if the clinician involved referred to the product information,[2] which clearly states the need to image impalpable implants. Location by medical imaging may also be clinically appropriate in any case where removal is likely to be anything but straightforward, such as if the rod is palpable but appears to be deep, or if it is impalpable for some of its length. Once the rod is localised on imaging it should be removed with ultrasound guidance or the site marked and the device removed by an appropriately qualified surgeon. If a nerve injury is suspected, the patient should be referred within 7 days to a hospital hand clinic.

The RACGP patient consent form for the insertion of the etonogestrel implant[7] does not include nerve damage as a possible side effect of removal. While nerve damage is a rare side effect of removal (and in the cases described, resulted from not following the product information), if it does occur, the sequelae can be significant and debilitating. The RACGP should consider including nerve damage as a possible side effect of implant removal on its patient consent form for the insertion of the etonogestrel implant.[7]

Key points

- GPs inserting and removing etonogestrel implants in their rooms should be adequately trained and follow the technique outlined in the product information.
- Blind dissections of impalpable implants should not be attempted; impalpable implants should be referred for imaging.
- Location by medical imaging may also be clinically appropriate if the rod is palpable but appears to be deep, or if it is impalpable for some of its length.
- Once the rod is localised on imaging, it should be removed under ultrasound guidance or by a qualified surgeon.
- If a nerve injury is suspected, the patient should be referred within 7 days to a hospital hand clinic.

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