CASE REPORT

Case Report: Traumatic Incomplete Fracture of an Implanon NXT® Contraceptive Implant

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Abstract

The etonogestrel (ENG) subdermal contraceptive implant (Implanon NXT®) is a safe and highly effective method of contraception which is increasing in popularity globally. This case report describes a 26-year-old woman who requested removal of the Implanon NXT® contraceptive implant. She reported that her implant had bent following direct trauma. The implant was removed in accordance with her request and without complication, but was noted to be incompletely fractured. We compare this case with a summary of the existing literature on fractured or damaged contraceptive implants. Structural damage detected whilst the implant is *in situ* is one potential complication of contraceptive implant use. The incidence of this complication and the implications for contraceptive efficacy are unknown. Damaged implants may present healthcare providers with more technically challenging "difficult removals". With the scale-up of services for implant provision, consideration should be given to this issue in order to inform counselling and removal services. *(Afr J Reprod Health 2019; 23[4]: 124-128).*

Keywords: Contraception, contraceptive implant, implant removal, fractured implant, Implanon NXT®

Résumé

L'implant contraceptif sous-cutané étonogestrel (ENG) (Implanon NXT®) est une méthode de contraception sûre et très efficace qui gagne en popularité dans le monde entier. Ce rapport de cas décrit une femme de 26 ans qui a demandé le retrait de l'implant contraceptif du type Implanon NXT®. Elle a signalé que son implant s'était plié à la suite d'un traumatisme direct. L'implant a été retiré conformément à sa demande et sans complication, mais il a été noté qu'il était incomplètement fracturé. Nous comparons ce cas avec un résumé de la documentation existante sur les implants contraceptifs fracturés ou endommagés. Les dommages structuraux détectés lorsque l'implant est *in situ* sont une complication potentielle de l'utilisation d'implants contraceptifs. L'incidence de cette complication et les implications pour l'efficacité contraceptive sont inconnues. Les implants endommagés peuvent présenter aux prestataires de soins de santé des «déménagements difficiles» plus difficiles sur le plan technique. Avec l'intensification des services de fourniture d'implants, il convient de tenir compte de cette question afin d'informer les services de conseil et de retrait. *(Afr J Reprod Health 2019; 23[4]: 124-128).*

Mots-clés: Contraception, implant contraceptif, retrait d'implant, implant fracturé, Implanon NXT®

Introduction

Several subdermal contraceptive implants are currently available: etonogestrel (ENG) implants (Implanon NXT®/Nexplanon®, Merck) and levonorgestrel (LNG) implants (Jadelle®, Bayer; and Sino-implant®/Levoplant®, Shanghai Dahua Pharmaceutical Co Ltd). All types release a progestogen at a controlled rate, providing very effective contraceptive protection over their 3-5-year lifespan. Implants can be bent or broken with or without associated trauma, although the true incidence of implant damage is unknown. Removal of a structurally damaged implant may

be more technically challenging compared with standard implant removal.

Case Report

A 26-year-old woman, gravida 1, para 1, presented to our sexual and reproductive health clinic in Botswana in November 2017 requesting removal of her ENG implant, Implanon NXT®, due to concern that it had "broken in half". The woman reported that four days prior to presentation, her seven-year-old daughter had stamped on her left, inner, upper arm, over the site of the implant. She had immediately noticed a palpable bend in the implant and then unexpected and heavier than usual bleeding within a few days. The ENG implant had been inserted 13 months earlier, in accordance with the manufacturer's instructions[1] at the same sexual and reproductive health clinic and without complications. She had been satisfied with it prior to this presentation. She had no past medical history, was HIV negative, on no concomitant mediations, and had had a recent normal Pap smear. She reported regular menstrual cycles before initiating the implant and regular monthly bleeding after implant initiation. She had been able to palpate the implant since insertion. On clinical assessment, the implant was palpably bent in the middle section. It was removed via the routine "pop-up" technique, as described in the manufacturer's prescribing information[1]. Inspection confirmed it to be bent and incompletely fractured at the middle (Figure 1). A new ENG implant was inserted through the same removal incision. There were no complications associated with the removal or re-insertion procedures. The woman was advised to return for follow-up in one month and the manufacturer was notified.

Discussion

A contraceptive implant can be broken at the time of insertion, at the time of removal, or whilst *in situ*. Breakage at the time of insertion may be due to damage inflicted by the insertion needle if the applicator is not pulled back in one smooth motion; even if the implant remains whole, it might be weakened and predisposed to breaks or fractures when an outside force is applied whilst it is *in situ*. Breakage at the time of removal may be due to inadvertent damage caused by the healthcare provider's removal scalpel.

Reviewing the literature, we found twenty-one individual case reports of fractured contraceptive implants, in addition to a survey which generated a "crowd-sourced" case series of fifty-four fractured implants, of which fifty-two were ENG implants[2] (Table 1). All published case reports of damaged/fractured implants are from Europe and the United States, and are likely to represent a small fraction of the total cases globally. Seven of the case reports were associated with trauma[3-7], and fourteen were not associated with trauma[5,6,8-12].

No published data exist on the prevalence of implant fracture for Implanon NXT® and Jadelle®. We found no case reports of fractured Jadelle® implants, and other authors have noted that there is no information on this issue from Jadelle® post-marketing surveillance data[13]. The topic of damaged implants is not covered in the manufacturer's information for Nexplanon®[1] or Jadelle®[14]. Implant breakage occurred during 1.7% of Norplant® removal procedures[15].

Based on reported cases, most clients and healthcare providers have preferred removal and replacement of damaged implants for reassurance of consistent hormone release, contraceptive efficacy and side effect profile[3,5-7,9]. However, no data is available to guide decision-making in this regard. *In vitro* data from the manufacturer of Implanon NXT® showed a slight increase in etonogestrel release from damaged implants, but this was thought not to be at such rate as to lead to the implant expiring before the end of its usual life span and therefore was not thought to affect contraceptive efficacy[16]. Hormone-related side effects have been reported in some cases of implant damage/fracture, particularly abnormal bleeding[2-5,7,8,10].

While likely to be an uncommon occurrence, as implant provision is scaled up globally and especially in lower- and middle-income countries (LMICs)[17], healthcare services and healthcare providers need to be aware of the possibility of implant fracture/damage so as to manage this most appropriately and safely.

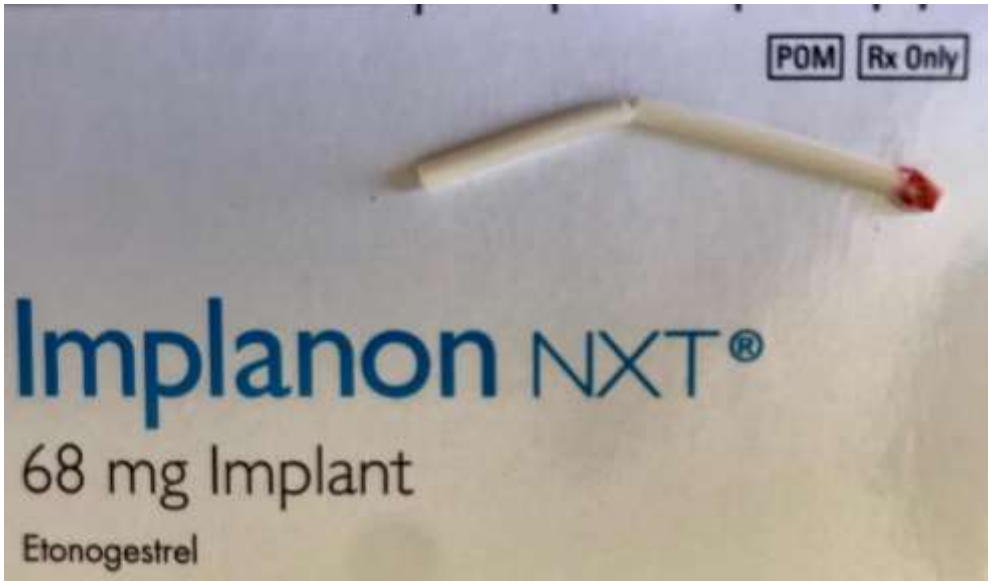

Figure 1: Photograph of the incompletely fractured Implanon NXT® implant presented in this case study, after removal

Table 1: Summary of published case reports of fractured contraceptive implants

Case	Authors	Year	Country	Journal	Type of Implant	Fracture pattern	Associated Trauma	Associated symptoms
1	Pickard and Bacon	2002	UK	J Fam Plann Reprod Health Care	Implanon	Incomplete fracture, one piece	Yes	Change in bleeding pattern
2	Agrawal and Robinson	2003	UK	J Fam Plann Reprod Health Care	Implanon	Complete fracture, two pieces	No	Change in bleeding pattern
3	Tomás-Tello and Hodgson	2010	UK	J Fam Plann Reprod Health Care	Implanon	Incomplete fracture, one piece	Yes	Change in bleeding pattern
4					Implanon	Incomplete fracture, one piece	Yes	Change in bleeding pattern
5	Doshi	2011	UK	J Fam Plann Reprod Health Care	Implanon	Bent	No	Nil
6	Bentley	2013	UK	J Fam Plann Reprod Health Care	Nexplanon	Incomplete fracture, one piece	Yes	Change in bleeding pattern
7*					Nexplanon	Complete fracture, two pieces	No	Nil
8*					Nexplanon	Bent	No	Burning pain at implant site
9**					Nexplanon	Incomplete fracture, one piece	No	Nil
10**					Nexplanon	Incomplete fracture, one piece	No	Pain at implant site
11					Nexplanon	Bent	No	Not documented
12					Nexplanon	Bent	No	Not documented
13					Nexplanon	Complete fracture, two pieces	No	Not documented
14					Implanon	Bent	No	Not documented

15	Torres *et al.*	2013	Portugal	Contraception	Implanon	Complete fracture, two pieces	No	Nil
16					Implanon	Complete fracture, two pieces	Yes	Nil
17	Elliman	2013	UK	J Fam Plann Reprod Health Care	Nexplanon	Incomplete fracture, one piece	No	Change in bleeding pattern
18	Khatri	2015	UK	J Fam Plann Reprod Health Care	Nexplanon	Complete fracture, more than two pieces	No	Nil
19	Hartnell	2015	UK	J Fam Plann Reprod Health Care	Nexplanon	Incomplete fracture, one piece	No	Nil
20–73	Crouthamel *et al.*	2018	USA	J Pediatr Adolesc Gynecol	Implanon x 14; Nexplanon x 38; x Histrelin acetate xx 2***	Bent x 7; incomplete fracture, one piece x 23; complete fracture, two pieces x 16; complete fracture, more than two pieces x 8	Yes x 28; unknown x 25	Change in bleeding pattern x 4; unknown x 6
74	Campodonico *et al.*	2019	USA	J Am Board Fam Med	Nexplanon	Incomplete fracture, one piece	Yes	Change in bleeding pattern
75					Nexplanon	Complete fracture, two pieces	Yes	Change in bleeding pattern

Careful monitoring and reporting of implant-associated complications is important to establish the true prevalence of implant fracture/damage and outcomes. This should include information about: (a) mechanism i.e. whether associated with trauma or not; (b) time from insertion to damage/fracture and (c) clinical significance i.e. whether considered to be associated with change in contraceptive efficacy or side effects. This data may help inform decisions about whether removal and replacement are indicated, particularly in settings with limited resources or where removal services are in their infancy.

Finally, it is important to consider that the removal of damaged implants may be technically challenging, and healthcare providers need to be to be aware of this in order to perform competent and safe removals. For example, removal of a fractured implant may require multiple incisions[6], or it may be appropriate to make the removal incision at the site of the implant fracture[5]. If the implant is known to be damaged or if part of the implant is not palpable, then ultrasound assessment prior to attempting removal should be considered[18].

Conclusion

Taken into consideration alongside other cases reported by our colleagues in sexual and reproductive health programmes worldwide, this case highlights the issue of fracture or damage as a potential complication of contraceptive implant use. Healthcare providers need to be aware of this possibility in order to provide appropriate client counselling and safe removal, and consideration should be given to this issue during the development of implant programmes in LMICs.

Contribution of Authors

RH, AMG, and TK performed the implant removal described in this case report. RH and AMG wrote the first draft of the manuscript under the supervision and guidance of GP and CM. All authors contributed substantially to the revision of the manuscript and approved the final manuscript.

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