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# IUD Displacement with Both Arms Deeply Embedded into Myometrial Tissue: Case Report

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**Abstract**

**Background:** Intrauterine device (IUD) is one of the most commonly used long-acting reversible contraceptives (LARCs) method worldwide. IUD may pose some disadvantages regarding its use and may cause unwanted events. IUD displacement with both arms embedded through myometrial tissue is one of the unwanted events that could occur rarely. This condition has been confered a diagnostic challenge to many physicians . However, most cases could accurately be detected using 3D transvaginal sonography. Mangement of IUD displacement with invisible arms is very challenging that needs to be performed cautiously. Hysteroscopic evaluation and treatment may be the last resort when other approaches fail.

**Case presentation:** A 33-year-old female had had Nova T IUD inserted during caesarean section one year before presentation. The patient had no remarkable medical history except for myomectomy performed two years earlier. She was about to have another pregnancy so she needed to get her IUD removed. 2D and 3D transvginal sonography was performed to confirm IUD position. Sonography results showed displacement of IUD with both arms embedded through myometrial layer. Hysteroscopic evaluation under regional anesthesia was then performed to evaluate this condition. Hysteroscopic views did not reveal the IUD arm but IUD stem that was transversely displaced suggesting the both arms was deeply embedded into myometrial layer. Hysteroscopic removal was then performed with astonishing result. Post-procedural condition was uneventful without any significant complications.

**Conclusion:** Intrauterine device displacement with embedment of both arms occurs infrequently therefore still confers a great diagnostic and management challenges. Hysteroscopic evaluation and management may be the best option available when this condition is suspected.

**Keywords:** Intrauterine device, displacement, embedment, Transvaginal sonogrphy, Hysteroscopy

## 1. Introduction

Intrauterine device (IUD) is one of the most commonly used long acting reversible contaceptive methods (LARC) [1]. Worldwide, 13.9-14.3% of women with reproductive age use intrauterine device as their contraceptive method [2,3]. IUD can be categorized in two types i.e. hormonal and non-hormonal [4]. The main mechanism of action of non-hormonal IUD is by creating unfavored intrauterine environement, producing inflammatory response and lysosomal activation that are spermicidal [5]. Whereas hormonal IUD works mainly by increasing cervical mucus viscocity so the sperm could not penetetrate this barrier and rendering endometrial atrophy [5].

As one of the most commonly used contraceptive methods worldwide, IUD has some advantages and disadvantages. The most renowned advantages for IUD uses is its long acting reversible system with minimal complications and need lesser clinical follow up visit. Albeit its advantages, IUD could cause some harmful and undesirable effects. Malposition of IUD is considered one of the most undesirable event that my occur. IUD malposition can be classified into expulsion, displacement, embeddment, and perforation [4].

There true incidence of IUD malposition is still not known but may be higher than what is expected when evaluated by 3D ultrasonography [6]. Risk factors for IUD malposition are still controversial but some authors suggest that suspected adenomyosis may contribute to malpositioned IUD whereas prior vaginal delivery may have protective effect [7,8]. IUD displacement itself may occur in up to 25% females with an IUD. Most of the cases do not show any signs or symptoms but some patients may present with cramping or bleeding [9].

Two-dimensional sonography has been considered as an effective method to determine IUD malposition and its complications. However, three dimensional transvaginal sonography can now be more relaibly applicapble when evaluating IUD malposition due to its capability to locate IUD in volume. 2D-transvaginal sonography often miss IUD malposition especially when it is embedded in the myometrium [10].

IUD displacement still raises concern about its management. Various methods for managing the IUD may be performed in such case include hysteroscopic removal, blind manipulations with forceps or clamp, and fluoroscopic tehcnique. Among them, hyesterscopic removal is the most renowned method considering its safety profile and best precision.

**2. Case Presentation**

A 33 years old Chinese Indoensians female, para 1, presented to our medical clinic for Nova T IUD removal. IUD had been placed 1 year ago during cesarean delivery. Caesarean delivery had been performed with indication of previous uterine surgery 1 year before presentation.Meanwhile, the patient was about to have another pregnancy this year so she wants to get her IUD removed. There had been no IUD-related complaints such as pelvic pain, irregular vaginal bleeding, vaginal discharge, and hypermenorrhea for the last one year before presentation. Patient's past medical history was unremarkable except for myomectomy that had been performed 2 years earlier.

2D ultrasonography had beeen performed prior to trial of IUD removal (Fig. 1). The IUD stem was seen on 2D ultrasound examination but both IUD arms were barely seen on this evaluation, so we decided to performed 3D transvaginal sonography in order to have adequate spatial images of the IUD (Fig. 2). The IUD then was confirmed to be intrauterine but the stem and both arms were seemed to had displaced. Removal procedure was then initiated preceded by pelvic examination. On pelvic examination, the IUD thread was not seen, so we try to use alligator forceps blindly aiming to get the stem of IUD. This manuever was failed at initial attempt so we decided to try it again at her next menstrual period. The second attempt that performed at her menstrual period also failed to remove the IUD so we decided to end the intervention and consider hysteroscopy as an alternative method.

**Figure 1. 2D Transvaginal sonography view of IUD confirmed that the IUD was still intrauterine**

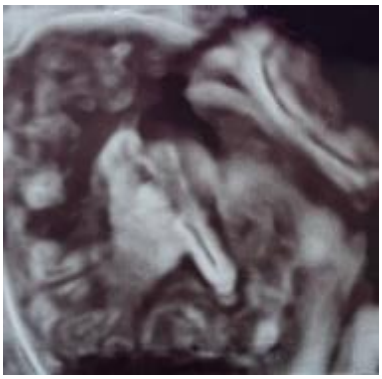

**Figure 2. 3D Transvaginal sonography show part of IUD was embedded into myometrium**

Hysterescopic evaluation then was planned to detect if there was any IUD malposition. Hysterescopic evaluation under regional anesthesia did find transversely displaced IUD with no arm seen (Fig 3). This condition suggested that both arms were embedded into myometrial layer. Challenging IUD removal was performed with hysterescopic extractor and was successful. Removed IUD was seen sligthly bended with both arms found intact (Fig. 4). The patient was discharged after the procedure and did not have any significant complaint at follow up visit. The patient is now ready to have another pregnancy.

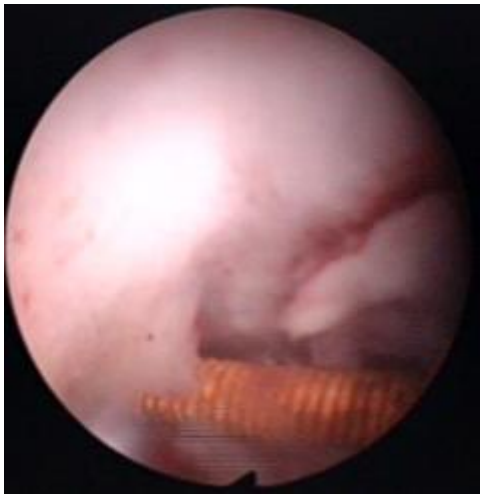

**Figure 3. Displaced IUD with no arm was seen suggesting that IUD arms were embedded into myometrial layer**

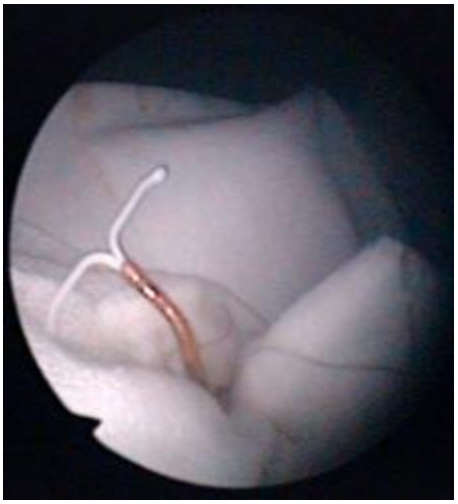

**Figure 4. After-procedue picture showed bending IUD with both arms intact**

**3. Discussion**

Difficulties in identifying the IUD thread lead us to raise concern about IUD malposition. Ideally, the IUD must be located in upper fundal portion of the uterine cavity [6]. When the IUD is not placed in the uterine fundus, we then may have realized that IUD malposition had occurred [6]. IUD Intrauterine device malposition is one of the most common complications regarding its position in the uterine cavity. This condition may occur in up to 5% of cases of IUD inserted [3,12]. Malpositioned IUD may be classified into some forms, i.e., expulsion, displacement, embedment, and perforation [4,7].

The exact mechanism by which IUD malposition can occur has been debatable. Braaten et al. [8] postulated that suspected adenomyosis was the greatest risk factor for IUD malpositioning (OR 3.04, 95% CI 1.08-8.52), whereas prior vaginal delivery (OR 0.53, 95% CI 0.32-0.87) and private insurance (OR 0.38, 95% CI 0.24-0.59) were protective. Interestingly, Goldstuck and Wildemeersch [13] proposed that imbalance between the size of the IUD and that of the uterine cavity may cause production of asymmetrical uterine forces that lead to IUD embedment, or perforation. Incomplete unfolding of IUD arms at the uterine fundus may also predispose to IUD malposition especially when the uterine cavity is small [13,14]. This occurs as a result of uterine contractile forces that displace the IUD [13]. In our case, the patient had a history of mymectomy performed 2 years before presentation. We suggested that defect in uterine wall may had compromised the uterine contractile forces particularly during postpartum period. Increased ocytocin production during postpartum period may elicit uterine contraction that increased uterine forces produced. In addition, increased endorphin production in lactating women may increase pain treshold that makes uterine malposition become undetectable [1].

Displacement and embedment of IUD typically produce no symptoms as occurred in our patient but some authors suggest that malpositioned IUD may increase the likelihood of pain and bleeding [6,7]. Due to its asymptomatic feature, IUD displacement is frequently found only in clinical follow up. This confers a greater challenge to us to diagnose this case.

Ultrasonography is the mainstay for initial evaluation in suspected IUD malposition as it is widely available, inexpensive, and does not involve radiation [9]. Three dimensional sonography is preferable for visualisation of both displaced copper IUD and hormonal IUD [10]. The advantages of 3D ultrasoography are that the abilities to obtain a volume rendering picture, so the IUD can be precisely located and display the coronal aspect of the image [4,10].

The management of grossly displaced and embedded IUD may be very challenging, especially if the portion of the IUD has perforated the uterine wall. In these cases, hysteroscopic evaluation and management is highly invaluable [6]. Hysteroscopic evaluation offers precise localization of the IUD and its surroundings so the removal can be performed safely by minimizing the risk of perforation and hemorrhage associated with blind exploration [12,15]. In our case, we utilized grasping forcep to grab the stem of the device then extracted the IUD. This procedure was performed successfully without any considerable obstacles. Mittal et al. [12] also described a case series of IUD embedment and found that under hysteresocopic vision the devices were easily removed without complications. These findings suggest that hysteroscopis evaluation and management may be the preferred management of suspected IUD displacement and/or embedment.

**4. Conclusion**

Intrauterine device displacement and arms embedment is a rare complication in IUD users. As the true incidence of IUD embedment and displacement is still not known, further surveillance should be done when the IUD thread is not seen or IUD embedment is suspected. In our case, the patient was totally asymptommatic and 3D transvaginal sonography gave invaluable spatial images to diagnose IUD displacement and embedment as 2D ultrasound often fails to detect the arm of IUD. In addition, hysteroscopic evaluation offers invaluable benefits for diagnosing and treating IUD displacement and embedment. Combined 3D ultrasonography and hysteroscopic evaluation may be indespensable method to manage suspected IUD displacement.

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