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Intrauterine Device Migration to the Broad Ligament: A Case Report and Comprehensive Review of Complications

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Abstract

Intrauterine Devices (IUDs) are among the most commonly used contraceptive methods, with approximately 150 million users worldwide, particularly in developing regions. Although generally safe and effective, IUDs can occasionally lead to complications, such as uterine perforation and migration into adjacent structures. We report the case of a 45-year-old woman who presented with chronic pelvic pain following IUD insertion. Ultrasound imaging confirmed an abnormal location of the device, and laparoscopy subsequently revealed migration of the IUD into the broad ligament. This case emphasizes the need for clinicians to consider IUD migration in patients presenting with pelvic pain post-insertion, highlighting the importance of timely diagnosis and minimally invasive surgical management.

Keywords: Intra uterine device; Migration; Complication; Board ligament; Diagnosis; Management

Introduction

The Intrauterine Device (IUD) is one of the most widely used contraceptive methods worldwide due to its long-term efficacy, reversibility and minimal maintenance requirements [1]. With a Pearl index of less than 1 per 100 woman-years, it is considered highly reliable, offering prolonged contraception without the need for daily adherence [2]. Its contraceptive action occurs primarily within the uterine cavity, but also impacts the fallopian tubes and sperm function [3].

While generally well-tolerated, the IUD is not without risks. Rare but serious complications such as uterine perforation and spontaneous migration into the abdomen have been reported [4]. These complications can result in migratory visceral locations, which may lead to severe or even life-threatening outcomes [5]. The uniqueness of this case lies in the rare migration of the IUD into the broad ligament, underscoring the importance of early diagnosis and appropriate management when IUD complications arise.

Case Presentation

A 45-year-old woman presented with persistent pelvic pain 10 days after the insertion of an Intrauterine Device (IUD). Her gynecological history revealed menarche at age 12, with regular menstrual cycles lasting 28-30 days and menstruation lasting 3-5 days. She denied dysmenorrhea and reported her last menstrual period on June 1, 2024. She had two previous spontaneous vaginal deliveries.

Upon examination, the IUD strings were not visible at the cervix and bimanual palpation elicited mild right-sided abdominal tenderness. Transvaginal ultrasound confirmed an empty uterine cavity with the IUD located adjacent to the uterus on the right side **(Figure 1)**. An abdominal X-ray further revealed an irregular high-density shadow in the pelvic cavity, suggesting an IUD migration **(Figure 2)**.

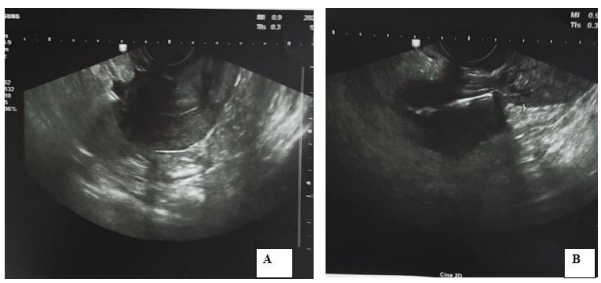

Figure 1: (A) Transvaginal ultrasound showing an empty uterus; (B) Hyperechoic metallic artifacts located outside the myometrium on the right side of the uterus.

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Figure 2: Abdominal X-ray demonstrating irregular high-density shadows in the pelvic cavity (indicated by the red arrow)

Given these findings, laparoscopic surgery was indicated and performed under general anesthesia. Intraoperatively, dense adhesions were observed involving the greater omentum, the right round ligament, the right broad ligament and the right anterior abdominal wall **(Figure 3 and Figure 4)**. Careful dissection exposed the migrated IUD, with its arms embedded in the right round ligament and the serosal surface of the right anterior uterine wall, while its tail was lodged in the right broad ligament. The IUD was successfully retrieved without causing any damage to adjacent organs. The patient recovered uneventfully, expressed relief with the outcome and is now exploring alternative contraceptive options.

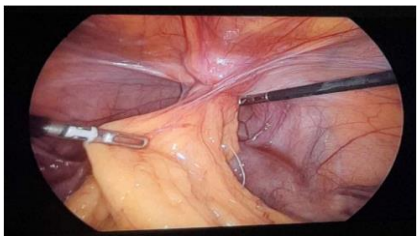

Figure 3: Laparoscopic view showing adhesions between the greater omentum and the anterior abdominal wall.

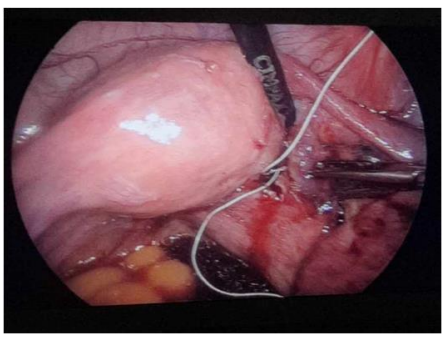

Figure 4: Laparoscopic image displaying the tail of the migrated IUD located in the right broad ligament.

Discussion

The Intrauterine Device (IUD) is a widely recognized method for non-permanent contraception, especially in developing countries and rural areas. Although the insertion procedure is generally straightforward, it carries risks and complications, such as migration resulting from uterine perforation and potential infection [4]. Uterine perforation is relatively rare, occurring in approximately 1.3 per 1,000 insertions, as evidenced by substantial clinical studies [1]. This complication often manifests at the time of insertion and may go undetected until later evaluations. IUD migration typically occurs into the peritoneal cavity and in rare instances, into adjacent pelvic organs such as the bladder or rectum [2,5].

The contraceptive effect of the IUD is primarily due to the inflammation it induces in the endometrium, which inhibits implantation. This inflammatory response leads to the accumulation of enzymes and lysosomal substances that contribute to endometrial destruction and facilitate IUD migration [6]. Uterine perforation can occur during IUD insertion, often due to technical errors or improper instrument use. Perforations are classified as partial, where the IUD penetrates only part of the uterine wall or cervix or complete, when the device breaches the uterine wall and enters the abdominal cavity. In some cases, perforation may develop later through gradual erosion [7,8]. Migration has been reported to involve areas such as the omentum, broad ligament, rectosigmoid region, peritoneum, bladder and even the inguinal region [8-10].

Risk factors for uterine perforation include weakened uterine muscles due to multiple pregnancies, hypoplastic uteri, scarring and significant uterine anteversion or retroversion, particularly after childbirth [6]. Some experts recommend follow-up ultrasounds to confirm proper IUD positioning.

The risk of perforation is also influenced by factors such as the timing of insertion, the type of IUD, the clinician's experience, uterine and cervical morphology, the postpartum state and any history of prior perforations [6,7]. Performing a pre-implantation ultrasound to assess uterine length and position can improve the accuracy of the procedure and enhance patient satisfaction. Additionally, a less invasive approach is preferred over a "blind" insertion technique [8,9].

Uterine perforation caused by an IUD is typically asymptomatic [9,11]. However, when perforation occurs during insertion, it may result in severe pain, requiring prompt attention from the healthcare provider. Symptoms such as urinary tract infections, irregular vaginal bleeding, severe abdominal pain, significant hematuria, unplanned pregnancies or recurring lower abdominal pain may also indicate improper IUD

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positioning [12,13].

During examination, perforation is suspected if the retrieval strings are missing, provided they haven't retracted into the cervical canal [6]. However, clinical diagnosis can be difficult and often requires additional imaging to accurately locate the device.

Ultrasound is the preferred method for assessing IUD migration, as it can detect entrapment, dislodgment or expulsion [14]. In cases of extrauterine migration, further imaging, such as Computed Tomography (CT), Magnetic Resonance Imaging (MRI) or X-rays, may be necessary [15]. A large-format abdominal X-ray, once pregnancy is excluded, can confirm expulsion if the IUD is not visible, though it does not provide precise information about its exact location [15,16].

If imaging is inconclusive, laparoscopy or in rare cases, laparotomy-may be required to locate the device [16]. These procedures can be complicated by a peritoneal inflammatory response, leading to the IUD becoming embedded in adhesions, making extraction difficult and requiring the expertise of an experienced surgeon [17,18].

Conclusion

Intrauterine devices (IUDs) are an effective and widely used method of non-permanent contraception, particularly in resource-limited settings. This case report highlights the potential complications, such as migration due to uterine perforation, which, although rare, necessitate careful insertion techniques and thorough patient follow-up. The literature reinforces these findings, emphasizing the importance of recognizing risk factors for complications. Healthcare providers must enhance patient education on potential risks and adhere to best practices during IUD insertion. Ongoing research will further improve understanding and management of IUD-related complications, ultimately enhancing patient outcomes and satisfaction.

Competing Interests

The authors declare no competing interest.

Authors Contributions

Yasmine Ben Ali and Oumayma Ben Rejeb contributed to patient care, data collection and drafting the manuscript. Syrine Chelly, Amina Chaieb, Maroua Baazaoui contributed to revising the article critically for important intellectual content. Abeljalil Khelifi contributed to patient care and revising the article critically for important intellectual content. All authors approved the final submitted manuscript.

Informed Consent

The authors declare that they have obtained signed consent from the patient.

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