CASE REPORT JSLS

The Perforated Intrauterine Device: Endoscopic Retrieval

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ABSTRACT

Background: Uterine perforation is the most serious complication associated with an intrauterine contraceptive device (IUD). Minimally invasive techniques, such as hysteroscopy and advanced laparoscopy, are ideally suited to the diagnosis and surgical management of the perforated IUD.

Case Reports: Three cases of uterine perforation caused by an IUD and treated with endoscopic surgery are presented. In all 3 cases, the IUD was located by using x-rays, ultrasonography, or pelvic magnetic resonance imaging. Diagnostic laparoscopy was performed to identify the specific location of the IUD and to remove it. All patients recovered without incident.

Conclusion: The gynecologic surgeon should acquire familiarity with the complications of, and proficiency in managing, perforated and ectopic IUDs by using modern surgical techniques that permit the patient's rapid return to health.

Key Words: Uterine perforation, IUD, intrauterine contraceptive device.

INTRODUCTION

The practice of placing foreign objects into the uterus of humans, as well as animals, as a means to prevent unwanted pregnancy may have originated thousands of years ago. It is rumored that nomadic peoples placed smooth stones into the uteri of their female camels to prevent conception during extended travels. It was not until the twentieth century that research and development of modern intrauterine devices (IUDs) progressed significantly. Today, IUDs provide safe, highly effective, reversible long-term contraception to almost 100 million women worldwide.[1]

Despite global popularity, IUD use in the United States declined precipitously over the 30 years following the Dalkon Shield debacle. Adverse outcomes and massive product liability litigation associated with this now infamous implement prompted IUD manufacturers to withdraw completely from the US market, and not a single IUD was sold in the US between 1983 and 1988.[2] Though use has increased slightly since 1988, the IUD is used by only 0.8% of US women using contraception today.[3] A recent survey of US obstetrician-gynecologists suggests that fear of litigation and the continued belief in a causative association with pelvic inflammatory disease restricts their endorsement of the IUD to only a specific minority of their patients.[4]

Two IUDs are currently approved for use in the US: the copper-based Paragard TCu-380A (FEI, North Tonawanda, NY) and the levonorgestrel releasing system, Mirena (Leiras-Schering A.G., Finland). These devices have been extensively studied and an increasing abundance of scientific evidence suggests that their use threatens neither the health nor future fertility of the women who use them.[5] Economic analysis has shown IUDs to be the most cost-effective of 15 methods of contraception studied, both for the individual user and in terms of overall health care resources.[6] Given these facts, it is likely that IUD use in the US will increase in the future. Therefore, clinicians should be fully familiar with the potential complications associated with IUD use and their management. We present 3 cases in which endoscopic surgery was used to treat the most serious of these complications, uterine perforation.

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CASE REPORT ONE

A 31-year-old, gravida 1, para 1 woman presented for a routine postpartum visit 7 weeks after primary cesarean delivery of twins. Her physical examination was unremarkable and a Mirena IUD was placed without any recorded difficulty. Upon examination one year later, the strings of her IUD were no longer visible. Pelvic ultrasonography was promptly obtained and showed a normal empty uterus with no abnormality. A pelvic x-ray was also obtained and interpreted as normal by the staff radiologist. The IUD was believed expelled, and the patient reassured accordingly. Later that year, x-rays of the lumbar spine revealed the IUD within the pelvis. The patient was taken to the operating theater where diagnostic hysteroscopy failed to locate the IUD. Diagnostic laparoscopy was then undertaken, and the IUD discovered resting freely in the posterior cul de sac. The IUD was recovered and the patient discharged home the same day. Her postoperative course was uneventful.

CASE REPORT TWO

A 28-year-old, gravida 6, para 4 woman received a Mirena IUD 8 weeks after elective repeat cesarean delivery. No complication or difficulty was encountered upon placement of the device. One year later, the patient became pregnant with the IUD in situ and aborted spontaneously. Her physician attempted to remove the IUD at her follow-up visit, resulting in avulsion of the strings from the IUD. Operative hysteroscopy revealed the body of the device protruding into the uterine cavity from the anterior uterine wall. Cystoscopy was normal, and attempts to remove the device, both under direct hysteroscopic vision and blindly using polyp forceps were unsuccessful. We received the patient in consultation and obtained a pelvic magnetic resonance imaging (MRI). This confirmed the moderate uterine retroflexion appreciated upon physical examination, and showed the IUD deeply embedded within the anterior myometrium at the level of the flexure. Again, the patient was taken to surgery and diagnostic hysteroscopy performed. This time, no portion of the IUD was visible within the uterine cavity, and hysteroscopic dissection using a resectoscope under fluoroscopic guidance was unsuccessful in locating the device. Diagnostic laparoscopy was performed and the uterus seen to be grossly normal. Fluoroscopy was then used, and the IUD was located within the myometrium. A 1-cm incision was made in the anterior uterine wall just above it, exposing the IUD, which was then easily withdrawn from the surrounding tissue, and the operative site laparoscopically sutured to close the wound in 2 layers. The patient recovered without incident and was discharged home on the day of her surgery.

CASE REPORT THREE

A 27-year-old, gravida 2, para 2 woman had a Paragard IUD placed without difficulty 6 weeks after an uncomplicated vaginal delivery. Three months later, she was found to be pregnant. IUD strings were not visible upon examination, and a routine obstetrical ultrasound showed a viable intrauterine fetus of approximately 12 weeks gestation without any evidence of a foreign body. The IUD was presumed expelled and routine obstetrical care undertaken. The patient had an uneventful pregnancy and delivered vaginally at term without complications. Six years later, x-rays of the hips incidentally revealed a foreign body suggestive of an ectopic IUD in the left aspect of the pelvis. The patient was referred to us for consultation. Pelvic ultrasonography revealed a normal appearing uterus with no IUD present. After full bowel preparation, a diagnostic laparoscopy was undertaken. The IUD was found adhered to the left ovarian fossa. The left ovary and sigmoid colon were densely adhered overlying the area. Careful sharp dissection was used first to free the ovary and sigmoid colon from the pelvic sidewall, and then to successfully remove the embedded IUD. Insufflation proctoscopy performed under laparoscopic visualization revealed no rectal injury. Cystoscopy, performed after administration of intravenous indigo carmine, confirmed ureteral integrity. The patient's recovery was uneventful. She was discharged home on the afternoon of her surgery.

DISCUSSION

Uterine perforation is the most serious complication associated with use of an intrauterine contraceptive device. The frequency of this occurrence is estimated to be between 0.05 and 13 per 1000 insertions (average, 1.2/1000) and appears to depend on the type of device placed, the skill of the operator, position of the uterus, and intensity of follow-up.[7,8] Despite being initially asymptomatic, the majority of uterine perforations are believed to be committed at the time of IUD insertion.[9] Perforations may be partial, with some portion of the device remaining within the endometrial cavity, or complete, with the device passing wholly into the peritoneal cavity. Various classification schemes describing the extent and location of perforated IUDs have been devised, but their clinical utility remains unclear.[9–12] The natural history of IUD translocation following any type of uterine perforation is not well understood and likely depends on a number of factors, such as

the type of IUD, uterine morphology, the site of perforation, the presence and location of leiomyomata, and the mechanics at the given insertion event.[9,10,13,14] Although possibly associated with a slightly increased expulsion rate, IUD placement immediately following vaginal or cesarean delivery does not increase the risk of uterine perforation.[14]

Up to 15% of uterine perforations caused by IUDs affect adjacent pelvic and abdominal viscera, with the intestines most often involved.[9] Intestinal complications arising from an ectopically placed IUD include perforation and obstruction of the large and small bowel, mesenteric penetration, bowel infarction, rectal strictures, and rectouterine fistula.[15] Chen et al[15] reported on a case of ileal penetration 4 weeks after uterine perforation with a copper-containing IUD. That report also contains a detailed review and concise summary of all cases reported from 1973 through 1997 in which bowel injury occurred following uterine perforation with an IUD.

After ruling out pregnancy in the patient with an IUD who has abdominal pain or abnormal vaginal bleeding, the possibility of uterine perforation must be addressed to avoid potentially serious complications. A "missing" IUD string should raise suspicion for this complication. In this situation, real-time transvaginal ultrasonography is the most appropriate initial diagnostic modality. If the IUD is seen within the uterus, and removal desired, this may be accomplished by using ultrasound guidance with the patient under paracervical anesthesia. If unsuccessful, operative hysteroscopy should be undertaken.

If no IUD is seen within the uterus on ultrasound, x-rays of the abdomen and pelvis should be obtained. All IUDs are radiopaque and 2 to 3 different views should be used for optimal localization. The interpreting radiologist should be informed of the clinical circumstances of the case to optimize image interpretation. Unusual cases, such as cases 2 and 3 above, may necessitate additional imaging, such as CT scanning or MRI.

Inert perforated IUDs without closed loops were traditionally allowed to remain in the abdomen of the asymptomatic patient. Most experts today advise removal of any perforated IUD.[16–21] If the IUD is deeply embedded into the myometrium or is present within the peritoneal cavity, operative laparoscopy is indicated for its removal. In certain instances a combination of hysteroscopy and laparoscopy and, rarely, fluoroscopy will be required for localization and removal of the ectopic IUD. Efforts should be made to protect and confirm that all vital structures of the abdomen and pelvis are without injury following all but the most straightforward operative IUD retrievals.

Safe and proper placement of an IUD requires the application of fundamental techniques of gynecologic practice, such as careful clinical determinations of uterine size, shape, and position before placement, and traction stabilization of the uterus upon insertion. The practitioner should refer to individual product package inserts to be familiar with insertion techniques specific to a given device. Follow-up speculum examination one month after insertion to visualize the strings confirms proper placement and permits timely intervention, if perforation has occurred. Published guidelines exist for selection of appropriate candidates for IUD use[22]; however, a discussion of these is beyond the scope of this document.

Scientific evidence increasingly attests to the safety and efficacy of the IUD. In light of this, attitudes of physicians and the general population in the United States towards this contraceptive method will likely grow more favorable. As IUD usage rates increase, it is in the best interest of public health that reproductive medicine practitioners be familiar with the potentially serious complications associated with IUDs and skilled in their subsequent complication management.

Minimally invasive techniques like hysteroscopy and advanced laparoscopy are ideally suited to the diagnosis and surgical management of the perforated IUD. These techniques allow for the localization and retrieval of these devices in most cases, while avoiding the prolonged recovery time associated with laparotomy. It is the responsibility of the gynecologic surgeon to acquire proficiency sufficient to address perforated and ectopic IUDs by using modern surgical techniques that permit the patient a rapid return to health.

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