Gynecol Surg (2004) 1:248–250
DOI 10.1007/s10397-004-0056-6

ORIGINAL ARTICLE

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The role of CT scan in laparoscopic retrieval of a perforated intrauterine device (IUD)

Received: 7 August 2004 / Accepted: 15 August 2004 / Published online: 5 October 2004

Abstract The intrauterine device (IUD) is a common modality of contraception in developing countries; it is inexpensive, effective, can be used for a long period of time and, most importantly, is reversible. An IUD may perforate through the uterine wall into the pelvic abdominal cavity or into adjacent organs. The common and accepted treatment for displaced IUDs is laparoscopic or surgical removal because of the possible risk of adhesion formation or damage to the intestine or urinary bladder. We report four cases of intra-abdominal IUDs that underwent successful extraction by laparoscopic surgery. All of our patients underwent a preoperative CT scan as it was more accurate in locating the device site and its relation to the surrounding organ and bowel. The CT scan gives more information, specifically, whether the device is extending into the bowel or urinary bladder.

Keywords CT scan · Uterine perforation · Intrauterine device (IUD) · Laparoscopic · Retrieval

Introduction

The use of an intrauterine contraceptive device (IUD) may be accompanied by various complications, perforation of the uterus constituting the most dangerous. Its frequency has been estimated at 0.05–1.68/1,000 insertions [1, 2]. Fifteen percent of such perforations and "lost" IUDs cause severe morbidity and mortality and should be managed carefully. The most common organs to be affected by the dislodged IUD are the intestines, omentum and urinary system [3].

The perforation can occur at the time of insertion, but it may occur at any subsequent time, hence, the importance of checking for the IUD string. The presentation of patients in general is within a median time interval of 17 months (range, 2 months to 13 years) post-insertion. In 1995, the IPPF (International Planned Parenthood Federation) [4] recommended that inert devices that have perforated the uterus need to be removed only if the woman has symptoms or requests removal, while copper devices should be removed, provided that the surgical risk is minimal.

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Case report

Here we report four cases of lost IUDs that were recovered by laparoscopy; all underwent a preoperative CT scan of the pelvis.

Case 1

A 28-year-old woman para 3 presented to an infertility clinic with backache, lower abdominal pain, inability to conceive and a history of unsuccessful laparotomy for retrieval of a missing IUD 4 years ago. According to the operative finding, the reason for the inability to retrieve the loop was severe adhesions around the rectum. Extraction was aborted to avoid damaging the rectum. On her recent presentation, the patient underwent hysterosalpingography, ultrasound and a plain X-ray. However, this did not add more than the intraoperative findings. CT scan of the pelvis was performed, which revealed the loop to be in the pre-rectal fat with some fluid collection, with no sign of penetration of the rectal wall (Fig. 1).

Case 2

A 27-year-old para 2 became pregnant 6 months after the insertion of the IUD, and on ultrasound, the IUD was found to be extrauterine. This patient had experienced lower abdominal pain and vaginal bleeding for 6 days after the insertion of the IUD, and most probably perforation occurred at the time of insertion. She had a normal vaginal delivery, and 6 months after delivery, the CT scan revealed the IUD to be on the wall of the urinary bladder with no penetration into the wall (Fig. 2).

Fig. 1 CT scan showing the IUD on the rectal wall with no extension to the lumen of the rectum

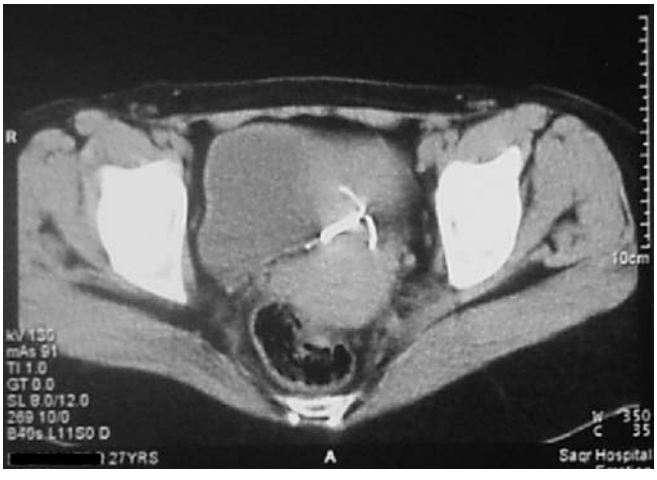

Fig. 2 CT scan showing the IUD on the urinary bladder wall

Case 3

A 31-year-old patient para 3 presented 8 months after the insertion of the IUD with missing strings and lower abdominal pain. Ultrasound failed to detect it, but a plain X-ray showed the IUD to be in the pelvis. Again, a CT scan showed the IUD to be between the sigmoid colon and the uterine wall, with no fluid collection or penetration of the sigmoid colon (Fig. 3).

Case 4

A 24-year-old para 2 presented with vaginal bleeding and a missing IUD string. Ultrasound failed to detect the device. Instead, there was an 8-week gestational sac. The bleeding persisted and was severe; during evacuation, the IUD was not detected, but a few days later, an X-ray revealed an extra-uterine IUD. This was followed by a CT scan, which located the IUD in the right side embedded in the broad ligament.

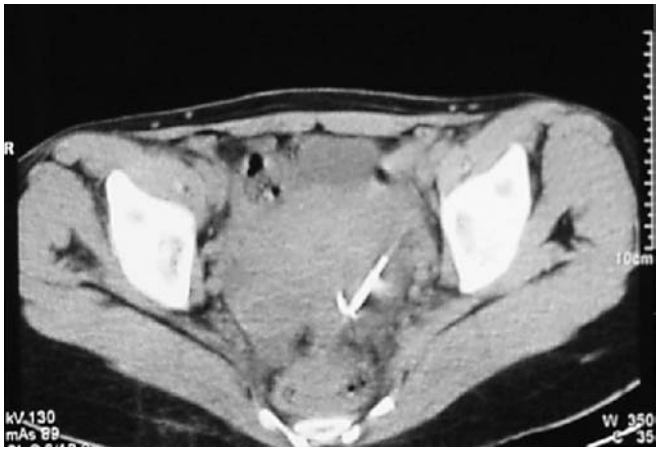

Fig. 3 CT scan showing the IUD between the uterine wall and sigmoid colon

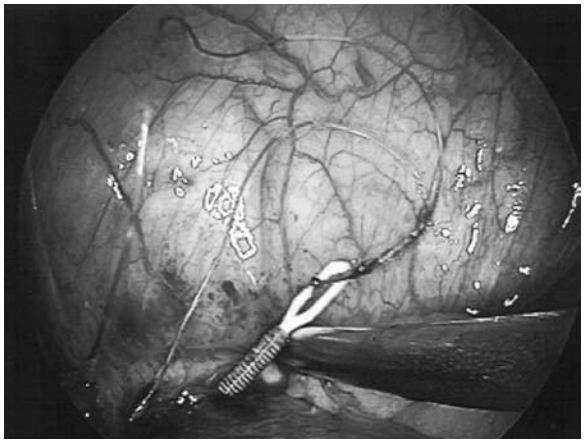

Fig. 4 IUD partially extracted from the tissue

Laparoscopic extraction

In the first case, there were dense adhesions at the recto-sigmoid junction, and a blood-stained cystic collection within the adhesions was noticed. The tip of the thread was found to be entangled within this adhesion. Gentle dissection guided us to the upper part of the rectum where the IUD was embedded in the preirectal tissue. Repeated traction of the thread with reasonable force dislodged the IUD completely. The cul de sac and pelvic cavity were irrigated with saline, and a drain was left in the pelvis. The patient received prophylactic antibiotics and had an eventful recovery. She was discharged 2 days later.

In the second case, the thread was identified embedded on the bladder wall. Fine dissection released the thread, and its gentle traction dislodged the IUD. In the third and fourth cases, the first part to be identified was one of the T limbs, with no adhesions around it, and the extraction was easier and treated as a day case (Figs. 4, 5, 6).

Discussion

IUDs are one of the most common forms of birth control in the third world; they are highly effective for at least 10 years, with a cumulative pregnancy rate of 2.6 per 100

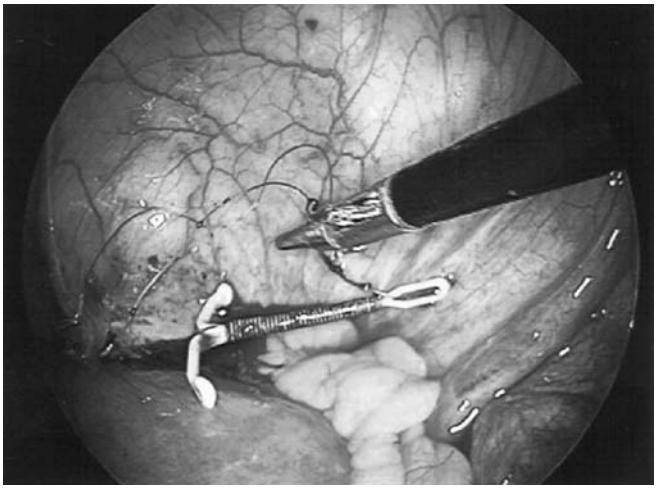

Fig. 5 IUD totally extracted from the tissue

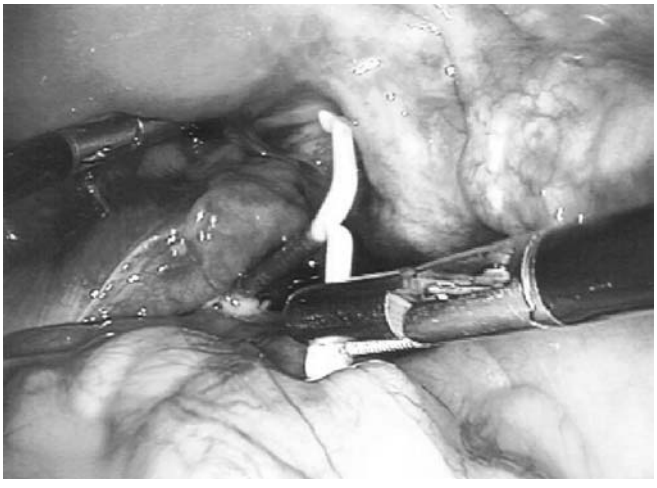

Fig. 6 Retrieving a perforated IUD with pus collection at its border

women. They are readily available, cheap and reversible, but despite this, their use is declining in the USA and Europe [4].

Gynecologists as well as surgeons may have to deal with missing IUDs that have perforated the uterus into the bowel, causing complications. Eighty-five percent of the intra-abdominal IUDs (40% entangled in the omentum) do not cause any problems. The rest may cause complications, which vary from simple lower abdominal pain to partial or total penetration of the bowel or urinary tract and may lead to more serious complications, such as intestinal obstruction, small bowel or colonic fistula. Additionally, it may lead to life-threatening complications, such as peritonitis.

The traditional search for a missing IUD includes a sonogram and, if this is inconclusive, an abdominal X-ray and hysterosalpingography [5]. With these investigations, laparoscopic retrieval ranged from 40 to 60% [6, 7], and the rest were removed by laparotomy.

The feasibility of IUD retrieval via the laparoscope depends on both the ability of the laparoscopist to spot the device within the peritoneal cavity and the degree of attachment of the IUD to intraperitoneal structures, particularly vascular and intestinal [6]. Preoperative CT scan to a certain degree has improved the laparoscopic approach, and in our cases made it possible to accurately locate and retrieve all the IUDs.

In our first case, laparoscopy was performed almost 4 years after the laparotomy failure. The preoperative CT scan and sigmoidoscopy gave us a clear picture of the site of the IUD. The dissection and traction on the thread were applied with some confidence, knowing that the device was not in the bowel, urinary system or a vessel. Another problem of persistent traction forces on the strings would have been the breaking down of the device or thread. To avoid these, we applied sharp dissection to a certain degree to the first case only. For those cases where the IUD is shown to be partially perforating the sigmoid colon or rectum and the arms or the thread are visible by sigmoidscopy, the IUD can be removed rectally [9], thus avoiding an unnecessary surgical intervention.

It is advisable that the gynecologist as well as the general surgeon be aware of these possible complications of IUDs [8, 10]. Thus, the appropriate consultation and treatment can be performed with limited morbidity.

We recommend the removal of a perforating IUD by laparoscopy after a preoperative CT scan and a sigmoidoscopy, since finding the exact location is a necessary step to safe and effective retrieval. However, prior to the CT scan, an ultrasound should be done to locate the IUD and exclude pregnancy. A CT scan will reduce undue reliance on the sonographic appearance of an IUD in the center of the uterine image, which may lead to hazardous attempts at transvaginal removal of a device that is partly intramural.

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