DERLEME / *REVIEW*

An Unusual Complication of Intrauterine Contraceptive Device: Perforation; Review of Literature

RAHİM İÇİ ARACA BAĞLI NADİR BİR KOMPLİKASYON: PERFORASYON; LİTERATÜRÜN İNCELENMESİ

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Abstract

This report of uterine perforation following intra uterine contraceptive device (IUD) insertion is based on a review of the literature. The type of IUD causing rupture, time of the insertion, the period of time up to detection of perforation and reason for admission were searched. Also affected organs and treatments for removal of IUD were examined.

The review was based on the analysis of 441 cases reported in the literature from 1969 to 2004. Search terms were 'uterine perforation, complications of IUD, uterine rupture, migration of IUD'.

The IUD was inserted in the intermenstruel period in 63.9% of cases. Most of the perforated IUD was Copper T and Lippes Loop. Visceral involvement arose in 155 cases; 85 concerned the omentum, 28 urinary bladder, 13 broad ligament, 12 appendix. IUD removed by laparoscopy in 40.4% patients and by laparotomy in 43.3% patients. In 8.6% women, IUD was removed by endoscopy.

Perforation of the uterus by an IUD is a serious complication and this is possible both during the insertion and later. Intraperitoneal IUDs do not necessarily produce symptoms but may intrude on neighboring viscera such as the bladder or intestinal tract. Removal of an IUD can be performed through endoscopic, laparoscopic, laparotomy procedures.

Key Words: Intrauterine devices, uterine perforation

Özet

Bu derlemede, RİA takılmasını takiben gelişen uterin perforasyonlar araştırıldı. Rüptüre neden olan RİA tipleri, RİA takılma zamanı, perforasyonun tespit edilmesine kadar geçen süre ve hastaların başvuru nedenleri araştırıldı. Ayrıca etkilenmiş organlar ve RİA çıkarılma şekilleri incelendi.

1969 ile 2004 arasında literatürde rapor edilmiş 441 vaka incelendi. Araştırma terimleri olarak 'uterine perforation, complications of IUD, uterine rupture, migration of IUD' kullanıldı.

Perforasyon olan vakaların %63.9'unda RİA intermenstrüel dönemde takılmıştı. Perforasyon oluşan vakalarda en sık Copper T ve Lippes Loop tespit edildi. Organ tutulumu 155 vakada izlendi. 85 vakada omentum, 28'inde mesane, 13'ünde broad ligament ve 12'sinde apendiks tutulumu vardı. Hastaların %40.4'ünde laparaskopi ile RİA çıkarılırken, %43.3'ünde laparatomi ve %8.6'sında endoskopiyle RİA çıkarıldı.

RİA'ya bağlı uterin perforasyon ciddi bir komplikasyondur. Bu takılma esnasında veya sonrasında gelişebilir. İntraperitoneal RİA'lar semptom vermeyebilir ancak komşu organ üzerine yerleşerek (bağırsak, mesane) komplikasyonlara neden olabilirler. Perforasyon sonrası RİA'ın çıkarılması endoskopi, laparaskopi veya laparatomi yoluyla olabilir.

Anahtar Kelimeler: Rahim içi araç, uterin perforasyon

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The intrauterine contraceptive device (IUD) is among the most effective forms of birth control available, with important advantages; it is inexpensive, effective, can be used for a long period of time and, most importantly, is reversible. A satisfactory IUD should be easy to introduce, easy to remove, have few side effects and should prevent pregnancy with a high degree of efficiency. These criteria have led to the development of a variety of shapes and size of IUD. At present only three are in general use:

- Inert IUD
- Copper IUD
- Progestin-containing IUD

IUD can be inserted in intermenstrual period and immediately after 1st trimester abortion if there is no infection. Copper T can be inserted in

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postpartum 48 hours. But at this time expulsion risk is higher. After 48 hours to 4 weeks perforation risk is high so must be careful and if possible insertion must be done after 6 weeks.[1]

There are some complications of IUD. Increased dysmenorrhea occurs with Copper T, increased menstrual blood loss occurs in first few cycles with Copper T and progestin-containing IUD, cramping/bleeding, partial or complete expulsion, misplaced IUD string (tail), potential for infection.[2]

A rare complication of IUD is the perforation of the uterus. Reported incidence of uterine perforation with IUDs varies from 1/350 to 1/2500 insertions. This can occur at the time of insertion, but may occur at any subsequent time; hence, the importance of checking for the IUD string. Contrary to what one might assume, perforation is often silent and the wayward device is either detected after further sequellae or found incidentally by imaging. 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.[3]

Material and Methods

This report of complete and partial uterine perforation and embedding following IUD insertion is based on a review of the literature of the past 35 (1969-2004) years. An analysis of 441 cases reported in the literature during this time were included. The language covered was english and turkish. Search terms were 'uterine perforation, complications of IUD, uterine rupture, migration of IUD'. 107 studies, most of them case reports from Pubmed and Turkish Medline were reviewed. The type of IUD causing rupture, time of the insertion, the period of time up to detection of perforation and reason for admission were searched. Also affected organs and treatments for removal of IUD were examined.

Results

The IUD was inserted post partum period in 133 (30.2%) cases, after curretage in 26 (5.9%) and in the intermenstruel period in 282 (63.9%) cases. Most of the perforated IUD was Copper T (26.3%) and Lippes Loop (24.4%). Also 32 copper 7, 10 NovaT, 10 Dalcon shields, 6 LevoNorgestrel and 6 saf T-coil were found. In 117 cases type of the IUD was not known. Period of time up to diagnosis of perforation was 20 days to 4 years (mean 12 months) in postpartum, 24 hours to 6 years (mean 9 months) in post-curretage and 4 days to 35 years (mean 10 months) in the intermenstrual group.

84.5% of patients were admitted due to pelvic and abdominal pain, 49.1% with abnormal bleeding, 10.3% with missed period and pregnancy. 5.2% of patients had no signs and symptoms.

Perforations of the uterus are of 3 types:

1) The IUD is completely free in the peritoneal cavity (171 cases);
2) The IUD is partly in the peritoneal cavity, partly embedded in the uterine wall (115 cases).
3) The IUD may intrude upon neighboring viscera (155 cases). Of the 155 reported cases, 85 concerned the omentum, 28 urinary bladder, 13 broad ligament, 12 appendix, 6 sigmoid colon, 4 rectum, 3 ileum, 2 ureter, 1 perirectal fat tissue, 1 Retzius space. Most of the IUDs causing visceral involvement were Copper IUD (43.2%) and Lippes Loop (20.6%). Also 7 Dalcon shields, 2 Nova T, 1 LevoNorgestrel were found. In 32 cases type of the IUD was not known. In one case, IUD was expelled spontaneously from the anus. Also in one case, 2 times IUD was inserted. The 1st one was ruptured. 2nd IUD was inserted supposing the 1st IUD was falled out.

Two death was occurred due to peritonitis in relation to uterine perforation, 2 months and 18 months after insertion. Types of IUD in that cases were Copper T and Lippes Loop.

IUD removed by laparoscopy in 178 (40.4%) patients and by laparotomy in 191 (43.3%) patients. Laparoscopic operation was turned to laparotomy in 24 (5.4%) patients. Appendectomy was done to 12 patients, total abdominal hysterectomy and bilateral salphingoopherectomy (TAH-BSO) to 2, omentectomy to 1, intestinal resection and re-

anastomosis to 5 and nephrectomy to 2 patients. Primary suture was done in 6 patients with cervical rupture, but laparotomy was necessary in 1 patient. In 38 (8.6%) women, IUD was removed by endoscopy. 18 cystoscopy, 8 suprapubic cystostomy, 3 vaginal cystotomy, 6 colpotomy, 1 culdoscopy, 1 proctoscopy, 1 sigmoidoscopy were done. Bladder stone was found in 3 patients who underwent cystoscopy and lithotripsy was applied. Also during 3 suprapubic cystostomy, bladder stones were extirpated.

Conclusion

The 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. The other benefits of the IUD are that its use is not associated with systemic side effects, is not related to coitus and once inserted, no further contraceptive efforts are required of the couple. But there are some risks associated with IUD use. One of the major health risk is perforation of the uterus. It is rare, but potentially fatal.

Various factors are responsible for uterine perforation by IUDs. Most perforations occur at the time of insertion. The manner of insertion, the consistency of the uterine wall and its position and the type of device and introducer used are important. Also insertion during the early postpartum period or during the period of lactational amenorrhoea, or in the case of an undiagnosed pregnant uterus or an acutely anteflexed or retroflexed uterus can be the cause.[4]

The risk of perforation is related mainly to the timing of insertion. Early postpartum insertion is easy and doesn't interfere with involution of the uterus. Most postpartum insertions are done in developing countries where access to health care is limited.[5] Clinicians can safely insert an IUD up to 48 hours after delivery. The IUD is inserted within 10 minutes of the delivery of the placenta, to minimize the risk of expulsion and perforation.[6] IUDs can be inserted manually after delivery of the placenta or with ring forceps. Investigators have looked at whether special longer inserters might facilitate insertion and decrease expulsion rates, but the results are not conclusive. Clinicians should insert the IUD high in the fundus during postpartum insertions to reduce the risk of expulsion. On most IUDs, such as the copper T 380A (whose string is 12 cm long), the string will not be visible in the vagina after a postpartum insertion. For IUDs with regular length strings, the strings should become visible in the vagina after several weeks. During the follow-up appointment the string should be cut. "Missing strings" are more common after postpartum insertion and require the clinician to determine by uterine probe or by imaging techniques whether the IUD is still in place.[5,7] IUD insertions through cesarean incisions are also safe.[8]

When the time elapsed after the last delivery until IUD insertion is considered, postplacental insertion and insertion after 6 months postpartum were found not to increase the risk of uterine perforation. However, IUD insertion 0-3 months postpartum increased the risk of uterine perforation (odds ratio (OR) 11.7, 95% confidence interval (CI) 2.8-49.2) as did insertions at 3-6 months postpartum (OR 13.2, CI 2.8-62). Increasing parity decreased the risk (OR 0.04, CI 0.01-0.1) and increasing number of abortions increased the risk (OR 2.1, CI 1.2-3.6).[9] Also in a study done by Heinonen 16 uterine rupture cases were examined. In 13 cases the IUD had been inserted within 5 months of delivery, in 1 case 7 months after delivery, and in 1 case after abortion. Nine of the women were lactating and 8 still had postpartum amenorrhea at the time of insertion. There is an increased risk of uterine perforation if the IUD is inserted postpartum during lactation and involution of the uterus. It is safer to postpone IUD insertion until 6 months after delivery.[9-11]

Early reports suggested an association between breastfeeding and IUD perforation. The latest data from large studies, however, indicate that breastfeeding is not likely associated with perforation. In 1983, a case-control study found that breastfeeding women had 10 times the risk of perforation than women who were not breastfeed-

ing.[12] Researchers have since argued that the study was flawed, however, and that the risk of perforation was more closely associated with the timing of insertion relative to the postpartum period than to breastfeeding.[8] The evidence from several large studies of prospectively collected data, on the other hand, indicates that breastfeeding probably does not increase the risk of perforation. Chi et al found no significant difference in the incidence of perforations among 3.043 breastfeeding versus 3.450 nonbreastfeeding women.[13] Another study of 559 breastfeeding and 590 nonbreastfeeding women found no reports of perforations in either group.[14]

In most cases, insertion of an IUD after a spontaneous or induced abortion is safe. The exceptions may be cases in which there is a pelvic infection or risk of infection, a septic abortion, severe injury to the genital tract, hemorrhaging or severe anemia. In cases of late abortion, because of the enlargement of the uterus after 16 weeks of pregnancy, special training is needed to insert an IUD. Alternatively, clinicians can wait 6 weeks after the abortion to insert the IUD.[6,15]

It is safe to insert an IUD at any time during the menstrual cycle.[6] The provider must be as certain as possible, however, that the woman is not pregnant. Traditionally, physicians believed it was best to insert an IUD either during or just after menstruation, when the cervical canal was hypothesized to be dilated, making insertion easier.[16] However, the cervix does not dilate during menses. In addition, the practice of IUD insertion during menstruation also ensured that the woman was not pregnant. Today's high-sensitivity urine tests can detect pregnancy early, making undetected pregnancy less of a problem.

In many countries, including the United States, nonphysicians insert IUDs.[6] With the appropriate training and experience, nonphysicians can safely and effectively perform this function. One study reviewed the insertion of the copper T 380A IUD by nonphysicians in clinics in Nigeria, Turkey and Mexico.[17] Women whose IUDs were inserted by a nonphysician were more likely to report that the insertion was pain-free, but were also more likely to have their IUDs removed for bleeding or pain. This may be the result of the providers being more sensitive to patients' menstrual complaints after the insertion or the result of improper insertions, but these explanations could not be confirmed. In addition, more expulsions occurred in the nonphysician insertion group. The researchers speculate that this difference may be due to a relative lack of experience among the nonphysician providers, since expulsion rates are generally lower among providers experienced in inserting IUDs.

The best prevention of uterine perforation is a meticulous and well executed insertion technique, done only by an experienced operator and after a careful pelvic examination. The most important part of the decision to use an IUD is proper patient selection. It is critical that the physician know the patient's history and be aware of patient characteristics that increase the risk for complications. The distance to the top of the fundus can be measured by using a sound; it should be between 6 and 9 cm.[18,19] The ACOG Technical Bulletin states that a uterine cavity smaller than 6 cm or larger than 9 cm is a contraindication to IUD placement; however, the prescribing information for the ParaGard indicates that only uteri smaller than 6 cm are associated with an increased risk of adverse reactions.[19,20] Studies have shown that cervical traction in a caudal direction reduces the median uterocervical angle, from 75 ∞ to 10 ∞ and moderate cervical traction straightens the uterus, and the routine use of a tenaculum theoretically should make insertion of an IUD safer.[21] A prerequisite, however, is that traction should be applied until the insertion of the IUD has been completed. In addition, clinical experience shows that access to the uterus, and straightening of the utero-cervical axis, is facilitated by using the lithotomy position, which should be recommended for all IUD/IUS insertions.

Most physicians have not offered the IUD to nulliparous patients, fearing the risk of infection-related infertility; however, if the patient has no contraindications and understands the risks, many physicians have found the IUD an excellent con-

traceptive for these patients.[22,23] IUD can be controlled 4 to 6 weeks after the IUD insertion, to make sure it is place. Patients must be advised to check the string of IUD after every period. She should be able to feel the thin, plastic string coming out of the opening of the cervix. It may coil around the cervix, which can make it difficult to find. If patient cannot feel the string or the rigid end of the IUD, she must advised to call her health professional. Perforation is often suspected or diagnosed when the IUD string is no longer visible at the external os. Although patients may have signs and symptoms suggestive of perforation (pain or bleeding), some are apparently asymptomatic. So women having IUD should strictly advised for regular gynecologic examination. IUD must be controlled regularly, one and 3 months after insertion and yearly thereafter.

Neither perforation, diagnosed either at insertion or later, nor translocation of the IUS has been recorded in large international multicentre clinical trials published to date.[24,25] The highest rate of perforation that has been observed is 1.4/1000, but this rate fell to approximately 1/1000 with increasing experience.[26] At least one perforation has occurred, which was attributed to migration of the IUS.[27] However, migration seems only possible if a partial perforation occurred at the time of insertion. As the IUS is frameless and flexible, it is unlikely that the device is forced through the uterine wall by uterine contractions, as has been suggested as a possible mechanism of perforation with framed IUDs.[26]

In a review of 356 cases of uterine rupture, 352 cases were suitable for analysis. Of these there were 53 unusual complications involving the intestinal tract, bladder, and so forth. There were 299 cases of simple perforation involving the uterus only, of which 255 were complete and 44 were partial. The mechanism of cervical perforation appears to depend on the presence of an IUD with a dependent limb in its design.[28]

In Bollnas, Sweden, three perforations occurred in 1 156 insertions of the Copper-7, and in New York, USA, six perforations occurred in 1 153 insertions of the Copper-T. Cervical perforation seems to be a special feature of the Copper-T, while the Copper-7 tends to perforate through the uterine wall.[29]

The risk of uterine perforation by Copper T 380 IUDs is only 0.4 per 1,000 women and the risk of cervical perforation is 0.6 per 1.000, making a total perforation rate of approximately 1.0 per 1.000, or one woman in 1.000 insertions.[30] Perforation is a rare complication of LNG IUS use (1/1000) and Lippes loop (0.6/1000).[31,32]

Perforated IUDs should be removed even if considered innocuous, although this is a matter still debated by the specialists. Cu IUDs must be removed as early as possible following diagnosis of perforation. Health consequences of untreated perforations with Cu IUDs are greater than with inert devices like Lippes Loop.[2] Intraperitoneal IUDs do not necessarily produce symptoms but may intrude on neighboring viscera such as the bladder or intestinal tract.[33] Copper containing IUDs are known to cause irritation and although translocation may have occured at the time of insertion, visceral penetration was almost certainly a later event.[3]

While the small number of IUD-related deaths is insufficient to demonstrate an increased mortality rate associated with any specific type of device, the overall rate of IUD-related mortality appears to be low compared with the mortality rates associated with pregnancy and other forms of contraception.[34] Five fatalities were reported in the 6-month study period by the 16.994 physicians who responded by mail and the documenting details of each of these cases supported the suggestion that an IUD had contributed to the death. Four of the 5 terminal illnesses involved severe infection; 2 of these 4 infections involved a pregnancy. The devices used by these women were 2 Lippes Loops, 2 Saf-T-Coils, and 1 Dalkon Shield. These 5 reports imply a minimum IUD-related mortality rate of approximately 3 per million woman-years of use.

Before deciding on the best method for removal it is necessary to know the type of perfora-

tion and the location of the ectopic IUD. Removal of an IUD can be performed through endoscopic, laparoscopic, laparotomy procedures. Of all perforations of the uterus, the completely perforated IUD is the type most often encountered, most commonly described, and most easily removed.[33]

Uterine perforation due to IUD is an important pathology with serious complications. IUD can be introduced safely and effectively by appropriate training and experience and it must be controlled regularly in order to detect this complication early. If the IUD is in an extrauteral position, it should be removed to avoid possible complications; such as severe damage to the viscera (i.e. bowel, kidney) and/or peritonitis and death.

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