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MIGRATION OF INTRAUTERINE DEVICE INTO FREE ABDOMINAL CAVITY

*D.A. Rakhmonov¹, F.Sh. Rashidov¹, E.L. Kalmykov², M.M. Marizoeva³,
O.B. Bobdjonova², F.B. Bokiev¹, Sh.Sh. Amonov¹, O.N. Sadriev¹*

Republican scientific center of cardiovascular surgery
the Ministry of health and protection Republic of Tajikistan,
Sanoi str., 33, 734003, Dushanbe city, Republic of Tajikistan (1)
Tajik state medical university named after Avicenna,
Rudaki av., 139, 734003, Dushanbe city, Republic of Tajikistan (2)
City Maternity Hospital №2 Health Department of Dushanbe City,
Narzikulov str., 8, 734025, Dushanbe city, Republic of Tajikistan (3)

The aim: demonstration of our experience of surgical treatment of patients with migrated intrauterine device (IUD) into the abdominal cavity.

The results of surgical treatment of migrated IUDs in the pelvic cavity are summarized in 17 women. The average age of the patients was 33,2±3,4 years. The timing of implantation of the IUDs varied from 10 days to 24 months. In all cases, the intra operational finding was T-shaped a copper device.

The reason behind the women's consultation was an increase in pain syndrome in the lesser pelvis (n=15), dysuric phenomenon (n=1) and the onset of pregnancy (n=1). Perforation of the uterus and migration of the spiral occurred from 10 days to 2 years after its implantation. All patients were operated laparoscopically.

The average duration of operations was 45,5±10,5 minutes. In the postoperative period there were no complications from the pelvic organs and postoperative wounds. The period of hospitalization of patients was 3,5±0,7 days. In all cases there was a regression of clinical signs and recovery. In one pregnant patient (gestation period 5-6 weeks) the pregnancy proceeded without particular pathological abnormalities and resulted in the birth of a full-term child.

Laparoscopic removal of the IUD migrating from the uterine cavity to the abdominal cavity is the method of choice in the treatment of this group of patients, avoiding development of intra- and postoperative complications and a shorter length of stay in the hospital. The effectiveness of the procedure reaches 100%. The most common cause of complication of the IUD is the perforation of the uterus during its implantation.

Keywords: *intrauterine device, migration, perforation, pelvic organs, pregnancy.*

Use of intrauterine devices (IUDs) is one of the most widespread and effective methods of contraception. About 10% of females in industrial countries and 16,5% of females in developing countries resort to IUD to prevent unintended pregnancy [1].

The main reasons for a wide spread of the given method of contraception are possi-

bility for a long-term use, absence of potential harm to an organism, return to fertile state after removal of IUD, simplicity of insertion and a relatively low cost [1-3].

However, in 1,3-1,6/1000 cases IUD may migrate into the free abdominal cavity and into the cavity of small pelvis, as well as into the urinary bladder or sigmoid colon

with formation of vesicouterine or intestinouterine fistulas [1, 4-6]. The cause of movement of IUD out of uterus is considered to be perforation of the uterus during IUD insertion which may remain undiagnosed for a long time. The device may also migrate under the endometrium or into the myometrium with frequent development of inflammatory processes and pelvalgia [1, 6].

The aim of the given report is demonstration of the authors' experience in surgical treatment of female patients with IUD migrated into the abdominal cavity.

Materials and Methods

In the given work experience of surgical treatment of 17 female patients with migration of IUD into the abdominal cavity (2006-2015) in the endosurgery department of Republican Scientific Center of Cardiovascular Surgery is analyzed. The average age of patients was $33,2 \pm 3,4$ years. Duration of the period after insertion varied from 10 days to 24 months. In all cases at operation T-shaped copper device was found. The last delivery date before insertion varied from 67 to 215 days. Fifteen patients (88,2%) had three deliveries in history, two patients had four deliveries, all were vaginal deliveries. Two patients had legal abortions in history, two patients had past adnexitis treated by conservative method. One patient had a history of operation for acute appendicitis.

Topical diagnosis of IUD migration was performed using ultrasound examination and plain radiography of pelvis and abdominal cavity.

All data obtained in the investigation were subject to statistical processing with determination of the average meaning (M) and of root-mean-square error (m).

Results and Discussion

All female patients were directed to the hospital by a gynecologist doctor. It should be noted that 12 patients had not referred to gynecologist after insertion and had not been observed, and IUD location had not been controlled. The reason for referral of these patients to women's consultation was intensification of pain syndrome in the small pelvis (n=15) hardly removed by spasmolytics, dysuric disorder (n=1) and pregnancy (n=1). Patients referred to a doctor with signs of

IUD dislocation out of the uterus in 10 to 24 months after «implantation». Study of history, collective discussion with gynecologists who had inserted the IUD, analysis of the operation finding confirmed the cause for dislocation of the device into the abdominal cavity in 15 patients being perforation of the uterus. So, six patients were delivered by gynecologists in 10 days to 1 month after «implantation» with pain syndrome persisting from the day of the procedure, and with signs of irritation of the peritoneum in the lower abdomen.

The rest of the patients noted abnormal state of health soon after IUD «implantation» and received treatment with a short-term effect. 12 Patients completely ignored control examination after «implantation» and only enhancement of pain syndrome made them visit a doctor in the period from 6 months to 2 years.

The main diagnostic method that permitted to identify perforation of uterine wall and migration of IUD was ultrasound examination which located IUD in the region of the right uterine adnexa (on the right border of uterus) in 8 patients, in the region of the left uterine adnexa (on the left border of uterus) in 4, in the orifice of the left uterine tube in 2 and in the region of the front wall of the uterine body in 3 patients. IUD was visualized in ultrasound examination as a hyperechoic relatively long formation with acoustic shadows (figs. 1, 2).

In 10 cases plain radiography of the abdominal cavity and pelvis (figs. 3, 4) was performed which confirmed dislocation of IUD out of the cavity of small pelvis.

Use of two methods of topical diagnosis was justified by a necessity to reach a more definite diagnosis. All patients were operated by a method of laparoscopy (figs. 4, 5).

Operations were performed with three access ports. In all cases an adhesive process with different extent of evidence was noted in the small pelvis. In 5 patients IUD was removed from the cavity of the formed abscess on the right border of uterus. In case of frontal localization of IUD ultrasound examination visualized an evident adhesive process in the anterior culdesuc, after dissection of adhesions the IUD was identified and extracted.



Fig.1. Ultrasound picture of migrated IUD. Dislocation of IUD is identified on the right border of uterus



Fig. 2. Ultrasound picture of migrated IUD. The end of the device is visualized inside the left uterine tube



Fig. 3. Plain radiography of pelvis covering the lower part of abdominal cavity. Migrated IUD is indicated by the arrow



Fig. 4. Plain radiography of pelvis. IUD dislocation is noted on the left border of uterus

In two cases IUD was removed from the lumen of the left uterine tube.

Some peculiarities of removal of IUD should be mentioned. If in revision of the small pelvis parts of IUD were visible, IUD was removed with minimal dissection of surrounding adhesions. In the opposite situation, at first a search for IUD was made on the basis of ultrasound examination data with cau-

tious dissection of adhesions and instrumental palpation of this zone. In case of formation of abscess it was opened and aspirated, and after removal of IUD the cavity was opened for adequate emptying. In all cases the volume of adhesiolysis was selected individually. A search for a perforation hole in the uterus is not recommended by us.



Fig. 5. Intraoperative photo. A stage of revision of small pelvis. Removal strings of migrated IUD are seen

The cavity of small pelvis was drained within 1-2 days, and in case of abscess – 4-6 days. Antibiotics were administered only in case of abscesses and signs of inflammation. No intra- and postoperative complications were observed. The operation lasted from 35 to 70 minutes, on average $45,5 \pm 10,5$ min. Duration of the operation was determined by dissection of the formed adhesions, localization and removal of the IUD and in one case by pregnancy. Patients were discharged on the 2nd and 6th day, with average hospitalization period $3,5 \pm 0,7$ days.

All patients were discharged without complications for further observation by gynecologist and surgeon. In a pregnant female patient (gestation 5-6 weeks) pregnancy proceeded without any special pathological abnormalities and ended in birth of a full-term child.

After perforation of uterine wall an intrauterine device in most cases migrates into the small pelvis. Such complications are associated with pelvalgias, intestinal obstruction, bleeding, peritonitis and local abscesses [6]. In some cases the first manifestation suggestive of IUD migration is the onset of pregnancy [7, 8] that was also noted in one of our observations.

According to some authors, migration of IUD into the abdominal cavity and small

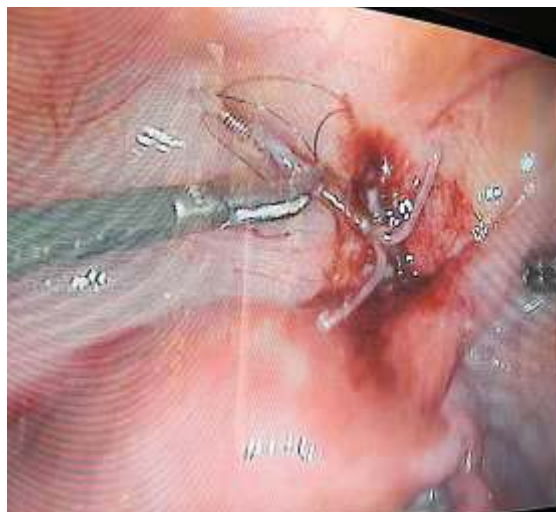


Fig. 6. Intraoperative photo. Complete mobilization of migrated IUD from the region of the left uterine tube

pelvis occurs in patients with a local aseptical inflammation of the uterine wall and development of its decubitus that finally leads to perforation [3, 9]. Besides, perforation may result from traumatizing the uterine wall by a coarse manipulation during IUD implantation, or from a uterine pathology (bicornuate uterus, small uterine fundus) [9, 10]. One of the known causes of perforation of the uterine wall and IUD migration is believed to be a low level of estrogen in the period of lactation and in the nearest postpartum period with the related dystrophic changes in the uterine wall leading to the given complication [1, 5, 7]. In the presented series of observations it should be noted that all patients had at least two deliveries in history, two cases of abortions, and inflammatory diseases of adnexa in two observations. However, these observations are too scarce to make any reliable conclusions about risk factors.

The main diagnostic method for IUD migration is ultrasound examination that permits to obtain necessary information about the condition of uterus, localization of the device and presence of complications. In more complicated clinical cases CT scanning and MRI are used that possess the highest diagnostic accuracy.

According to WHO recommendations, all migrated IUD are to be removed

by laparoscopic techniques or by laparotomy, the choice depending on the presence of complications [12]. In the absence of any serious complications IUDs are extracted mainly by laparoscopic method. In case of intestinal fistulas, peritonitis, bleed-

ings, abscesses and coarse scarring processes, IUD is removed from laparotomy access [2, 3, 5, 6].

In Table 1 complication rates of laparoscopic techniques and laparotomy are given according to the literature data.

Table 1

Rate of Postoperative Complications

Authors/year	Number of observations	Laparoscopy	Laparotomy	Postoperative complications
Adiyeke M. et al. (2015) [2]	27	17 (63%)	10 (37%)	No data
Ertopcu K. et al. (2015) [5]	36	18 (50%)	18 (50%)	5 (14%)
Kimberly A. Kho, Dina J. (2014) [3]	37	32 (86,5%)	5 (13,5%)	1 (2,7%)
Soydinc H.E. et al. (2013) [6]	21	66,7%	33,3%	38%
Cetinkaya K. et al. (2011) [13]	18	11 (61%)	7 (39%)	0

As is seen from the table, one of the main methods for removal of IUD out of the abdominal cavity is laparoscopy. Here, the rate of postoperative complications with different operation techniques is from 0 to 38%. Of 17 observations presented by us not in a single observation any intra- and postoperative complications were noted.

According to K. Ertopcu et al (2015), in 18 (50%) patients frequency of conversion with laparoscopic techniques was 22%, and with minilaparotomy – 6% which was associated with emerged bleeding (n=1) and with difficulties of visualization of IUD (n=5) [5]. However, the authors did not note any statistically reliable difference in the rate of postoperative complications vs. selected operational method and access.

Le A. Shan et al (2016) and A. Madena et al (2016) successfully used laparoscopy in combination with cystoscopy or rectoscopy in treatment for uterovesical and uterointestinal fistulas [14, 15].

According to the data of United Nations Development Program, pregnancy with use of

intrauterine contraception occurs in 1-2 of 100 women per year [11]. The onset of pregnancy with the IUD has negative consequences both for fetus (low weight at birth) and for female's organism (preterm deliveries, chorioamnionitis, spontaneous abortion) [7, 8].

In our investigation pregnancy occurred only in one patient, the gestation period was 5-6 weeks. In this case we managed to successfully remove IUD with preservation of pregnancy which further proceeded normally without significant pathologies and ended in birth of a living full-term infant.

Conclusion

Laparoscopic removal of intrauterine devices migrated into the abdominal cavity is a method of choice in treatment of the given group of female patients permitting to avoid intra- and postoperative complications and to reduce duration of stay in hospital. The effectiveness of the procedure reaches 100%. The most common cause of migration of intrauterine devices into the abdominal cavity is considered by us to be perforation of uterus during implantation of the device.

No conflict of interests.

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Rakhmonov D.A. – PhD, Director of Republican Scientific Center of Cardiovascular Surgery of Ministry of Health and Social Protection of Population of Republic of Tajikistan.

Rashidov F.Sh. – PhD, Senior Research Assistant of Endosurgery Department of Republican Scientific Center of Cardiovascular Surgery of Ministry of Health and Social Protection of Population of Republic of Tajikistan.

Kalmykov E.L.– PhD, Director of Center of Evidence-Based Medicine of Abu Ali ibn Sina (Avicenna) Tajik State Medical University

Marizoeva M.M. – obstetrics and gynecology doctor in Municipal Maternity House №2, Dushanbe Health Administration.

Bobdjonova O.B. – resident doctor of Obstetrics and Gynecology Department №2 of Abu Ali ibn Sina (Avicenna) Tajik State Medical University.

Amonov Sh. Sh. – PhD, operating surgeon of Endosurgery Department of Republican Scientific Center of Cardiovascular Surgery of Ministry of Health and Social Protection of Population of Republic of Tajikistan.

Bokiev F.B. – PhD, Head of Endosurgery Department of Republican Scientific Center of Cardiovascular Surgery of Ministry of Health and Social Protection of Population of Republic of Tajikistan.

Sadriev O.N. – PhD, Leading Research Scientist of Republican Scientific Center of Cardiovascular Surgery of Ministry of Health and Social Protection of Population of Republic of Tajikistan.

E-mail: sadriev_o_n@mail.ru