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Contents

Thrice Monthly Volume 10 Number 15 May 26, 2022

EDITORIAL

- 4713 Diet and intestinal bacterial overgrowth: Is there evidence?

Souza C, Rocha R, Cotrim HP

MINIREVIEWS

- 4717 Definition and classification of acute-on-chronic liver diseases

Zhang YY, Meng ZJ

- 4726 Management of neurosurgical patients during coronavirus disease 2019 pandemics: The Ljubljana, Slovenia experience

Velmar T, Bosnjak R

ORIGINAL ARTICLE

Clinical and Translational Research

- 4737 Glycolytic and fatty acid oxidation genes affect the treatment and prognosis of liver cancer

Zou JY, Huang YJ, He J, Tang ZX, Qin L

- 4761 Detection of a novel panel of 24 genes with high frequencies of mutation in gastric cancer based on next-generation sequencing

Zeng HH, Yang Z, Qiu YB, Bashir S, Li Y, Xu M

Case Control Study

- 4776 Outcomes of cervical degenerative disc disease treated by anterior cervical discectomy and fusion with self-locking fusion cage

Zhang B, Jiang YZ, Song QP, An Y

- 4785 Impact of COVID-19 pandemic on clinicopathological features of transplant recipients with hepatocellular carcinoma: A case-control study

Akbulut S, Sahin TT, Ince V, Yilmaz S

Retrospective Study

- 4799 Risk factors and optimal predictive scoring system of mortality for children with acute paraquat poisoning

Song Y, Wang H, Tao YH

- 4810 Application effect of thoracoscopic tricuspid valvuloplasty in geriatric patients with tricuspid valve disease

Jiang W, Long XM, Wei KQ, Li SC, Zhang Z, He BF, Li H

- 4818 Endoscopic ultrasonography in the evaluation of condition and prognosis of ulcerative colitis

Jin RF, Chen YM, Chen RP, Ye HJ

- 4827** Dynamic interaction nursing intervention on functional rehabilitation and self-care ability of patients after aneurysm surgery

Xie YE, Huang WC, Li YP, Deng JH, Huang JT

Clinical Trials Study

- 4836** Validations of new cut-offs for surgical drains management and use of computerized tomography scan after pancreatoduodenectomy: The DALCUT trial

Caputo D, Coppola A, La Vaccara V, Passa R, Carbone L, Ciccozzi M, Angeletti S, Coppola R

Observational Study

- 4843** Psychosocial adaptation and influencing factors among patients with chemotherapy-induced peripheral neuropathy

Zhou X, Wang DY, Ding CY, Liu H, Sun ZQ

META-ANALYSIS

- 4856** Outcome of the efficacy of Chinese herbal medicine for functional constipation: A systematic review and meta-analysis

Lyu Z, Fan Y, Bai Y, Liu T, Zhong LL, Liang HF

CASE REPORT

- 4878** Familial gastrointestinal stromal tumors with *KIT* germline mutation in a Chinese family: A case report

Yuan W, Huang W, Ren L, Xu C, Luan LJ, Huang J, Xue AW, Fang Y, Gao XD, Shen KT, Lv JH, Hou YY

- 4886** Nonfunctional pancreatic neuroendocrine tumours misdiagnosed as autoimmune pancreatitis: A case report and review of literature

Lin ZQ, Li X, Yang Y, Wang Y, Zhang XY, Zhang XX, Guo J

- 4895** Sudden deafness as a prodrome of cerebellar artery infarction: Three case reports

Li BL, Xu JY, Lin S

- 4904** Importance of abdominal X-ray to confirm the position of levonorgestrel-releasing intrauterine system: A case report

Maebayashi A, Kato K, Hayashi N, Nagaishi M, Kawana K

- 4911** Bedside ultrasonic localization of the nasogastric tube in a patient with severe COVID-19: A case report

Zhu XJ, Liu SX, Li QT, Jiang YJ

- 4917** Paradoxical herniation after decompressive craniectomy provoked by mannitol: A case report

Du C, Tang HJ, Fan SM

- 4923** Targeted next-generation sequencing identifies a novel nonsense mutation in ANK1 for hereditary spherocytosis: A case report

Fu P, Jiao YY, Chen K, Shao JB, Liao XL, Yang JW, Jiang SY

- 4929** Nonfunctional bladder paraganglioma misdiagnosed as hemangioma: A case report

Chen J, Yang HF

- 4935** Special type of Werneck syndrome in midbrain infarction: Four case reports
Yang YZ, Hu WX, Zhai HJ
- 4942** Primary extraskeletal Ewing's sarcoma of the lumbar nerve root: A case report
Lei LH, Li F, Wu T
- 4949** Yellow nail syndrome accompanied by minimal-change nephrotic syndrome: A case report
Zhang YN, Wang MH, Yu WC, Cheng W, Cong JP, Huang XP, Wang FF
- 4957** Total femur replacement with 18 years of follow-up: A case report
Yang YH, Chen JX, Chen QY, Wang Y, Zhou YB, Wang HW, Yuan T, Sun HP, Xie L, Yao ZH, Yang ZZ
- 4964** Male metaplastic breast cancer with poor prognosis: A case report
Kim HY, Lee S, Kim DI, Jung CS, Kim JY, Nam KJ, Choo KS, Jung YJ
- 4971** CD8-positive indolent T-Cell lymphoproliferative disorder of the gastrointestinal tract: A case report and review of literature
Weng CY, Ye C, Fan YH, Lv B, Zhang CL, Li M
- 4985** Bone flare after initiation of novel hormonal therapy in patients with metastatic hormone-sensitive prostate cancer: A case report
Li KH, Du YC, Yang DY, Yu XY, Zhang XP, Li YX, Qiao L
- 4991** Postoperative infection of the skull base surgical site due to suppurative parotitis: A case report
Zhao Y, Zhao Y, Zhang LQ, Feng GD
- 4998** Blunt aortic injury-traumatic aortic isthmus pseudoaneurysm with right iliac artery dissection aneurysm: A case report
Fang XX, Wu XH, Chen XF
- 5005** Extensive complex thoracoabdominal aortic aneurysm salvaged by surgical graft providing landing zone for endovascular graft: A case report
Jang AY, Oh PC, Kang JM, Park CH, Kang WC
- 5012** Gastric heterotopia of colon found cancer workup in liver abscess: A case report
Park JG, Suh JI, Kim YU
- 5018** Clinical manifestations and gene analysis of Hutchinson-Gilford progeria syndrome: A case report
Zhang SL, Lin SZ, Zhou YQ, Wang WQ, Li JY, Wang C, Pang QM
- 5025** Neurocutaneous melanosis with an intracranial cystic-solid meningeal melanoma in an adult: A case report and review of literature
Liu BC, Wang YB, Liu Z, Jiao Y, Zhang XF
- 5036** Metastasis of liver cancer to the thyroid after surgery: A case report
Zhong HC, Sun ZW, Cao GH, Zhao W, Ma K, Zhang BY, Feng YJ

- 5042** Spontaneous liver rupture following SARS-CoV-2 infection in late pregnancy: A case report
Ambrož R, Stašek M, Molnár J, Špička P, Klos D, Hambálek J, Skanderová D
- 5051** Carotid blowout syndrome caused by chronic infection: A case report
Xie TH, Zhao WJ, Li XL, Hou Y, Wang X, Zhang J, An XH, Liu LT
- 5057** Is repeat wide excision plus radiotherapy of localized rectal melanoma another choice before abdominoperineal resection? A case report
Chiu HT, Pu TW, Yen H, Liu T, Wen CC
- 5064** Metaplastic breast cancer with chondrosarcomatous differentiation combined with concurrent bilateral breast cancer: A case report
Yang SY, Li Y, Nie JY, Yang ST, Yang XJ, Wang MH, Zhang J
- 5072** Rare solitary splenic metastasis from a thymic carcinoma detected on fluorodeoxyglucose-positron emission tomography: A case report
Tsai YH, Lin KH, Huang TW
- 5077** Type A aortic dissection following heart transplantation: A case report
Zeng Z, Yang LJ, Zhang C, Xu F
- 5082** Catheter-related infections caused by *Mycobacterium abscessus* in a patient with motor neurone disease: A case report
Pan SF, Zhang YY, Wang XZ, Sun JJ, Song SL, Tang YR, Wang JL
- 5088** Clear aligner treatment for a four-year-old patient with anterior cross-bite and facial asymmetry: A case report
Zou YR, Gan ZQ, Zhao LX
- 5097** Knot impingement after arthroscopic rotator cuff repair mimicking infection: A case report
Kim DH, Jeon JH, Choi BC, Cho CH
- 5103** Solitary primary pulmonary synovial sarcoma: A case report
He WW, Huang ZX, Wang WJ, Li YL, Xia QY, Qiu YB, Shi Y, Sun HM
- 5111** Anesthetic management for intraoperative acute pulmonary embolism during inferior vena cava tumor thrombus surgery: A case report
Hsu PY, Wu EB
- 5119** Delayed diagnosis of arytenoid cartilage dislocation after tracheal intubation in the intensive care unit: A case report
Yan WQ, Li C, Chen Z

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Importance of abdominal X-ray to confirm the position of levonorgestrel-releasing intrauterine system: A case report

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Abstract

BACKGROUND

Levonorgestrel-releasing intrauterine systems (LNG-IUSs) gradually release levonorgestrel into the uterus and is effective against hypermenorrhoea and dysmenorrhea. Complications associated with the insertion include expulsion, displacement, and uterine perforation. Ultrasonic identification of copper intrauterine devices (IUDs) is possible due to echogenicity from the copper coils. However, the barium sulfate coatings of LNG-IUSs do not always provide hyperechoic images. Both barium sulfate and copper are radiopaque and clearly identifiable on X-ray. Thus, X-ray imaging is required to locate LNG-IUSs.

CASE SUMMARY

A 46-year-old woman with hypermenorrhoea due to submucosal myomas was treated with LNG-IUS at another hospital. Three LNG-IUS insertions had apparently been followed by spontaneous expulsion, although objective confirmation using imaging was not performed. The patient was referred to our institution for surgery. At the first visit, there appeared to be no device in the uterus, and none was observed on transvaginal ultrasound. However, two LNG-IUSs were observed in the pelvis on abdominal plain X-rays prior to surgery. Hysteroscopic myomectomy was performed, and the two LNG-IUSs were found to have perforated the myometrium. The devices were safely removed during surgery, and the submucosal myomas were also removed. The perforated section of the myometrium was minimal+ADs- therefore, a repair operation was not required.

CONCLUSION

Plain abdominal X-rays facilitate the determination of whether an LNG-IUS is in the uterine cavity. Therefore, it is important to confirm a device's location,

regardless of whether spontaneous expulsion is suspected, prior to inserting another device.

Key Words: Hysteroscope; Intrauterine devices; Levonorgestrel-releasing intrauterine system; Submucosal myoma; Uterine perforation; Case report

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Core Tip: Levonorgestrel-releasing intrauterine systems (LNG-IUS) is the effective against hypermenorrhea and dysmenorrhea. In many cases, like previous devices, we misunderstand that the device can be recognized by ultrasound. In this case, the diagnosis was that there was no device in the uterus, however, there were two devices that were displaced and caused myometrium damage. Plain abdominal X-ray is important to confirm the position of LNG-IUS.

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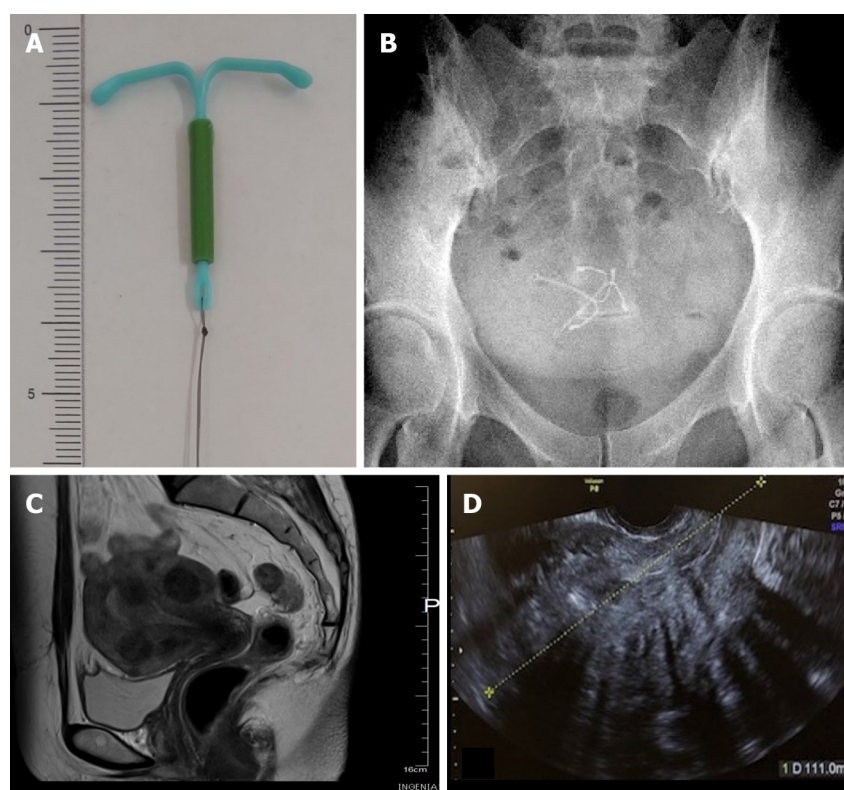
INTRODUCTION

Levonorgestrel-releasing intrauterine system (LNG-IUS) is a T-shaped device matching the morphology of the uterine cavity (Figure 1A). Levonorgestrel contained in the frame is gradually released into the uterus at a rate of 20 µg per day. The released levonorgestrel exerts a local progestin action in the uterus. These devices are now widely available as a treatment for hypermenorrhoea and dysmenorrhea[1,2]. The rate of hypermenorrhoea improvement is reportedly 84%[1]. The rate of dysmenorrhea improved on the visual analog scale from 7.7 ± 1.3 before use to 3.5 ± 1.8 one year after use[2]. LNG-IUS can be inserted into the uterine cavity without anaesthesia in an outpatient setting, and a single application is effective for approximately 5 years. In addition, indications for hypermenorrhoea and dysmenorrhea were approved, insurance coverage was authorized in 2014, and the demand has since been rapidly increasing. However, whether medical personnel have up-to-date knowledge regarding proper use and complications has raised concerns. Uterine perforation is one of the serious complications associated with intrauterine devices (IUDs). The incidence of LNG-IUS uterine perforation is 1.4 per 1000 insertions [3]. Partial perforation is rare but is regarded as an associated risk. Multiple imaging modalities can be used to assess IUDs. Ultrasound is excellent for the initial evaluation. Structurally, an IUD is a T-shaped polyethylene frame with a copper wire or LNG around the stem. Copper wires are opaque and hyperechoic on ultrasound. Ultrasonic identification of copper IUDs is possible due to echogenicity from the copper coils. However, LNG-IUS coated with barium sulfate does not always provide a high echo image. Thus, LNG-IUS can be difficult to detect by ultrasound[4]. In addition, the ultrasound image is unclear in the presence of myoma and intestinal gas artefacts. On X-rays, both barium sulfate and copper are radiopaque and clearly identifiable[5]. The location of the LNG-IUS can thus be confirmed by X-ray. Almost half (48%) of patients with uterine perforation were asymptomatic. IUS were discovered incidentally or following a clinical work-up for symptoms[6]. Case reports have described the appearance of clear symptoms corresponding to IUS perforation of the uterus and entry into the abdominal cavity, which in turn leads to adhesions, intestinal obstruction, and abscess formation. To date, no reports have presented images showing how the displaced device affects the muscle layer or demonstrating partial perforation using a hysteroscope, which may illustrate the process leading to complete uterine perforation. We present a case with partial perforation of the myometrium, which was thought to have been caused by the insertion of a second LNG-IUS, without objective confirmation of the status of the first LNG-IUS by imaging, in response to the patient's self-report of spontaneous expulsion.

CASE PRESENTATION

Chief complaints

The patient was 46 years old and gravida 2, para 2 (2g2p). The patient had been treated for multiple submucosal uterine myomas, hypermenorrhoea, and anaemia by a previous physician starting two years prior to the current presentation.



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Figure 1 Photographic and imaging findings of levonorgestrel-releasing intrauterine system. A: The T frame and thread are made of polyethylene, and barium sulfate is added to the T frame. The vertical portion of the cylinder contains Levonorgestrel-releasing intrauterine system (LNG-IUS); B: Abdominopelvic radiograph demonstrates the two LNG-IUSs in the pelvis and that both devices are rotated away from a normal orientation; C: Axial T2-weighted MR image through the pelvis before LNG-IUS insertion. Multiple fibroids are observed in the mucosa and muscle layer; D: Transvaginal ultrasonography at the first visit to our hospital. At this time, two LNG-IUSs were inserted, but due to multiple fibroids, it was difficult to confirm the device location by ultrasound.

History of present illness

The previous physician was aware that the patient had undergone prior LNG-IUS insertions and that these devices had been spontaneously expelled three times over a two-year period. At the time of referral, a third LNG-IUS was inserted; however, the patient was immediately referred to our institution for surgery after both she and the medical professional became aware that spontaneous expulsion along with massive haemorrhage had occurred. Since the previous physician was aware that the LNG-IUS had been inserted and that there had been three prior expulsions of the device, the patient was referred to us based on the assumption that no devices were present in the uterus.

History of past illness

The patient had a medical history of breast cancer at the age of 45, which had been treated by total mastectomy. Postoperative adjuvant therapy was not administered, and the patient is currently receiving follow-up and has not developed recurrence.

Personal and family history

There is no family history.

Physical examination

The findings at the time of scheduled hospitalization were as follows: height 168 cm, weight 61 kg, body mass index 21, blood pressure 139/89 mmHg, pulse rate 82 beats/min, respiration rate 20 times/min, and body temperature 36.0 °C. The patient had no abdominal pain and no abnormal bleeding.

Laboratory examinations

Blood test findings were as follows: WBC, 4600/uL; Hb, 11.6 g/dL; Plt, 335000/uL, T-bil, 0.39 mg/dL; AST, 16 U/L; ALT, 13 U/L; LDH, 169 U/L; BUN, 10.2 mg/dL; Cr, 0.65 mg/dL; Na, 141 mEq/L; K, 4.1 mEq/L; Cl, 104 mEq/L; and CRP, 0.01 mg/dL.

Imaging examinations

During examination at our institution for initial diagnosis, the uterine cavity length was 10 cm, and on

transvaginal ultrasound images, multiple uterine myomas were identified, including submucosal uterine myomas up to 4 cm in size (Figure 1C and D). Ultrasound images of the uterine cavity were unclear due to the presence of multiple myomas, and the LNG-IUS could not be visualized inside the uterus. During the speculum examination, the thread for pulling out the LNG-IUS was not found. During pelvic examination and ultrasound, no device was visualized in the uterus+ADs- however, two LNG-IUSs were observed in the pelvis on abdominal plain X-rays prior to surgery (Figure 1A and B), such that both intrauterine LNG-IUSs were suspected to be located in the uterus.

FINAL DIAGNOSIS

Partial perforation of the uterine myometrium, duplicate insertion of LNG-IUS.

TREATMENT

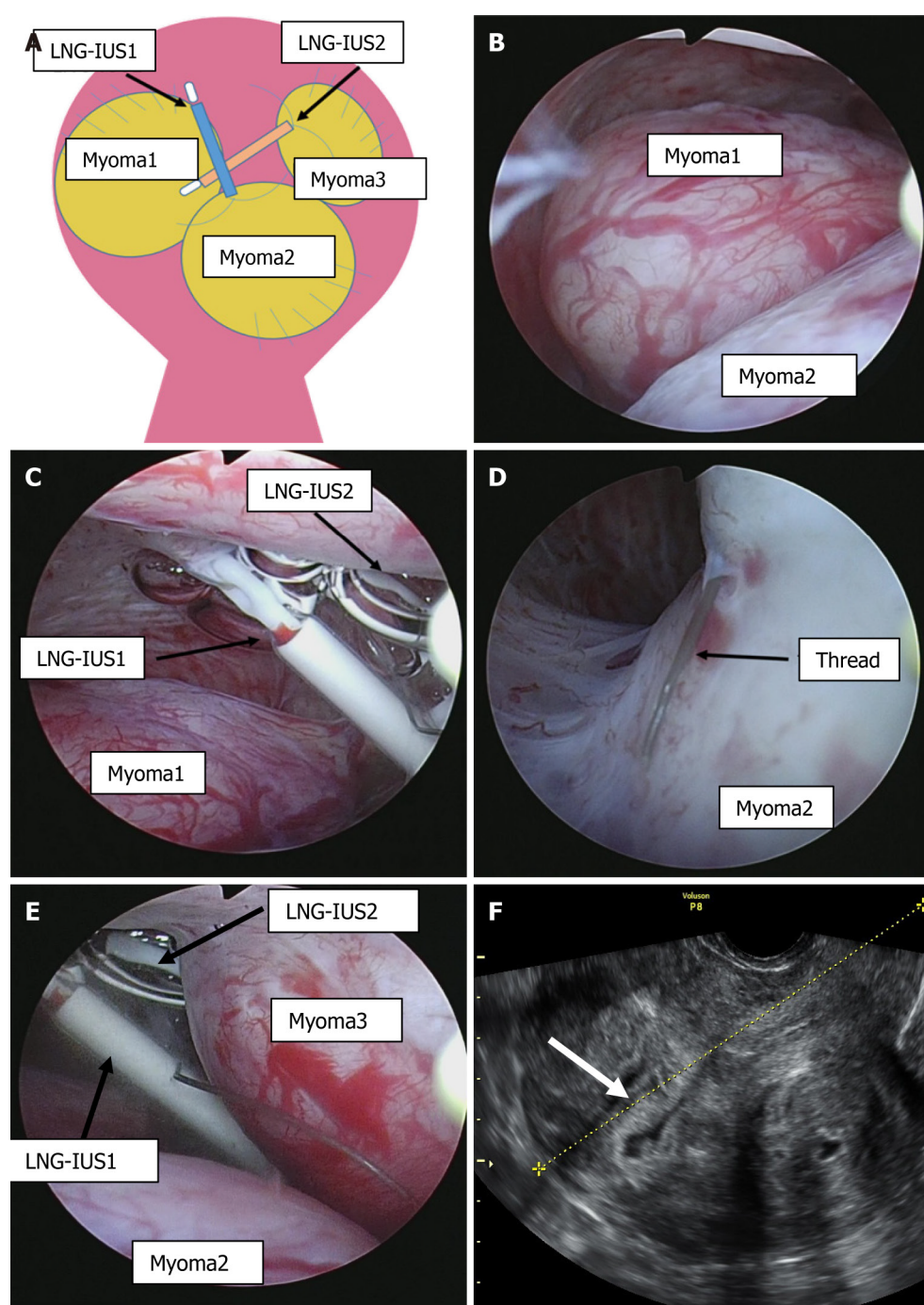
Intrauterine findings at the time of hysteroscopic surgery included an enlarged 4-cm submucosal myoma in the upper right side of the uterine body at a protrusion rate of 70% and an enlarged 4-cm submucosal myoma at a protrusion rate of 90% in the lower part of the uterine body (Figure 2A, B, D and E). In addition, spaces between the uterine myomas and the two LNG-IUS devices and the torn device threads were observed in the fundus of the uterus. The devices had partially perforated the myometrium of the uterine fundus (Figure 2C). The devices were safely removed during surgery using intraoperative biopsy forceps. Then, hysteroscopic myomectomy was performed, and the submucosal myomas were removed. Subsequent hysteroscopy confirmed the absence of bleeding from the perforated section of the myometrium, and the depth was minimal; therefore, a repair operation was not required.

OUTCOME AND FOLLOW-UP

The postoperative course was favourable, and the patient was discharged the day after surgery. Hypermenorrhoea and anaemia showed improvement postoperatively.

DISCUSSION

LNG-IUS complications include menstrual disorders, ovarian cysts, and pelvic inflammatory diseases, including uterine perforation, which is a very rare complication. At the time of perforation, 48% of patients are asymptomatic. Unexpected pregnancy and abdominal pain are often reported. Because symptoms are mild, the time of onset is unknown for many patients. In those with a clear onset, most symptoms manifest soon after insertion[6]. Some risk factors that are known to be associated with uterine perforation include breastfeeding, recent childbirth, and inappropriate insertion techniques[3], none of which were applicable to this patient. When uterine perforation is suspected because no threads can be found, transvaginal ultrasound is nearly always used. X-rays are required in 75% of patients[7]. Computed tomography (CT) and magnetic resonance imaging (MRI) may also be options. In most patients, the diagnosis can easily be made using transvaginal ultrasound or X-ray. CT is the optimal method for assessing complications associated with intra-abdominal IUDs, such as visceral perforation, abscess formation, and intestinal obstruction. MRI is rarely used for such evaluations, although this imaging modality can be performed safely[5]. As a result of searching for LNG-IUS, perforation, and migration, there were 6 similar case reports, including this case (Table 1)[8-12]. At the time of diagnosis, 3 patients were asymptomatic, and 3 patients had lower abdominal pain. Ultrasound was performed in 5 cases, and in 4 cases, the patients were diagnosed with an unclear or incorrect LNG-IUS position. Therefore, it was considered that the position of the LNG-IUS could not be determined only by ultrasound. For complete perforation, due to the potential for adhesions, the World Health Organization recommends that perforating IUDs be removed as soon as possible after the diagnosis is confirmed regardless of their type and location[13]. IUDs implanted in the myometrium can be removed during hysteroscopic surgery[14]. In most cases with perforation, the IUD is removed laparoscopically, and laparotomy is rarely performed[3]. Expulsion of IUDs from the uterus is a relatively common complication, occurring in up to 10% of patients[7]. If an IUD is not confirmed by ultrasound and expulsion is suspected, an abdominal pelvic X-ray should be performed to ensure that the IUD is not in the abdominal cavity. Until confirmation, a new IUD should not be inserted[15]. We evaluated the condition of the endometrium by transvaginal ultrasound three months after surgery (Figure 2F). No defects were found in the endometrium, and it was considered that the injury had no effects. In this



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Figure 2 Hysteroscopic findings in the endometrial cavity and ultrasound findings. A: Illustration of the uterus, fibroids and devices; B: Hysteroscopic findings show multiple fibroids occupying the uterus; C: Levonorgestrel-releasing intrauterine system (LNG-IUS) had perforated the myometrium of the anterior wall of the uterine body; D: A thread had penetrated into the muscle layer; E: LNG-IUS1 and 2 were further toward the bottom of the uterus than myoma 2 and 3; F: The endometrium was smooth on transvaginal ultrasound (white arrow).

case, the patient did not wish to become pregnant in the future and did not wish to have a second-look hysteroscope. A second look is recommended within a few months after surgery, especially for patients who wish to become pregnant[16]. The LNG-IUS is a 32-mm T-shaped structure that fits well into normal-sized uterine cavities. However, the arm may slip out without reaching the cornual wedge in patients with an enlarged uterine fundus. In addition, in patients with uterine malformations or submucosal uterine myomas, the arm may hit the myomas, thereby preventing normal insertion. In particular, in patients with multiple submucosal uterine myomas, such as our patient, the device is considered to be aberrantly positioned between myomas or easily expelled since it is not fixed to the cornual wedge. The length of the uterine cavity increases with exacerbation of uterine myomas and adenomyosis. The thread to remove the LNG-IUS is pulled into the cervix, complicating visualization of the thread during pelvic examination. The same conditions apply to patients with prior gonadotrophin-

Table 1 6 reports on perforation or migration of Levonorgestrel-releasing intrauterine system

Author	Year reported	Age (yr)	Para	Indication	Symptom of perforation	Ultrasound finding for LNG-IUS position	Actual position of LNG-IUS	Risk factor
Our case	2021	46	2	Hypermenorrhea	None	Location cannot be diagnosed due to myomas	In the uterus (partial perforation)	Submucosal myomas
Pappas <i>et al</i> [8]	2009	33	2	Hypermenorrhea	Abdominal pain	Unknown	In the anterior abdominal wall with omentum	After endometrial ablation
Ferson <i>et al</i> [9]	2016	46	1	Contraception	None	In the upper endometrial cavity	The straight arm in the uterus, T shaped arms in the abdominal cavity	Prolonged steroid use
Howard <i>et al</i> [10]	2017	31	2	Contraception	None	In the uterus	In the cul-de-sac	Insertion at 6 wk after vaginal delivery
Saeki <i>et al</i> [11]	2019	29	1	Dysmenorrhea	Abdominal pain	Unknown	In the retroperitoneum	After conization
Makena <i>et al</i> [12]	2021	34	1	Contraception	Abdominal pain	No devices in the uterus	In the left tube	Insertion at 8 wk after vaginal delivery

LNG-IUS: Levonorgestrel-releasing intrauterine system.

releasing hormone agonist treatment. In these patients, the thread was 2 cm-3 cm longer than usual when a cut was required when inserting LNG-IUSs. The development of products with a greater size selection, including new LNG-IUSs, is expected.

CONCLUSION

Plain X-rays are recommended if the thread for removal cannot be detected during the examination of patients with LNG-IUSs. In particular, the indications, insertion techniques, contraindications, and follow-up methods are often poorly understood and executed in countries where LNG-IUSs have only recently been introduced, and thus, caution should be exercised.

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FOOTNOTES

Author contributions: Maebayashi A, Kato K, and Nagaishi M treated the patient; Maebayashi A and Hayashi N diagnosed and wrote the manuscript; Maebayashi A and Kato K contributed to the diagnosis, obtained informed consent, and determined the clinical management of this case; all authors read and approved the final manuscript.

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REFERENCES

- 1 **Kaunitz AM**, Bissonnette F, Monteiro I, Lukkari-Lax E, Muysers C, Jensen JT. Levonorgestrel-releasing intrauterine system or medroxyprogesterone for heavy menstrual bleeding: a randomized controlled trial. *Obstet Gynecol* 2010; **116**: 625-632 [PMID: 20733445 DOI: 10.1097/AOG.0b013e3181ec622b]
- 2 **Lockhat FB**, Emembolu JO, Konje JC. The efficacy, side-effects and continuation rates in women with symptomatic endometriosis undergoing treatment with an intra-uterine administered progestogen (levonorgestrel): a 3 year follow-up. *Hum Reprod* 2005; **20**: 789-793 [PMID: 15608040 DOI: 10.1093/humrep/deh650]
- 3 **Heinemann K**, Reed S, Moehner S, Minh TD. Risk of uterine perforation with levonorgestrel-releasing and copper intrauterine devices in the European Active Surveillance Study on Intrauterine Devices. *Contraception* 2015; **91**: 274-279 [PMID: 25601352 DOI: 10.1016/j.contraception.2015.01.007]
- 4 **Moschos E**, Twickler DM. Does the type of intrauterine device affect conspicuity on 2D and 3D ultrasound? *AJR Am J Roentgenol* 2011; **196**: 1439-1443 [PMID: 21606311 DOI: 10.2214/AJR.10.5483]
- 5 **Boortz HE**, Margolis DJ, Ragavendra N, Patel MK, Kadell BM. Migration of intrauterine devices: radiologic findings and implications for patient care. *Radiographics* 2012; **32**: 335-352 [PMID: 22411936 DOI: 10.1148/rg.322115068]
- 6 **Mosley FR**, Shahi N, Kurer MA. Elective surgical removal of migrated intrauterine contraceptive devices from within the peritoneal cavity: a comparison between open and laparoscopic removal. *JSLs* 2012; **16**: 236-241 [PMID: 23477171 DOI: 10.4293/108680812x13427982377265]
- 7 **Mülayim B**, Mülayim S, Celik NY. A lost intrauterine device. Guess where we found it and how it happened? *Eur J Contracept Reprod Health Care* 2006; **11**: 47-49 [PMID: 16546816 DOI: 10.1080/13625180500456791]
- 8 **Pappas A**, Shambhu S, Phillips K, Guthrie K. A levonorgestrel-releasing intrauterine system embedded in the omentum in a woman with abdominal pain: a case report. *J Med Case Rep* 2009; **3**: 9301 [PMID: 20062790 DOI: 10.1186/1752-1947-3-9301]
- 9 **Ferguson CA**, Costescu D, Jamieson MA, Jong L. Transmural migration and perforation of a levonorgestrel intrauterine system: a case report and review of the literature. *Contraception* 2016; **93**: 81-86 [PMID: 26386445 DOI: 10.1016/j.contraception.2015.08.019]
- 10 **Howard DL**, Beasley LM. Pregnant with a perforated levonorgestrel intrauterine system and visible threads at the cervical os. *BMJ Case Rep* 2017; **2017** [PMID: 28536231 DOI: 10.1136/bcr-2017-220071]
- 11 **Shinichiro S**, Wakimoto Y, Kamei H, Fukui A, Shibahara H. Removal of a Retroperitoneal Foreign Body by Laparoscopic Surgery. *Gynecol Minim Invasive Ther* 2019; **8**: 86-88 [PMID: 31143631 DOI: 10.4103/GMIT.GMIT_84_18]
- 12 **Makena D**, Gichere I, Warfa K. Levonorgestrel intrauterine system embedded within tubal ectopic pregnancy: a case report. *J Med Case Rep* 2021; **15**: 107 [PMID: 33685513 DOI: 10.1186/s13256-021-02723-7]
- 13 Mechanism of action, safety and efficacy of intrauterine devices. Report of a WHO Scientific Group. *World Health Organ Tech Rep Ser* 1987; **753**: 1-91 [PMID: 3118580]
- 14 **Soydine HE**, Evsen MS, Çaça F, Sak ME, Taner MZ, Sak S. Translocated intrauterine contraceptive device: experiences of two medical centers with risk factors and the need for surgical treatment. *J Reprod Med* 2013; **58**: 234-240 [PMID: 23763009]
- 15 **Zakin D**, Stern WZ, Rosenblatt R. Complete and partial uterine perforation and embedding following insertion of intrauterine devices. II. Diagnostic methods, prevention, and management. *Obstet Gynecol Surv* 1981; **36**: 401-417 [PMID: 6455610 DOI: 10.1097/00006254-198108000-00001]
- 16 **Sebbag L**, Even M, Fay S, Naoura I, Revaux A, Carbonnel M, Pirtea P, de Ziegler D, Ayoubi JM. Early Second-Look Hysteroscopy: Prevention and Treatment of Intrauterine Post-surgical Adhesions. *Front Surg* 2019; **6**: 50 [PMID: 31475154 DOI: 10.3389/fsurg.2019.00050]



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