Unusual association of diseases/symptoms

Chronic kidney disease after vesico-vaginal stone formation around a migrated intrauterine device

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Summary

Although the intrauterine device (IUD) seems a reliable and relatively safe method of contraception, it may cause serious complications. A rare complication is uterus perforation. Intravesical migration and secondary calculus formation is exceptionally uncommon. The authors report on a 75-year-old woman in whom a 'forgotten' migrated IUD resulted in vesico-vaginal fistula formation and chronic kidney disease, 39 years after insertion.

BACKGROUND

Intrauterine contraception is an effective and reversible method of long-term birth control, which is used by an estimated 160 million women worldwide.¹ Although the popular intrauterine contraceptive is relatively safe, it can be a source of uncommon pelvic pathology.²⁻⁴ A severe complication of the intrauterine device (IUD) is uterine perforation, which may occur both complete and partial. Ultimately migration of the device through the uterine wall to adjacent organs may occur, including peritoneum, omentum, ovaries, broad ligament, recto-sigmoid and appendix.⁵⁻⁶ In case of intravesical migration, the foreign body may cause calcium precipitation and may serve as a focus of crystallisation, leading to stone formation.⁷

The present extraordinary case reports on a rare but severe complication of an IUD; a 'forgotten' IUD migrated and eroded into the urinary bladder, resulting in impressive calculus formation and creating a vesico-vaginal fistula causing urinary incontinence and recurrent urinary tract infections, contributing to terminal kidney failure.

CASE PRESENTATION

A 74-year-old woman, gravida 3, para 3, was referred to the emergency department at our hospital because of progressive weakness, dyspnoea and abdominal discomfort.

Previous medical history revealed recurrent urinary tract infections, treated with antibiotic therapy. Furthermore she was treated for hypertension by β -blocker therapy (Metoprolol) and cardiac glycoside (Lanoxin). For years, she had been using incontinence pads because of urinary incontinence. For the past 7 years she progressively developed chronic kidney disease (serum creatinine: 193 μ mol/l).

She withdrew from medical follow-up when she moved to a nursing home after suffering from a cerebrovascular accident in 2005.

Physical examination revealed no abnormalities besides an unusual vaginal examination; a hard object was palpated. At further inspection, a white-yellowish 'vaginal stone' was observed.

INVESTIGATIONS

A plain x-ray of the pelvis exposed a large ovoid calcification measuring 71×89 mm within the true pelvis with an elongated curved object centrally (figure 1). Laboratory investigations demonstrated an acute kidney failure (serum creatinine: 857 μ mol/l, urea: 58.3 mmol/l) and a significant metabolic acidosis (pH: 6.95, pCO₂: 2.4 kPa, base excess: 28.0 mmol/l).

Haemodynamics were stable (mean arterial pressure of 103 mm Hg and a regular pulse of 66 beats per minute).

Haemodialysis was started.

Flexible cystoscopy revealed a bladder full of debris and a large calculus penetrating the posterior bladder wall just above the trigone. Ultrasound examination showed bilateral slender calyceal systems and small kidneys (longitudinal size of 8 cm) with a thin homogenous cortex (1 cm).

Urine culture demonstrated an *Escherichia coli* infection.

Vaginal discharge of methylene blue was observed after transurethral administration, demonstrating a vesico-vaginal fistula and explaining her urinary incontinence.

TREATMENT

After gynaecological-urologic consultation, a vaginal lithotomy followed. Multiple fragments were extracted manually using a grasper. The central object seemed an old IUD: a 'Lippes loop'.

The intravesical stone fragment seemed to be fixated in the bladder wall and could not be removed (figure 2).

Stone analysis revealed that the stone fragments were composed of 100% magnesium ammonium phosphate (struvite), which is mainly associated with urinary tract infections.

OUTCOME AND FOLLOW-UP

After initial treatment, the patient rejected secondary cystolithotomy and fistula repair and was discharged to her nursing home 12 days postoperatively. Haemodialysis will be continued on a regular basis because of end-stage kidney disease.

Figure 1 Plain pelvic x-ray revealing a massive calculus around a foreign body (Lippes loop).

Figure 2 Post operative abdominal sagittal T2-weighted MRI image, demonstrating a vesico-vaginal fistula and a (residual) vesical calculus, harbouring a fragment of the intrauterine device.

DISCUSSION

Widely accepted and used by an estimated 160 million women worldwide, the IUD is the most popular and most cost-effective non-permanent but long-acting method of contraception. When used properly, intrauterine contraception is a highly effective and reliable reversible method of fertility regulation.^{1 2}

Although the contraceptive device burdens a low complication rate, it may cause serious early and late complications. Users are at risk of septic abortion, ectopic pregnancy and pelvic inflammatory disease, even in case of antibiotic prophylaxis at time of insertion.^{3 4}

An uncommon, but severe complication of the IUD is uterus perforation; either partial, in which the device may be embedded in the uterine wall and mostly not diagnosed at time of insertion, or complete, perforating the myometrium and serosa.⁶ In a reviewed cohort of 16, 159 IUD users, a perforation incidence of 1.6 per 1000 insertions was reported, both partial and complete.³

In case of complete perforation of the uterine wall, the device might migrate to the peritoneal cavity and can ultimately intrude neighbouring viscera. In 53 of the 356 reviewed cases of uterine perforation by Zakin *et al*,⁶ migration to adjacent organs has been reported, predominantly gastro-intestinal migration (41 cases) and perforation of the urinary bladder (6 cases). Kassab *et al*⁵ reviewed 165 cases of migration beyond the peritoneal cavity, including the omentum (45 cases), rectosigmoid (44), peritoneum (41), appendix (8), small bowel (2), adnexa and iliac vein (1). In 23 cases the bladder was involved.

Unlike in other organs, urinary bladder perforation may initiate stone formation, since an intravesical foreign body may cause calcium precipitation and may serve as a focus of crystallisation. Partial or total IUD-encrustation is reported in 18 of the 41 cases of urinary bladder perforation reviewed by Özçelik *et al*.⁷

Apart from calculus formation, irritative voiding symptoms, recurrent urinary tract infections, suprapubic abdominal pain and haematuria may be present in case of bladder involvement.^{9 10}

Also (hydro) ureteronephrosis and pyelonephritis have been reported.¹¹ In our case, urinary infection impaired renal function severely, contributing to the end-stage kidney disease.

Perforation incidence seems related to the experience of the inserting (para)medical personnel, the size and uterus configuration (anteversion or retroversion), uterus anomalies and cervical anatomy.^{10 12} Some authors advocate that IUD insertion during the puerperium and in lactating may facilitate perforation, probably due to involution of the uterus, (small sized and thin walled) and because of strong uterus contractions (secondary to oxytocin and prolactin production).¹¹ Postpartum low oestrogen levels make the uterus more fragile and vulnerable for perforation. Another possible risk factor is a reduced pain sensation during breastfeeding due to increased levels of β -endorphins, so uterine perforation may remain unnoticed.⁹

In the present case, a 'Lippes loop', the first small polyethylene IUD with a monofilament tail, was retrieved. While in most cases the perforation is diagnosed within 1 year after insertion, in our case, the device was recovered 39 years after insertion, to our knowledge the longest period

reported.⁹ Ever since the Lippes Loop, a wide variety of IUD models has been found in adjacent organs, mostly copper containing.¹³ Even the modern hormone-releasing IUDs have been extracted from the urinary bladder.¹⁴

In case of a missing IUD, cystoscopic examination should exclude bladder involvement. Gruber *et al*¹⁵ presented an algorithm in the management of a missing IUD before localization of the device by cystoscopy. They propagate the less invasive simple pelvic x-ray or ultrasonography to confirm the IUDs location, or secondary hysterosalpingography to clarify the relation between the uterus and IUDs location.

Missing IUDs may be assumed to be expelled, for example during regular follow-up, when at vaginal examination the tail or strings of an IUD are missing, or when a woman gets pregnant. Careful examination to verify IUD expulsion is advised in such cases. An illustrating example is the report of a woman in whom even two missing extra-uterine IUDs were detected.¹⁵

Removal of dislocated IUDs is recommended by the World Health Organization, because of the formation of adhesions, medicolegal and psychological indications.¹⁶ Laparoscopic retrieval in case of intraperitoneal localisation is a minimal invasive option. Transurethral retrieval and eventually stone removal is ideal in intravesical located devices. In case of significant stone load, an open procedure may be more favourable. Other defects, like vesico-vaginal fistulas could also be managed during this procedure.

Learning points

- ▶ The IUD is considered a safe method of contraception but can be a source of severe pelvic pathology, such as migration to adjacent organs.
- ▶ The present case clearly demonstrates the importance of follow-up and early diagnostic procedures in case of a missing IUD.
- ▶ To exclude urinary bladder involvement, simple pelvic radiographic examination and cystoscopy are recommended in case of unexplained lower urinary tract symptoms.

Competing interests None.

Patient consent Obtained.

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