Unusual complication of an intrauterine device

J Kimberly Haladyn, Harvey Ward

CASE

A woman, aged 44 years, presented for routine Mirena® (Bayer, Pymble, NSW, Australia) exchange. The Mirena®, an intrauterine device, had been inserted for menstrual management because the patient could not manage her heavy menstrual bleeding. Past medical history included relapsing–remitting multiple sclerosis (MS) with MS-related paraparesis and neurogenic bladder dysfunction resulting in persistent urinary incontinence. The patient's Expanded Disability Status Scale (EDSS) score, used to quantify the severity of her disability due to MS, was 8.5, meaning the patient is essentially restricted to bed much of day, has some effective use of arms and retains some self-care functions.[1]

Speculum examination revealed the presence of urine in the vagina and, once this was emptied, two large brown masses were seen filling the vagina, which prevented visualisation of the cervix. On an attempt to move the masses, they were easily extracted with no discomfort to the patient. On inspection of the two solid, 3 cm × 2 cm masses, it was noted that they were attached to the Mirena® strings (Figure 1). Post-removal examination of the vaginal canal and cervix were unremarkable.

QUESTION 1

What are the solid masses?

QUESTION 2

How were they formed?

QUESTION 3

What further investigations are warranted?

QUESTION 4

What is the treatment?

QUESTION 5

What is the follow-up?

ANSWER 1

These solid masses are vaginal stones. Vaginal stones are calculi that form in the vagina, also known as colpolithiasis. Vaginal stones are uncommon, but their prevalence appears to be increasing based on the reports in the literature.[2] The true incidence of vaginal stones is unknown.

Vaginal stones are classified as primary or secondary, and both are the result of stagnant urine in the vagina. Primary stones are just a deposition of urinary salts within the vagina and are associated with a malformation. Secondary stones result from the deposition of urinary salts on a foreign body, such as mesh or the strings of an intrauterine device (eg Mirena®). Vaginal stones do not occur in normal vaginal anatomy.

The main risk factors for vaginal stones include prolonged recumbency, elevated body mass index, urinary incontinence, urogenital tract abnormalities (eg fistulae) and foreign body.[3] In the literature, the age of women with vaginal stones ranged from 25 to 68 years, with most women developing vaginal stones between the ages of 40 and 60 years.[3] These women with vaginal stones also had a physical disability, such as MS, meningomyelocele and cerebral palsy, and were bedridden with urinary incontinence.[3] Vaginal stones produce few symptoms[4] and thus should be considered in patients with risk factors and presenting with vaginal discomfort, dysuria, palpation of a foreign body or vaginal bleeding.[5,6] There have also been reports of partner pain during penile–vaginal intercourse as a presenting symptom.[5]

ANSWER 2

The formation of vaginal stones is similar to other urinary tract stones, and most are struvite stones.[3] Struvite stones are composed of urinary salts, ammonium magnesium phosphate ($MgNH_4PO_4 \cdot 6H_2O$). Stones form gradually due to crystallisation of urinary salts triggered by a combination of water reabsorption and urease-producing bacteria.[7] Ammonia, a waste product of urease-producing bacteria, leads to the urine becoming more alkaline, allowing the struvite to precipitate, forming stones.[7] Common urease-producing pathogens causing urinary tract infections include *Proteus*, *Klebsiella*, *Pseudomonas* and *Staphylococcus* species.[7,8] At this stage, the true bacterial culprit in vaginal stones is unclear.

Vaginal stones are more common in some women with physical disabilities that lead to prolonged recumbency because the vaginal outlet is higher than the deep vagina, and urinary pooling occurs. If these women also have decreased vaginal tone and altered vaginal sensation, they might not be aware of the presence of the vaginal stone. Combining this with altered sensation and decreased vaginal tone, this population is less likely to feel the stone or have the ability to expel the stone.

The present case is a case of secondary vaginal stones with numerous risk factors including paraparesis and a neurogenic

bladder. The stones in this patient formed around a foreign body, namely the strings of the Mirena®.

ANSWER 3

Other investigations would include calculi analysis, culture of the stones and urine and a pelvic ultrasound or computed tomography (CT) scan.

Calculus analysis is used to confirm the type and composition of the vaginal stone.

For renal struvite stones, stone cultures are the most likely way to identify the urease-producing bacteria.[9] The second-line approach if the stone cultures are negative is urine culture from the closest source, namely the renal pelvis. If we extrapolate this to vaginal stones, the same premise would apply: stone culture would give the greatest probability of determining an infectious cause, with urine culture of the stagnant urine in the vagina being second best.

A pelvic scan, usually CT, is used to assess for any urogenital anomaly, such as a vesicovaginal fistula.

In this case, both stones were struvite in composition and culture negative for bacterial infection. Urine culture was also negative. The patient decided against any further surgical treatment because it would cause deterioration of her MS. Given this, she declined further imaging because she felt it would not change her management.

ANSWER 4

The main treatment for secondary vaginal stones is to remove the stones along with the precipitating factor, in this case the Mirena®. This was accomplished in the general practice surgery via transvaginal extraction with no complications. A speculum was inserted into the vagina and, using forceps, one stone was gently pulled out with no complications or discomfort. On removal of the first stone, the second stone followed along with the Mirena®; it was at this stage that the stones were found to be attached to the Mirena® strings.

The literature suggests a mix of transvaginal and surgical removals, depending on the size of the stone.[2,3,10]

ANSWER 5

Reviewing the literature, the follow-up process for vaginal stones is lacking.[2,3] A review of the available literature did not identify any guidelines that could be used to guide follow-up for this patient. More research is required in this area.

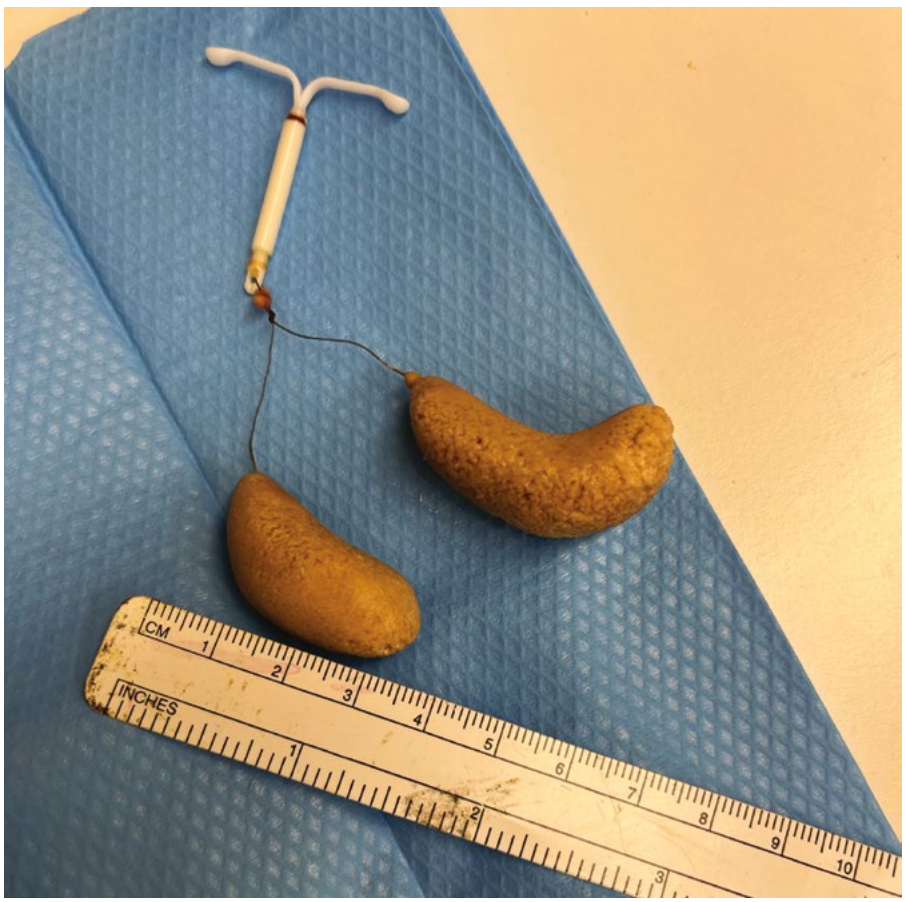

Figure 1. The Mirena® with vaginal stones on both strings.

CASE CONTINUED

The patient was unable to manage her menstruation and requested the Mirena® be reinserted. She was aware of the high likelihood of stone recurrence given her risk factors. Consent was obtained and the Mirena® was inserted. The patient was scheduled for three-monthly checks to monitor for recurrence given her high risk. At the routine check at six months, there was a recurrence of the stones. The Mirena® was removed and, after discussion about the options, the patient decided to trial Depo-Provera (Pfizer, Sydney, NSW, Australia) injections for menstrual management.

Key points

- Vaginal stones are considered rare, but the prevalence of secondary vaginal stones appears to be gradually increasing based on reports in the literature, likely due to the increase in prolapse operations and the use of the Mirena®.
- Vaginal stones induce few non-specific symptoms.
- Speculum examinations should be performed in those with risk factors such as prolonged recumbency, elevated body mass index, urinary incontinence, urogenital tract abnormalities and a foreign body (eg an intrauterine device).

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