



An improperly positioned menstrual cup complicated by hydronephrosis: A case report

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ABSTRACT

Background: Menstrual cups are increasingly used as alternatives to tampons, collecting menstrual fluid with very few side-effects, as previously reported in the literature.

Case: We present the case of a 47-year-old woman with pain in her right flank and an entrapped bladder caused by an incorrectly placed menstrual cup, complicated by acute unilateral hydronephrosis. We describe the computed tomography features that made it possible to make a correct diagnosis. We conducted a literature review in order to be able to list the reported side-effects of the use of menstrual cups.

Conclusion: Given their common use today, it is important that physicians become familiar with menstrual cups and are capable of recognizing cup misplacement to avoid complications such as hydronephrosis.

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1. Introduction

Vaginal or menstrual cups (MCs) are an environmentally friendly and sustainable alternative to tampons and sanitary pads. MCs are inserted into the vagina to collect menstrual fluid. With capacities ranging from 24 to 40 mL, MCs are commonly emptied every 12 h, but women with heavier flows may need to empty the cup more frequently. Very few side-effects have been reported in the English-language literature. Here we report what we believe to be a very rare case of hydronephrosis secondary to the incorrect positioning of an MC.

2. Case Report

A 47-year-old woman (gravida 3, para 3) presented to the emergency department complaining back pain on the right side that had lasted three hours. She had no relevant medical history. Physical examination revealed significant pain in her right flank on percussion. The patient had no fever or other sign of sepsis. Given the lack of gynecological symptoms, the physical examination did not include vaginal examination. She was admitted and underwent imaging and diagnostic tests. The white blood cell count was 2800/mm³, the hemoglobin level 13.8 g/dL, the platelet count 307,000/mm³, the serum creatine level 60 μmol/L, the sodium level 138 mmol/L, the potassium level 4.1 mmol/L, and the C-reactive protein level 0.6 mg/dL. Urinalysis was normal.

As renal colic was suspected, we performed low-dose unenhanced computed tomography (UCT). This revealed entrapment of the left vaginal wall and part of the inferolateral bladder wall; these tissues had become lodged into an improperly positioned vaginal MC (Figs. 1A and 2A), creating right-side hydronephrosis (Fig. 1A and B) and a right-side hydroureter. No urolithiasis was visible.

After UCT, the patient removed her MC and the pain immediately vanished. Pelvic UCT was then repeated; the hydronephrosis and bladder entrapment had resolved (Fig. 2B). Her anatomy was normal. The patient was a long-time MC user. She had not previously encountered any difficulty when inserting an MC. She was discharged; we contacted her several weeks later. She continued to use an MC and had encountered no problems with correct placement. The patient gave her written informed consent for publication.

3. Discussion

MCs inserted into the vagina to collect menstrual fluid are ecologically responsible, comfortable, and cost-effective alternatives to tampons and sanitary pads. MCs are made of silicone or rubber and are well accepted by most women [1,2]. Although initial difficulties may be encountered when inserting the device, insertion becomes easier with practice [1]. Fig. 3A shows appropriate placement of the cup. Usually, incorrect positioning causes leakage [2]. However, Day reported a case with a retained MC; the physician found it difficult to retrieve it [3].

As the terminal portions of the ureters pass forward and medially to attain the fundus of the bladder, they run close to the lateral vaginal fornices, and, as they enter the bladder, they lie slightly in front of the

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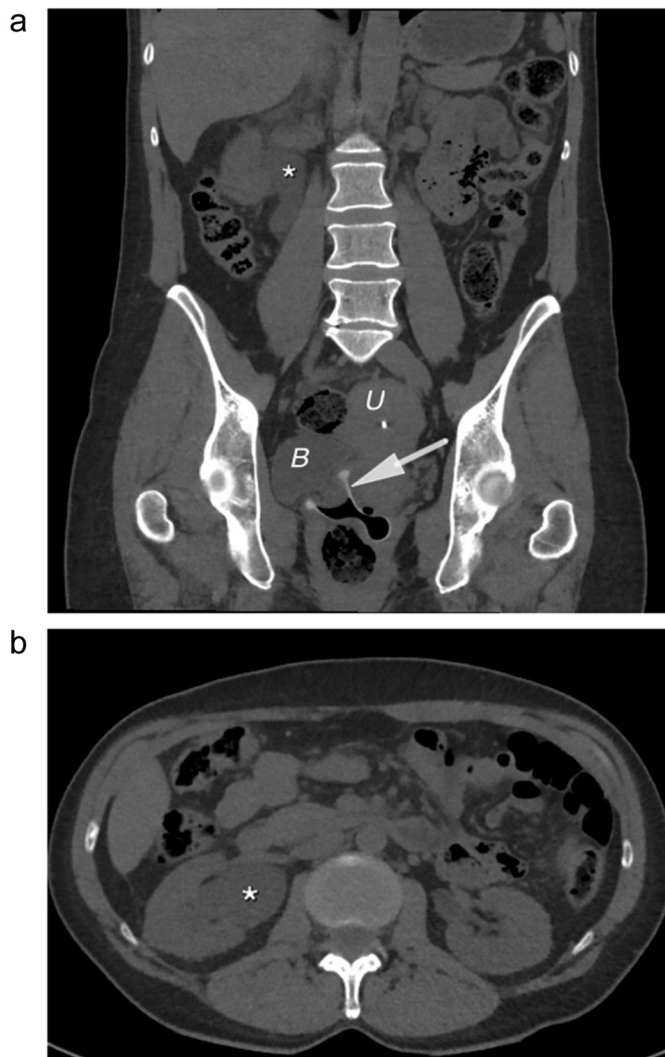


Fig. 1. Low-dose 3-mm unenhanced computed tomography coronal (A) and axial (B) images reveal that the inferior bladder and the right vaginal wall are lodged within an incorrectly placed menstrual cup (arrow). Note the right-side hydronephrosis (*). U, uterus; B, bladder.

anterior fornix [4]. Such anatomical proximity combined with the thinness and plasticity of the vaginal wall caused the bladder of our patient to become entrapped in the MC (Fig. 3B).

UCT is rapid and useful for diagnosing pain in the right flank in non-pregnant women, especially if urolithiasis is suspected. In the present case, UCT revealed the hydronephrosis, allowed exclusion of a urinary calculus and permitted a correct diagnosis; the inferior part of the bladder was trapped in the intravaginal MC. Renal ultrasound (US) is the diagnostic modality of choice in children and pregnant women, revealing upper tract dilatation and facilitating bladder analysis if the bladder is full.

MC removal is the optimal management; if urosepsis is suspected, antibiotic therapy is essential.

We reviewed the literature and found that few complications other than those associated with incorrect MC positioning have been described. As MCs accumulate blood and may trigger retrograde menstruation, they can theoretically increase the risks of endometriosis or adenomyosis [5]. MCs store a medium allowing bacterial growth, thus possibly increasing the risk of infection. To the best of our knowledge, the report by Mitchell et al. is the only confirmed case of toxic shock syndrome associated with use of an MC [6].

This is a very rare case of hydronephrosis secondary to the improper positioning of an MC. Recently, Nunes-Carneiro et al. reported the case

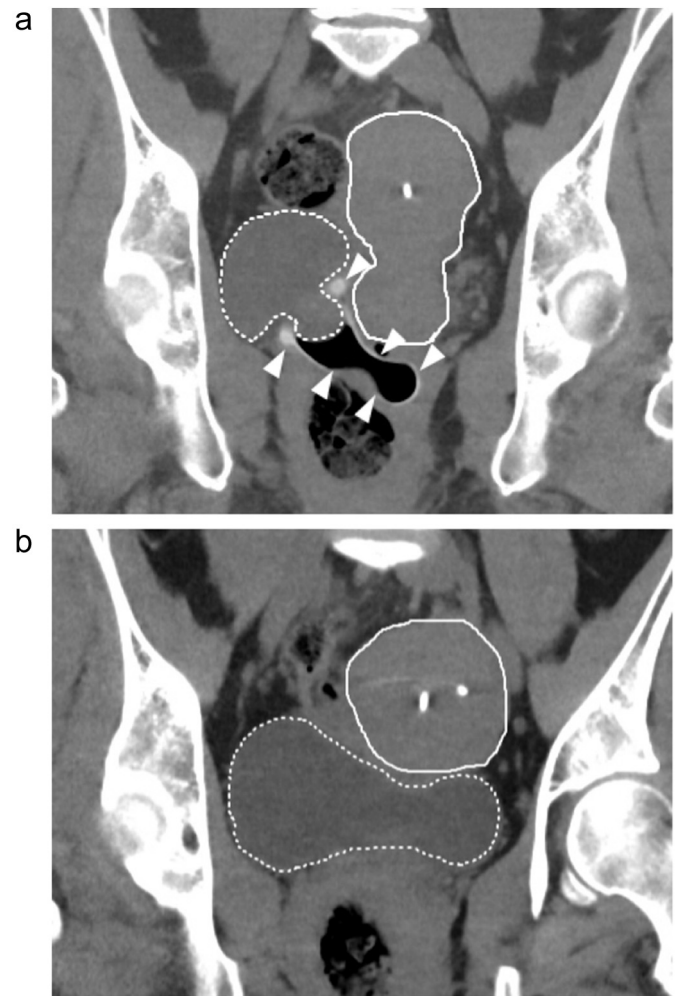


Fig. 2. Pelvic unenhanced computed tomography coronal images taken before (A) and after (B) menstrual cup removal. The arrowheads indicate the cup and the dashed and continuous lines the bladder and uterus, respectively. In B, the entrapment has resolved and the bladder has returned to its normal position.

of a 26-year-old MC user who had right renal hydronephrosis which resolved immediately after removal of the MC [7]. While their observations suggest that the shape and the size of the device were the main cause of hydronephrosis, our experience suggests that incorrect positioning could be another factor in the obstruction of nearby fine structures such as the ureters.

MCs are similar to pessaries and diaphragms, and hydronephrosis secondary to overlong pessary retention has been reported [8–10].

4. Conclusion

Hydronephrosis secondary to bladder entrapment in an MC is a most unusual side-effect. As MC use increases, gynecologists and other physicians must be able to explain the advantages of MCs and inform patients of the very rare side-effects. They must also explain how to insert and remove a MC and must recognize misplacement.

Contributors

Alexandre Stolz contributed to study concept and design, and drafted the paper.

Jean-Yves Meuwly was responsible for critical revision of the manuscript.

Apolline Roussel contributed to study concept and design.

Emilie Nicodème Paulin was responsible for study supervision.

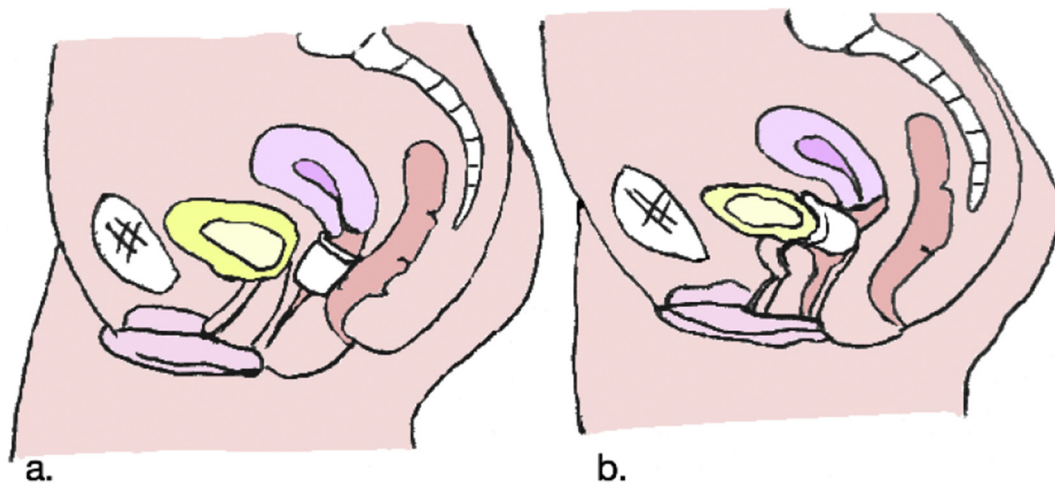


Fig. 3. Appropriate placement of a menstrual cup (A) and the inappropriate placement in our patient (B).

Conflict of Interest

The authors declare that they have no conflict of interest regarding the publication of this case report.

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Patient Consent

Obtained.

Provenance and Peer Review

This case report was peer reviewed.

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