

Perioperative nursing care of a patient with urogenital sinus malformation who underwent vaginal calculus removal and correction: a case report

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Abstract

Cases of urogenital sinus malformation with a huge calculus are complex and rare. Improper nursing care of these cases can lead to a series of problems. We report here a 23-year-old married woman who was admitted to hospital because of primary amenorrhea and failed sexual intercourse for 5 years. Through combined diagnosis and treatment of radiology, ultrasound, urology, gynecology, and other disciplines, the patient was diagnosed with urogenital sinus malformation, a vaginal calculus, and primary amenorrhea. After full preparation, the patient underwent an operation for extraction of the vaginal calculus, urethroplasty, vaginoplasty, and hysteroscopy. The calculus of the patient was removed and the vagina was returned to its normal anatomy. Patients with urogenital sinus malformation and a huge calculus have complex care requirements and experience a particular state of vulnerability during the diagnostic phase. By establishing good communication with patients and providing proper perioperative nursing, physiological and psychological rehabilitation of these patients can be achieved.

Keywords

Urogenital sinus malformation, urine leakage, vaginal calculus, nursing care, primary amenorrhea, sexual intercourse

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Introduction

Urogenital sinus (UGS) is a common structure in embryonic development with common opening of the urethra and reproductive tract. However, UGS normally only exists in a specific embryonic stage and then differentiates into genitourinary and reproductive ducts. If the differentiation process is stagnant, there is persistent UGS malformation, which can manifest as congenital malformation of the urinary system, reproductive system, and even the distal rectum.^{1,2} At present, no cases of UGS malformation with a huge calculus due to poor urine drainage have been reported. In gynecology, most cases of UGS malformation are adolescent hematuria, and these patients cannot have a normal sexual life or they have recurrent urinary system infection after marriage. Surgical treatment of this condition mainly corrects abnormal anatomy to achieve unobstructed urination, an unobstructed vagina and a return to the normal shape of external genitalia.³ Because this condition is complex and rare, it is easily misdiagnosed. If postoperative nursing is insufficient, it may lead to reconstruction of lumen stenosis, urinary incontinence, and constipation. Therefore, perioperative nursing of UGS malformation is as important as its diagnosis. We report here our experience of perioperative nursing of a patient with UGS malformation.

Case report

A 23-year-old married woman was admitted to hospital because of primary amenorrhea and failed sexual intercourse for 5 years. The patient was able to urinate, but not smoothly, and she had leakage of urine for as long as she could remember, especially after running or a long walk. Although the amount of urine leakage was small, a protective pad still needed to be used.

She had undergone laparotomy (her operation record was unavailable and details were unknown) because of lower abdominal pain with poor urination more than 15 years previously. After this operation, her abdominal pain disappeared, but leakage of urine was not relieved. Growth and development of this patient were similar to other normal peers, and her intelligence was normal. She married at the age of 21 years without a history of pregnancy. Her father and husband are healthy, but her mother died in a car accident many years previously. Through information provided by her father, we learned that her mother had not taken any special drugs during pregnancy. The patient was an only child with no similar medical history among her family members.

After a physical examination, we found that bilateral breast development of the patient was normal. The vulvar fissure was short with only one opening in the vestibule. The urethra and vagina opened together in the vaginal vestibule. Additionally, urine was flowing out of the common mouth in forced urination. On a rectoabdominal examination, there was a hard mass of approximately 8 cm in front of the rectum. The activity of the mass was poor, but the boundary was still clear. When the mass was pushed, urine flowed out of the common opening. An 18F latex catheter was inserted into the common opening, which was approximately 14 cm deep, and a small amount of turbid liquid was drained, accompanied by obvious stench. The drainage fluid was found to be urine and a routine urine test showed leukocytes (+++). Her serum squamous cell carcinoma antigen (SCCAg) level was 25.10 µg/L (reference range: <1.50 µg/L). An ultrasonic examination and diagnosis after indwelling catheter indicated urethral-vaginal fistula. The catheter was in the vagina and showed an abnormal echo in the vagina (which might have been

foreign matter). A magnetic resonance examination and pelvic computed tomography examination showed endovaginal dense foreign matter, which was endovaginal effusion.

Using combined diagnosis and treatment of radiology, ultrasound, urology, gynecology, and other disciplines, the patient was diagnosed with UGS malformation, a vaginal calculus, and primary amenorrhea. The nursing diagnosis for our patient was altered urinary elimination, sexual dysfunction, and a risk of perioperative injury. After full preparation, the patient underwent an operation for extraction of the vaginal calculus, urethroplasty, vaginoplasty, and hysteroscopy on 19 March 2019. The hard calculus was oval in shape and was located in the urethra–vagina, approximately 3 cm from the opening of the vestibule, and was approximately 8 cm in diameter with a glazed surface. The calculus was close to the posterior wall of the vagina, but there was no adhesion. The genitourinary tract was almost closed, resulting in an inability to expose the urethral orifice and cervical orifice. Under traction of obstetric forceps, the calculus was successfully removed by using a curved S pull hook. The size of the calculus was approximately $8 \times 7 \times 7$ cm and the weight was 455 g (Figures 1 and 2). After the calculus was removed, we repaired laceration of the rectal mucosa and the posterior vaginal wall. The urethra and vaginal space were



Figure 1. Vaginal calculus of the patient.

separated and lower urethra reconstruction was performed to extend the urethra to 4 cm. Furthermore, the vaginal mucosa was sutured discontinuously and the vagina was prolonged to 8 cm. Hysteroscopy showed that the endometrium was thin and the openings of both fallopian tubes were visible. After vaginal formation, two fingers could be accommodated with no vaginal defecation. One week after the operation, she was discharged with a catheter and her serum SCCAg level had decreased to the normal range.

For successful completion of the operation, we performed adequate perioperative nursing care.

Preoperative nursing

Psychological support. Although the patient had undergone her laparotomy 15 years previously, the problem of urine leakage was not resolved and she had a poor quality of life. We eventually discovered the



Figure 2. Weight of the calculus (g).

psychological and social situation of the patient, and took more initiative to care for her and gained her full trust. Furthermore, we set up a special nursing team to communicate with her husband face to face. In particular, we also communicated with the patient through mobile phone chat software, which is not affected by time and space, and can also protect her personal privacy.

Urethral–vaginal preparation. Long-term poor drainage of urine led to formation of liquid accumulation. To avoid retrograde urinary tract infection after the operation performed in 2019, 1 week before operation, 0.5% povidone iodine solution was used for a vaginal rinse twice daily. We removed the scalp needle from a disposable transfusion device and connected it with flushing fluid. When the patient was in the bladder stone cutting position, we fully lubricated the front end of the transfusion device, opened the regulator to rinse the vulva first, and then gently inserted the rubber tube into the common hole approximately 0.5 cm. We slowly and gently washed the whole wall of the hole. Finally, the blood transfusion device was slowly withdrawn while washing and drying the vulva after full discharge of fluid in the hole. Additionally, this patient was provided oral tinidazole tablets (1 g once a day) for 5 days to prevent retrograde urinary tract infection.

Bowel preparation. To prevent defecation from polluting the visual field of the operation, the patient began to eat a residue-free and semi-fluid/liquid diet 3 days before the operation. One day before the operation, the patient had a liquid diet for lunch and dinner. Food was stopped at midday and drinking water was stopped at 4 am on the day of the operation. Additionally, 1 day before the operation, the patient was treated with compound polyethylene

glycol electrolyte for total gastrointestinal lavage.⁴ The number of defecations caused by total gastrointestinal lavage and cleaning enema was increased and excessive dampness of the skin was prone to mechanical damage.⁵ Therefore, we guided the patient to wipe with soft paper towels to reduce local friction and clean the anus with warm water to reduce local irritation.

Postoperative nursing

Observation and nursing care of infection and body fever. We closely observed the amount, color, odor, and characteristics of vaginal bleeding and exudation. Attention was paid to whether there was gas and defecation in the vagina, and to the occurrence of rectovaginal fistula. Perineal irrigation was prohibited to prevent retrograde infection and was replaced by perineal scrubbing twice a day. After removing perineal sutures on the fourth day after the operation, we encouraged the patient to get out of bed to facilitate drainage of vaginal blood and secretions.

The patient had a fever on the first day after the operation, but her body temperature did not exceed 38°C. Because she underwent rectal repair during the operation, her doctor ordered fasting and careful use of rectal medicine. Therefore, physical cooling was the first choice in the case of body fever. We warmed 0.9% saline ice bags until the ice was semi-melted into frosty water because the ice bags after melting were soft and easy to fix, and increased the heat dissipation area in contact with the forehead.

Management of pain. In the process of pain management, the primary responsibility of nurses was to screen, evaluate, and record the pain of the patient, and report to the doctor for timely treatment as required. We used the visual analogue scale (VAS) to assess the degree of pain and encouraged

the patient to express her feelings. The post-operative VAS score of the patient ranged from 1 to 4, and no severe pain was observed. When the patient was in mild pain (VAS score: 0–3 points), the pain and anxiety were relieved by playing her favorite music with a slow rhythm. When the patient was in moderate pain (VAS score: 4–6 points), we contacted her doctor and provided compound paracetamol tablets for oral analgesia according to the doctor's advice. The analgesic effect was good after the medication.

Intestinal management. In contrast to other patients who gradually change from liquid and semi-liquid to soft food and a normal diet according to recovery of intestinal function, our patient fasted for 1 week and was supplied with total parenteral nutrition. Additionally, diphenoxylate tablets were taken to inhibit intestinal peristalsis because of the operation for rectal repair. We regularly observed vaginal gas, drainage, or defecation of the patient and recorded these occurrences. On the seventh day after the operation, the patient was allowed to drink 50 mL of boiled water that had been cooled to a warm temperature to observe whether there was discomfort. We then gradually increased the patient's food intake. On the eighth day after the operation, the patient discharged soft yellow stool once without obstruction, and there were no abnormal secretions or feces found in vagina. The patient then gradually transitioned to soft food and we ensured that her stool remained lubricated to prevent obstruction.

Prevention of deep venous thrombosis of the lower extremities. The patient was kept in bed for 4 days after lithotomy for 6 hours, and the Caprini score of the patient was 4, which indicated that the risk of venous thromboembolism was moderate. The patient wore graduated compression stockings before

entering the operating room and wore them for 18 hours a day. When the patient was no longer bedridden, we instructed her to exercise properly according to the degree of physical tolerance.

Discharge guidance and follow-up. The patient was discharged with a catheter on the eighth day after the operation. Before discharge, we instructed the patient to wash the perineum twice a day with 5% povidone iodine and wash the perineum after defecation. We demonstrated and taught this procedure to the patient before discharge and gave her printed instructions to ensure that she could do it alone at home. One week after the operation, the patient began to take estradiol valerate tablets (2 mg once a day) orally for 21 days. On the 12th day, dydrogesterone tablets were added (10 mg twice a day). This artificial cycle of sequential therapy can promote endometrial hyperplasia. An artificial medication cycle reminder was set up on the patient's mobile phone to ensure the timeliness and accuracy of the medication. One week after discharge, the patient visited the hospital to remove the catheter. Her urination was controllable, urine output returned to normal, and there was no need to use a urine pad. Two months after the operation, sexual intercourse through the vagina was successful.

Discussion

UGS malformation is a rare form of urogenital anomaly secondary to failure of urethral–vaginal division, resulting in a common vaginal and urethral opening.⁶ The condition of UGS malformation with a huge calculus is complex and rare, and improper care can lead to a series of problems.^{1,2} In our patient, there were two major challenges in the early stage of diagnosis. First, determining the nature of the vaginal mass through various auxiliary examinations was difficult. Second, the

patient was 23 years old, and the sizes of the uterus and ovaries were essentially normal. Additionally, an endocrine examination showed no abnormal results. Therefore, these factors led to the cause of primary amenorrhea being difficult to determine. Through discussion and combined diagnosis and treatment of radiation, ultrasound, urology, gynecology, and other disciplines, we speculated that that urine flowing through the vagina and calcium urate deposited in the vagina for a long time caused formation of the calculus. Additionally, long-term urine reflux to the uterine cavity and deposition of calcium urate in the endometrium led to amenorrhea. The elevated serum SCCAg level suggested that this may have been associated with prolonged chronic stimulation of vaginal squamous epithelium by urine and the calculus. After surgery to relieve urinary obstruction and removal of the calculus, SCCAg levels were decreased to the normal range. We patiently explained the reason for the elevated serum SCCAg level of our patient to relieve her psychological distress and make her better cooperate with our treatment. At present, there is no standard perioperative nursing guide for this complex condition. Therefore, we have summarized the whole process from admission to discharge of this patient in the hope of providing others with a reference in nursing.

Because the patient's condition was unusual, we performed adequate nursing preparations before the operation. The best time for patients with UGS malformation to be operated on is before 3 years old.⁷ Our patient had undergone an operation 15 years before visiting our hospital, but it had not solved the problem of urine leakage and her poor quality of life. The patient failed to have sexual intercourse after marriage and future fertility was unpredictable, which led to her feeling guilty regarding her husband. Therefore, comforting and improving the

patient psychologically for recovery were important. We communicated fully with the patient to relieve her psychological burden and establish confidence in the patient for the operation.^{8,9} Finally, these measures achieved good results. Moreover, the patient's vagina and urethra opened in a cavity and urine entered the vagina, which led to accumulation of urine. After admission, the catheter drainage had a peculiar smell and the white blood cell content in a routine urine test was high, which indicated infection. To avoid retrograde urinary tract infection after the operation, we chose iodophor disinfectant to wash the urethra and vagina of the patient.¹⁰ This disinfectant was chosen because an oxidizing active factor released by iodophor can rapidly kill bacteria, fungi, and viruses¹¹ and its corrosion is weak. Iodophor is an ideal vaginal lavage solution before an operation. Additionally, the vulvar fissure of the patient was short and the superficial fovea of the vestibule was only approximately 1 cm, so that the cervix could not be exposed. Therefore, vaginal irrigation under routine conventional vaginal speculum exposure was not suitable for the patient. We decided to use the rubber tube of a transfusion device. Because this tube has a smooth surface, damage to the hymen and vaginal wall is small. Additionally, there is still room for washing fluid to flow out, which can effectively avoid reflux of contaminated liquid. On the third day after vaginal irrigation, the odor of the catheter drainage was obviously alleviated, which suggested that this measure was effective. Furthermore, an ultrasound examination before the operation suggested that the calculus might be adhered to the posterior wall of the vagina and the risk of injury to the posterior wall of the vagina or rectum was high during extraction of the calculus. High-quality intestinal preparation is the basic prerequisite of vaginoplasty and it is also important

for the success of the operation.¹² Therefore, although preoperative bowel function of our patient was normal, we prepared her diet and an enema before the operation to prevent defecation from polluting the visual field during the operation.

Similar to preoperative nursing, postoperative nursing was important for rehabilitation of our patient. The vagina and urethra of the patient were soaked with urine for a long time before the operation and the posterior wall of the vagina and rectal mucosa were injured during the operation. Additionally, surgical wounds involved the urethra, vagina, and rectum, which could have led to infection. If improperly handled, septicemia easily occurs. Therefore, in nursing, careful observation after the operation is required to determine whether there are complications. Pain is a common postoperative symptom of patients. After the operation, we accurately evaluated the degree of pain in our patient and provided corresponding nursing measures. Consequently, her pain was well relieved. Additionally, in this type of patient, the intestinal mucosa is vulnerable to damage during the operation. We controlled the diet of our patient after the operation to prevent intestinal complications. Deep venous thrombosis is one of the most serious complications after gynecological cystolithotomy.¹³ This condition often leads to lower extremity dysfunction, and severe pulmonary embolism can threaten the life of patients. The Caprini score of our patient was 4 and the risk of venous thromboembolism was moderate. Therefore, the standard prevention plan for this patient was based on basic prevention and physical prevention. Methods included using graduated compression stockings, performing ankle pump exercise under guidance, and receiving massage-passive exercise from her trained relatives. All of these methods are effective and relatively low-cost physical prevention

measures, which can reduce economic pressure while playing a preventive role. Finally, because of the complexity of the patient's condition, discharge guidance and follow-up were necessary after the patient was discharged from hospital. These measures are helpful for patients dealing with problems during postoperative recovery.

Drug interventions for our patient mainly included antibiotics and hormone replacement drugs. Before providing tinidazole to the patient, we first ensured whether she had a corresponding history of drug allergy. We administered this drug only after the possibility of any allergy was eliminated. Major adverse reactions caused by tinidazole are from the gastrointestinal tract. Therefore, we instructed her to take this medicine after meals to relieve gastrointestinal discomfort. For hormone replacement drugs, we focused on informing her about the role of sequential therapy. Furthermore, we instructed her to take her medicine on time and at the correct quantity, and not to stop or miss the medication, which ensured a therapeutic effect.

UGS malformation is a congenital disease involving the urinary and reproductive systems. Patients with UGS malformation often have a sense of inferiority. We did everything possible to protect our patient's privacy. All medical staff followed the ethical principle of not discussing the patient's conditions in the ward or in front of irrelevant personnel, and did not disseminate any private information about the patient. During nursing operations, we covered the patient appropriately to ensure that she achieved the greatest sense of security.

These nursing measures, including intestinal management, prevention of infection, prevention of deep venous thrombosis, and health guidance, not only ensured the success of our patient's operation, but also provided a basis for a smooth recovery after the operation. The risk of

perioperative injury was effectively controlled. Because of the patient's smooth recovery after the operation, her problems of altered urinary elimination and sexual dysfunction were solved. Furthermore, as the patient's body recovered, her psychological burden was reduced and additional psychological problems were avoided.

The patient's perspective on our interventions changed dramatically throughout the whole process. As described above, the patient initially rejected our care and treatment interventions because of her psychological burden. However, our continuous guidance and the effect of treatment not only made her gradually trust us, but also made her more cooperative with our treatment measures during her hospitalization. Eventually, she was satisfied with our overall treatment, which is also the basis for our ideal therapeutic effect.

Because cases of UGS malformation complicated by a huge calculus are rare, information about perioperative nursing of such cases is also limited.^{6,14} To the best of our knowledge, this is the first report of a perioperative nursing experience of UGS malformation complicated by a giant calculus. This report summarizes our nursing experience combined with discussion of the relevant literature, which could be useful for guiding perioperative nursing of this type of patient. We also hope that our findings will be helpful for the rehabilitation of such patients. However, because our nursing intervention was carried out in a single case, some measures may not be applicable to other patients because of individual differences. Therefore, we also hope that more clinicians can share their treatment experience about this condition in this future.

Conclusion

UGS malformation with a giant calculus in the vagina is rare in the clinic. In our

patient, the calculus was removed by an operation while the urethra and vagina were reconstructed to achieve the goal of restoring anatomy and improving function. Because of the difficulty of the operation on the huge calculus, we not only prepared surgical plans in various disciplines before the operation, but also improved preoperative preparation, including psychological care, as well as urethral–vaginal and intestinal preparation. After the operation, the condition of the patient was closely observed. Management to prevent infection was strengthened. Additionally, guidance for discharge and follow-up were well carried out. Through close cooperation of a multi-disciplinary team, especially the medical-nursing team, our patient was successfully treated. Her urine leakage was relieved and normal sexual life was restored. Finally, the quality of life of the patient was greatly improved.

Declaration of conflicting interest

The authors declare that there is no conflict of interest.

Ethics

Written informed consent for publication was obtained from the patient. The consent procedure and study protocol were approved by the Medical Institutional Ethical Committee of Women's Hospital, Zhejiang University School of Medicine.

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