

Case Report

# Perinatal Care for a Patient with Abdominal Cocoon Undergoing in Vitro Fertilization Embryo Transfer and Complicated by Recurrent Urinary Retention: A Case Report

Hui Yang <sup>\*</sup> , Rong Liao 

The Second Xiangya Hospital of Central South University, Changsha, China

## Abstract

**Introduction:** Abdominal cocoon is a rare and complex disease with significant complications. The management of pregnant patients with abdominal cocoon is rarely reported. **Clinical Findings:** A 31-year-old infertile Chinese woman with abdominal cocoon, undergoing in vitro fertilization embryo transfer, was admitted to the hospital twice due to recurrent urinary retention. Prior to this pregnancy, she had undergone four unsuccessful embryo transfers and was diagnosed with abdominal cocoon during laparoscopy for bilateral tubal blockage. **Diagnosis:** Laparoscopy revealed a blockage in both fallopian tubes and severe adhesions in the abdominal-pelvic cavity, confirming the diagnosis of abdominal cocoon. **Interventions:** The treatment team organized a multi-disciplinary consultation with experts during the patient's last hospitalization and developed a nursing care plan. The patient received vigilant monitoring for bladder function, catheter care, and the prevention of urinary tract infections during pregnancy, along with nursing care for postoperative complications. **Outcomes:** The patient was discharged after 9 days. A healthy female neonate was delivered by cesarean section, and both mother and baby recovered well after the operation. Pathological examination revealed peritoneal fibrosis, but no other issues or postpartum complications occurred. **Conclusion:** This case report highlights the nursing care required for a patient with abdominal cocoon undergoing IVF embryo transfer and complicated by recurrent urinary retention. It demonstrates a practical approach to managing a complex and rare disease in pregnant women.

## Keywords

Nursing, Pregnancy, Abdominal Cocoon, Recurrent Urinary Retention

## 1. Introduction

Abdominal cocoon (AC) is a rare condition with a complicated etiology, first reported by Foo et al. in 1978 [1]. In this condition, the small bowel is partially or totally encased by a thick fibrocollagenous membrane, give it a cocoon-like appearance. The absence of omentum is the characteristic feature that gives it its name. The etiology of this disease is

not clear, but most pathogenesis is thought to be related to congenital abnormalities of peritoneal development, foreign body stimulation, chronic peritoneal inflammation caused by infection, etc. It is difficult to diagnose due to its rarity and non-specific clinical manifestations [2, 3]. Women of childbearing age are often diagnosed before pregnancy by

\*Corresponding author: Yanghui554@126.com (Hui Yang)

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laparoscopy due to primary infertility. Female patients may present with infertility, pelvic mass, menstrual irregularity, lower abdominal pain, and other symptoms [4]. Studies [5] have shown that patients with AC have different degrees of genital involvement, with the fallopian tube and ovary wrapped in the fibrous membrane, resulting in adhesion, distortion, and hydrops of the fallopian tube. This limits the activity of the fallopian tube and the function of oocyte retrieval or sperm transfer, leading to infertility [6]. Another study has shown that there are no special discomforts in pregnancy, but urinary retention, acute or chronic intestinal obstruction can occur occasionally in some pregnant women in the third trimester [7]. Urinary retention (UR) refers to the inability to empty the bladder through voluntary urination. The causes of urinary retention are numerous and can be classified as obstructive, infectious and inflammatory, pharmacologic, neurologic, or others. Obstructive causes in women often involve the pelvic organs [8]. Changes in hormone levels during pregnancy lead to decreased ureteral peristalsis and increased bladder capacity, which will result in voiding dysfunction and vesicoureteral reflux [9]. Urinary retention in pregnant women mostly occurs after delivery. Most women can be treated with a short period of catheterization. However, antenatal urinary retention requiring catheterization is uncommon, affecting in 1-in-1000 pregnancies [10]. Urinary retention creates an environment conducive to bacteria growth, significantly increasing the risk of urinary tract infection. Urinary tract infection can lead to detrusor inflammation and bladder edema, impairing bladder function and exacerbating urinary retention. Women are more susceptible to urinary tract infections than men [11], partly due to the shorter and straighter female urethra. Pregnant women are particularly vulnerable to urinary tract infections due to hormonal changes during pregnancy [12]. Urinary tract infection during pregnancy poses risks to both mother and baby, with morbidity rates ranging from 5.0% to 10.0% [13]. While the incidence of urinary tract infection in pregnant women is high, the incidence of urinary retention and urinary tract infection in pregnant women with AC has not been reported, likely due to the rarity of AC. As pregnancy progresses and the uterus enlarges, the frequency and severity of UR and UTIs in AC patients may increase, with symptoms becoming more pronounced. The adhesions of abdominal organs complicate natural delivery and create a complex abdominal environment in cesarean sections, making the choice of delivery mode challenging. Addressing the worsening symptoms of urinary retention in the third trimester of pregnancy, how to help AC with pregnant women relieve symptoms, prevent complications, and achieve a safe delivery becomes an urgent problem to be solved, and the care of AC also faces complex challenges. Recently, a rare case of AC was admitted to our hospital, and the patient was delivered safely through Multi-disciplinary team (MDT) team cooperation. We report on the care of this case as follows to summarize and discuss.

## 2. Case Report

### 2.1. Patient Information

The woman provided informed consent for this case report, and institutional review board approvals were obtained from the hospital. The patient is a 31-year-old married woman who attended the hospital due to menopause lasting more than four months. She reported experiencing frequent and urgent urination for half a month and kidney stones for 2 days.

The patient presented to the emergency department with urinary pain and an inability to urinate for 10 hours, and was subsequently given a catheterization. After the catheter was removed, she reported smooth urination and no pain, but continued to experience urgency and frequency. She was then admitted to the hospital for treatment of urinary calculi and infection, complicated by pregnancy at 16 weeks' gestation, in vitro fertilization and embryo transfer (IVF-ET), and antiphospholipid syndrome.

Upon reviewing her medical history, there were no previous symptoms of abdominal pain, and she had no history of liver disease, tuberculosis, intraperitoneal administration, long-term use of beta blockers, or surgery. The patient had undergone four unsuccessful embryo transfers, including one unsuccessful implantation and three aborted embryos. In 2018, she underwent bilateral tubal dredging due to "bilateral fallopian tube blockage", and severe adhesions were found during a subsequent laparoscopy for bilateral tubal occlusion in 2019. She was diagnosed with abdominal cocoon disease and antiphospholipid syndrome, and was treated with ethylprednisolone, hydroxychloroquine, and aspirin after the operation. With half a year of treatment, the patient's condition improved and regular reviews of her antiphospholipid antibody showed normal results. On November 26, 2020, she underwent IVF-ET in our hospital, during which two frozen blastocysts were transplanted. She experienced nausea and vomiting during early pregnancy, and was treated in the hospital with progesterone and phloglucinol for 11 days due to abnormal vaginal bleeding and abdominal pain at 9 weeks' gestation. A B-ultrasound showed uterine hemoperitoneum, and colpomyces and multiple stones were detected in both kidneys. Apart from these findings, her lab tests were normal.

### 2.2. Clinical Findings and Outcomes

Before giving birth, she was hospitalized four times. The first hospitalization was on March 17, 2021. She was treated with magnesium sulfate, heparin, and progesterone for one day due to an increased cord blood flow resistance (S/D 6.35). During her first hospitalization, she experienced dysuria, vomiting, and percussion pain in the right renal area. After being catheterized, she was able to relieve urine by herself. The second hospitalization was on April 13, 2021, when she was 19 weeks and 5 days pregnant. She sought medical advice due to repeated symptoms of frequent and urgent urination

and not being able to urinate for 9 hours. B-ultrasound showed an increased umbilical cord blood flow resistance, with the umbilical artery resistance increasing to 5.48 and the middle cerebral artery resistance increasing to 6.33 repeatedly. She remained catheterized for several days while in the hospital.

On May 20, 2021, a B-ultrasound showed that the umbilical cord blood flow resistance had increased (S/D 6.34). There were positive results in the thrombus elasticity diagram, indicating hyperactive coagulation factor and platelet aggregation function, positive for anti-histone antibody, and a higher anti-A/B titer ratio as well. The treatment options included hydroxychloroquine twice a day to modulate immunity, betamethasone 12mg intramuscularly injected one day to promote fetal lung maturation, magnesium sulfate and amino acids to improve placental circulation, methylprednisolone and aspirin to prevent blood clots, and more.

On August 19, 2021, the patient requested hospitalization for delivery. After a detailed physical examination, the assessment of pelvic and fetus was normal, and the BISHOP score was five. There were no contraindications for vaginal delivery, and the doctor suggested she deliver vaginally. On August 20, a uterine balloon was given to promote cervical maturity and induce labor. Sterile normal saline was injected into the uterine and vaginal water sacs (80ml and 20ml, respectively), and the end of the uterine balloon was fixed on the inner thigh with sterile gauze. After the operation, the location of the fundus in the abdomen was marked, and the operation was smooth, with no discomfort for the patient.

The doctor removed the uterine balloon on August 21, and immediately afterward, 25ug of misoprostol was placed in the vagina. Intravenous infusion of phloroglucinol was used to promote cervical maturation, and the patient gradually developed irregular contractions and small amounts of vaginal bleeding. After receiving oxytocin on August 22, the patient had regular contractions, and as soon as labor started, intrathecal anesthesia was administered for analgesia. Eighteen hours after labor started, a vaginal examination revealed that the uterine orifice was 3cm wide, there was cervical edema, and the fetus station of the presentation part was 2cm above the ischial spine. The doctor injected lidocaine and atropine into the cervix, but the elimination of edema was not effective. A cesarean section with epidural anesthesia was performed at 11:00 due to primary uterine systolic fatigue and a prolonged incubation period.

Due to the peritoneum closely adhering to the bottom of the uterus, it was not possible to enter the abdominal cavity; hence an extraperitoneal cesarean section was performed. During the operation, it was found that approximately two-thirds of the anterior uterine wall was adhered to the bladder, which was suspended near the umbilical level. After a difficult separation of the bladder from the anterior uterine wall, there were multiple bleeding points at the separation site. The operator administered carbetocin and Carprostamine triol to prevent postpartum hemorrhage. The total surgical blood loss was approximately 500ml. On August 24th, a healthy

female neonate was born weighing 3,400g with Apgar scores of 7 and 9 at 1 and 5 minutes, respectively. Both the mother and baby recovered well after the operation. Pathological examination revealed peritoneal fibrosis, but no other issues or postpartum complications occurred. The patient stayed in the hospital for 4 days and she and her newborn were discharged from hospital 96 hours after cesarean section. Follow-up medical services at 42 days, 3 months, and 6 months postpartum showed a good prognosis and normal laboratory results.

### 3. Nursing and Discussing

#### 3.1. Nursing Care Plans of Multi-disciplinary Team

This case is extremely rare, as the patient is pregnant with AC and extensive adhesion of pelvic and abdominal fibroma to organs in the pelvic area. The treatment team organized a multi-disciplinary consultation with experts from urology, vascular surgery, obstetrics and gynecology, and psychiatry. Based on the patient's condition, the experts discussed and reached a consensus on the following treatment plan:

1. As the gestational age increases and the fetus grows, the physiological and anatomical structure of the bladder changes, leading to prenatal acute urinary retention [14]. In the early stages of urinary retention, the best treatment is catheterization. The experts recommended continuous indwelling catheterization for bladder function training. They selected a reusable, uncoated catheter with a lumen of 12 mm to avoid urethral mucosal congestion, edema, and dysuria.
2. Relaxation training can help patients relax their sympathetic nerves and promote the relaxation of the urethral sphincter, which is conducive to spontaneous urination. Hospitals should, as far as possible, provide a quiet and private environment for patients to urinate. The head of the bed should be raised by 30-45° in a semi-sitting position when the patient lies down to relieve nervousness and improve dysuria. If the patient experiences difficulty urinating, listening to the sound of running water and covering the bladder area with a warm, damp towel may help induce urination.
3. Bladder training should be performed to enhance the nervous system control of urination, reduce the sensitivity of urination, and enable the patient to urinate spontaneously. Bladder training involves drinking more water during the day and avoiding water at night, delaying urination as much as possible, and gradually increasing each urination volume to be greater than 300ml. In order to break the vicious cycle of mental factors, patients can take an appropriate amount of sedative and sleeping drugs to help them sleep. Re-learning and mastering the skills of urination control are efficient for

reducing the sensitivity of the bladder. A voiding diary should also be kept during treatment.

4. Urination awareness training should also be performed. Five minutes before spontaneous urination or catheterization, patients should be instructed to relax their bodies, imagine lying in a quiet, spacious bathroom, listening to running water, and trying to urinate.

### 3.2. Evaluating and Monitoring Bladder Function

Urinary retention can cause patients to experience pain in the suprapubic bladder region and an inability to urinate spontaneously, severely affecting their daily lives. To assess these symptoms, a primary nurse used the Female Urination Behavior Belief Behavior Scale to evaluate the perception of susceptibility and severity of lower urinary tract symptoms, the benefits of healthy urination behavior, healthy urination behavior disorder, and self-efficacy [15]. The scale used a 1-5 rating method, with higher scores indicating higher perception levels in each dimension. The Cronbach's alpha coefficients were 0.77, 0.91, 0.82, 0.75, and 0.60, respectively.

The patient's scores indicated that her urination behavior tended to be unhealthy, she perceived significant obstacles to urination, and her belief in healthy urination behavior was weak. Observations of urination focused on evaluating the function of the bladder sphincter and urethral detrusor daily. The patient was trained to lift the sacrococcygeal region off the bed for 6 to 8 seconds, 2 to 3 times a day, using both upper and lower limbs. The nurse also asked about the patient's lower urinary tract symptoms and bladder sensation during urination and checked her urine routine during hospitalization. Urinary ultrasound and urodynamic examinations were performed on admission and before discharge.

The nurse investigated the patient's urination position and interval and encouraged her to urinate in a timely manner. Individualized urination nursing was implemented based on the patient's symptoms at different stages of pregnancy. In the third trimester, when the patient could not squat or sit to urinate, the nurse assisted her in urinating in the supine position on the bed. This approach effectively reduced the occurrence of urinary retention.

### 3.3. Choosing the Appropriate Time for Delivery

Abdominal cocoon is a condition in which surgical entry into the abdomen is difficult and carries a high risk of postoperative abdominal adhesions. Surgery can easily stimulate and damage the intestine, resulting in postoperative intestinal obstruction [16]. Vaginal delivery is the best option for this condition. During the waiting period for delivery, the midwife monitored the fetal heart electronically twice a day, monitored the vital signs at 2-hour intervals, and observed the uterine contractions and fetal heart rate for 15-30 minutes. Vaginal

examination was conducted every 2 hours during the incubation period to determine the decline of fetal presentation and cervical dilation, and any issues during the delivery process were proactively managed. After a full trial of labor, the patient ultimately underwent cesarean section to terminate the pregnancy due to primary uterine atonia and prolonged latency. Given the surgical difficulty of AC, the treatment team contacted a multidisciplinary team consisting of urology, anesthesiology, neonatology, and digestive surgery to assist in the operation. Preoperative preparations, including skin preparation, catheterization, blood transfusion, electrocardiogram, and other related procedures, were conducted to exclude contraindications to surgery and anesthesia. During the operation, the nurses worked with the doctors to position the patient effectively, establish two effective venous channels for the patient, and prepare an emergency plan for intraoperative massive hemorrhage. Immediately after delivery, 10IU of oxytocin was administered intramuscularly to the uterus, followed by a 0.1mg intravenous injection of carbetocin, and abdominal pressure was applied to prevent postpartum hemorrhage. During the operation, the nurses remained focused on the patient's vital signs and maintained effective communication with her to provide comfort and alleviate anxiety.

### 3.4. Preventing Postoperative Complications

Surgery in patients with AC can irritate the peritoneum and cause uterine inertia, which can worsen if pelvic organs adhere. Care interventions include: (1) Continuous electrocardiogram monitoring was performed to monitor the patient's vital signs after surgery, and the postpartum hemorrhage rescue box and rescue vehicle were prepared by the bedside. After the operation, oxytocin was used to prevent postpartum hemorrhage, and cefoxitin sodium was used to prevent infection. (2) Six hours after the operation, nurse evaluated the height and contractility of the patient's uterine fundus every hour, massaged the uterus through the abdomen, weighed the blood-soaked puerperal mattress to estimate the amount of vaginal bleeding, observed the patient's facial color and whether there was bleeding from the incision site, and paid attention to the patient's complaints and needs. (3) Patients with AC have a high incidence of early postoperative small bowel obstruction (EPSBO) [17] and intestinal adhesion. Early mobilization is an effective measure to prevent and treat these complications. According to the core symptoms of the gastrointestinal quality of life index (GIQLI) [18], the nurse should observe whether the patient has abdominal pain, bloating, nausea, vomiting, and other discomfort and assess the frequency of bowel movements and the recovery of intestinal motility to determine the presence of intestinal obstruction symptoms. The patient did not experience any discomfort, such as abdominal distension or pain, after the operation. She was able to pass flatus through her anus on the second day after the operation and had a normal bowel movement on the third day. (4) Within 6 hours after surgery,



the nurse elevated the head of the bed 45 °, assisted the patient in taking the semi-sitting position, and helped the patient turn over in bed every 2 hours. The nurse also performed lower limb massages and leg-ankle pump exercises to prevent venous thrombosis. The patient was urged to engage in more activities to prevent postoperative abdominal organ adhesion. As long as the patient's physical strength permits, the "four steps" activity method should be implemented, which involves moving from lying in bed to sitting on the edge of the bed, then standing on the edge of the bed, and gradually transitioning to independent walking [19]. (5) It is important to cultivate a healthy diet and lifestyle for patients with AC, as overeating can reduce intestinal motility. Postoperative dietary procedures for surgical patients include a fluid diet for 6 hours after surgery, followed by an advanced semi-fluid diet after anal exhaust, and an ordinary diet can be taken if there are no intestinal discomfort symptoms. The diet should be gradually introduced to ensure the patient's postoperative nutritional requirements are met. Regularly checking blood routine, liver and kidney function, and other biochemical tests can provide guarantees for the body's electrolyte and acid-base balance.

### 3.5. Care of Catheter

An indwelling catheter is the most effective way to relieve urinary retention, but it also increases the risk of infection. To prevent urinary tract infections, the following care measures should be taken: (1) Strictly perform aseptic procedures during catheterization due to the recurrent symptoms of urinary retention in the prenatal period. Properly fix the catheter on the patient's thigh with a catheter logo, and fix the urine collection bag on the side of the bed, below the level of the bladder, to keep the drainage unobstructed and avoid tube distortion. (2) Disinfect the urethral orifice with 0.5% iodine solution twice a day to relieve the patients' urinary irritation symptoms. Instruct the patient to clean the perineum with warm water and dry it with a clean cotton ball. (3) Observe the color, character, and quantity of urine, and record in detail. (4) Encourage the patient to drink more water, which can achieve internal irrigation of the urinary tract and prevent urinary tract infection. (5) Replace the sterile urine collection bag daily and empty it regularly to avoid urine reflux. (6) The patient should empty the bladder in time after removing the catheter, reduce the frequency of intermittent catheterization, and avoid urinary retention again. Although the patient experienced urinary retention before delivery and required catheterization to relieve symptoms, she was able to urinate quickly after the catheter was removed. The last indwelling catheter was removed 2 days after the cesarean section, and the patient returned to normal urination behavior.

### 3.6. Breastfeeding and Neonatal Care

The secretion of prolactin is closely related to maternal

psychological factors. Due to postpartum vesicoureteral reflux changes, lactating women are more likely to experience negative emotions, such as anxiety or depression. Therefore, it is especially important to provide mental and emotional support to the family, especially the husband. The nursing management of breastfeeding and neonatal care includes: (1) Giving the newborn early sucking and immediate contact after delivery, and ensuring that the baby stays with the mother for 24 hours. (2) Instructing the patient and her husband on breastfeeding skills and knowledge to address any issues that may arise during the process. (3) Guiding the patient on different breastfeeding positions, such as the football and cradle holds, and using various methods to relax the waist and back to relieve discomfort. (4) Observing the newborn's umbilical cord stump during each shift, assessing the frequency and duration of breastfeeding, the frequency of the newborn's stools and urine, and teaching the patient and their family how to care for the newborn at home. During hospitalization, it is important to ensure that the newborn is breastfeeding and swallowing well, with no choking, aspiration, or adverse complications, and is experiencing normal weight growth.

### 3.7. Psychological Nursing

The patient was hospitalized multiple times during pregnancy due to repeated urinary retention with indwelling catheters and abnormal urination behavior and form, leading to a significant decline in the quality of life and a huge psychological burden. Additionally, the patient had a history of four adverse pregnancies in the past and was worried that medication and auxiliary examination during pregnancy would have negative effects on the fetus and herself, resulting in psychological negative emotions such as tension and worry that further exacerbated the urinary retention symptoms. The patient's Self-rating Anxiety Scale (SAS) assessment score was 53 upon admission, indicating that she was in an anxious state. To address her psychological condition, the nurse fully empathized, listened, and provided emotional support, encouraged her to express her concerns, explained the etiology, pathology, and course of the disease to the patient and her family, and informed the patient of examination indicators in a timely manner. The patient was provided psychological counseling with mindfulness-based cognitive therapy, which helped regulate emotions and communication through various mindfulness techniques. Under the support of mindfulness-based psychology, the patient showed stable emotional expression, was able to actively cope with negative events during hospitalization, and the SAS score was reassessed at 71 points upon discharge.

## 4. Conclusions

Abdominal cocoon is a rare disease in clinical practice. As the pregnancy progresses, the bladder gradually increases due to adhesions between the bladder and uterus, along with the

effect of inflammatory stimulation. This leads to hypertrophy of the bladder muscle layer and severe urinary retention and dysuria, significantly reducing the patient's quality of life. Therefore, it is crucial to improve the management of pregnancy, select the appropriate delivery method, and provide detailed psychological care, monitoring, and education during the perinatal period. Additionally, preventing postoperative complications, providing timely breastfeeding guidance and continuous care after discharge are crucial for promoting maternal and infant rehabilitation.

## Abbreviations

AC	Abdominal Cocoon
IVF-ET	In Vitro Fertilization and Embryo Transfer
MDT	Multidisciplinary Team
UR	Urinary Retention
SAS	Self-rating Anxiety Scale

## Author Contributions

**Hui Yang:** Conceptualization, Writing-Original Draft Preparation, Writing-Review & Editing

**Rong Liao:** Writing-Original Draft, Preparation

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## Data Availability Statement

No data was used.

## Conflicts of Interest

The authors declare no conflicts of interest.

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## Biography



**Hui Yang** is a head nurse at The Second Xiangya Hospital of Central South University, Obstetrics Department. She completed her Master of nursing in Central South University in 2009. She has participated in multiple research collaboration projects on obstetric nursing and nursing management.

## Research Field

**Hui Yang:** Obstetric care, Postpartum recovery care, Diabetes mellitus care, Nursing management, Nursing education.

**Rong Liao:** Obstetric care, Diabetes mellitus care, Mental nursing, Traditional Chinese medical nursing, Nursing education.