

A Case Report of Bilateral Postoperative Inguinal Hernia Leading to Obstructive Azoospermia

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Abstract: The study focused on a case involving a patient with bilateral inguinal hernia and obstructive azoospermia, who was admitted to People's Hospital of Yide City Guangdong Province on November 24, 2022. A comprehensive analysis of the patient's condition was conducted, including the determination of the surgical plan and exploration and analysis of key points related to surgical treatment and perioperative nursing intervention. The patient underwent a combined microscopic and laparoscopic exploration of both vas deferens and epididymis, with left epididymal anastomosis and right vas deferens recanalization. High-quality nursing intervention was implemented during the perioperative period. After treatment, the patient's examination results returned to normal, and his overall condition showed significant improvement, leading to a smooth discharge.

Keywords: Inguinal hernia; Azoospermia; Obstruction; Case analysis

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1. Introduction

Obstructive azoospermia primarily results from the blockage of sperm transport caused by obstruction of the vas deferens. Patients typically exhibit low or absent sperm secretion and abnormal changes in sperm volume. The primary causes of obstructive azoospermia encompass inflammation of the reproductive system, congenital bilateral vas deferens atresia or obstruction, epididymal duct agenesis, separation of the epididymis from the testis, vas deferens compression, inadvertent vas deferens injury during inguinal surgery, or perineal trauma. Notably, medical vas deferens injury stemming from inguinal hernia surgery stands out as the primary causative factor for this condition ^[1,2].

Clinical practice predominantly employs surgical treatments, especially inguinal hernia surgery, for obstructive azoospermia. To ensure the efficacy of surgical interventions, it is crucial to judiciously select the surgical approach and implement appropriate nursing interventions during the perioperative period ^[3]. This study focuses on a patient admitted to the People's Hospital of Yide City Guangdong Province, diagnosed with bilateral postoperative inguinal hernia leading to obstructive azoospermia. A detailed analysis of his medical records was conducted, and treatment and nursing programs were explored to provide valuable insights for

guiding clinical practice.

2. Case information

Patient Mr. Jiang, male, age 27 years old, was admitted to the hospital on November 24, 2022, due to his spouse's infertility, four months into their marriage. His semen analysis revealed a lack of sperm for the past two weeks.

Medical history: The patient reported a regular sex life since his marriage four months ago, with no issues such as erectile dysfunction, contraception use, ejaculation difficulties, premature ejaculation, or retrograde ejaculation. He denied experiencing urinary symptoms, scrotal cramps, or any abnormalities. Despite regular attempts, his spouse had not conceived. During an outpatient clinic review on November 23, 2022, an ultrasound examination revealed bilateral epididymis fine reticulation duct dilatation, indicating a possible vas deferens obstruction. Further assessment through transrectal prostate ultrasound showed bilateral enlarged seminal vesicles with glandular duct enlargement, leading to the diagnosis of obstructive azoospermia.

Past medical history: Mr. Jiang had no history of chronic diseases, infectious diseases, allergies to food or medications, trauma, or blood transfusion.

Personal history: There were no prevalent infectious diseases in Mr. Jiang's living area. He had no contact with infectious disease patients, toxic substances, or radioactive substances. Mr. Jiang reported no adverse habits.

Marital and family history: The patient is married, and the couple is childless. His spouse has no history of pregnancy, and there is no family history of similar diseases, hemophilia, thalassemia, mental illness, malignant tumors, or other genetic diseases.

Physical examination: The results of physical examination showed that the temperature (T) was 36.8°C, pulse (P) was 62 beats/min, respiratory rate (R) was 20 breaths/min, and blood pressure (BP) was 135/91 mm Hg. The patient presented with normal physical development, moderate nutrition, a smooth gait, natural expression, consciousness, and cooperative behavior during examination. The skin and mucous membrane tissues showed no signs of yellowish or pale discoloration, rashes, subcutaneous hemorrhages, or wounds. There was no enlargement of superficial lymph node tissues throughout the body. Head examination revealed no deformities, eyelid edema, eyebrow loss, bulbar conjunctival congestion, or edema. The eyes displayed normal movement, corneal transparency, equal-sized and round pupils, a sensitive light reflex, and a normal auricle. The nasal morphology was normal, lips were rosy, oral mucosa showed no ulceration or hemorrhage, and there was no enlargement of tonsils or pharyngeal congestion. The neck was soft and nonresistant, with a negative hepatic jugular venous reflux. The trachea was centrally positioned, and the thyroid appeared normal. Thoracic and abdominal examinations showed a symmetrical thorax without deformities, smooth and regular respiration, symmetrical respiratory motility bilaterally, clear sounds on percussion in both lungs and no wet or dry rales or pathologic murmurs in the valvular region. The abdomen was flat and soft, with no rebound pain or tenderness, a negative Murphy's sign, normal bowel sounds, and no mobile turbid sounds. Spinal limbs and neurological examinations indicated normal spinal limbs, no swelling in the lower limbs, presence of pharyngeal reflex, mandibular reflex, corneal reflex, normal muscle strength, normal muscle tone, normal sensory function, presence of muscle reflexes, knee reflexes, and periosteal reflexes. Additionally, there were no signs of meningeal irritation, and Babinski's sign was negative.

Specialized examination: During the specialized examination, the patient did not report any bulging in the region of both kidneys. The skin temperature was within normal range, and there was no evidence of pressure pain at the bilateral cribriform point and crib-waist point. No percussion pain was detected in both kidneys, and

there was no pressure pain in the bilateral ureters. A turbid sound in the bladder was observed under the pubic symphysis. The length of the surgical scar in the bilateral inguinal region was approximately 6 cm, without any nodules or secretion at the urethral orifices. Palpation of the testes bilaterally revealed no abnormalities, while firm nodules were palpated in the caudal part of the epididymis. The scrotal segment of vas deferens bilaterally could be palpated, with no observable beaded changes or varicose vein masses in the scrotum bilaterally. Additionally, the Valsalva maneuver was negative.

Auxiliary examination: On November 10, 2022, the semen analysis indicated a volume of 5 mL, a liquefaction time of 10 min, and a sperm density of 0. Subsequent examinations on November 15, 2022, conducted at other medical institutions revealed normal levels of sex hormones, a semen volume of 8 mL, and a liquefaction time of 30 min. However, the sperm density remained at 0. Results from tests for *Mycoplasma urealyticum* and chlamydia were negative. During a recheck at the outpatient clinic on November 23, 2022, a color ultrasound examination of the scrotum, testes, and spermatic vein was performed. The left testis measured approximately 45 mm × 17 mm, and the right testis measured about 43 mm × 18 mm, both exhibiting normal morphology, clear peritoneum, a smooth surface, and homogeneous hypoechoic testicular parenchyma. Color Doppler flow imaging (CDFI) revealed a stellate blood flow signal in the testis. Fine reticular ducts were observed to be dilated in both testes, and CDFI did not detect any abnormal blood flow signals. No isolated fluid dark areas were seen in the sheath lumen of the testes bilaterally, and the spermatic cords were not widened. Additionally, there were no varicose veins in the spermatic cords. The ultrasonographic diagnosis suggested bilateral dilatation of the fine reticular ducts of the testes, and obstruction of the vas deferens was considered.

Clinical diagnosis: The patient's initial diagnosis was obstructive azoospermia, with additional diagnoses of left epididymal obstruction and right vas deferens hypoplasia. The final diagnosis confirmed obstructive azoospermia, left epididymal obstruction, and right vas deferens hypoplasia.

3. Case analysis

Preoperative discussion and analysis comments:

- (1) Preoperative preparation: The preoperative preparation was meticulously completed, and the patient exhibited no contraindications to the surgery.
- (2) Indications for surgery. The patient's spouse experienced infertility after marriage, with two semen analyses revealing azoospermia. Hormone test results indicated normal testicular spermatogenesis, and ultrasound demonstrated bilateral vas deferens obstruction.
- (3) Surgical program: The proposed surgical intervention involved bilateral vas deferens and epididymis exploration under a microscope combined with laparoscopy. The plan included left vas deferens epididymal anastomosis and right vas deferens recanalization.
- (4) Proposed anesthesia plan: The anesthesia plan suggested static-aspiration compound general anesthesia.
- (5) Expected surgical outcome: The anticipated surgical outcome aimed to pinpoint the location of seminal tract obstruction and achieve surgical recanalization.
- (6) Surgical risk and disposition plan:
 - (a) Surgical risk:
 - Intraoperative operations pose a risk of damaging the vas deferens and spermatic cord blood vessels.
 - Joint laparoscopic exploration carries the potential for damage to internal organs within the

abdominal cavity.

- There is a heightened risk of postoperative complications, including incision infection, and spermatic cord and testicular adnexitis.

(b) Disposition:

- The physician is urged to execute all surgical procedures with precision, employing careful dissection and ensuring gentle movements.
- It is crucial to avoid unnecessary medical injury, particularly given the delicate nature of the vas deferens.
- Postoperative anti-infection treatment should be administered diligently to mitigate the risk of complications.

4. Discussion

The procedure of vasectomy is complicated, and improper operation can lead to damage of the vas deferens. Research data indicates the risk of infertility due to congenital hypoplasia of the vas deferens is notably higher when inguinal surgery is performed in childhood. In cases of inguinal hernia surgery, inadequate understanding of the internal anatomy of the inguinal canal, improper surgical techniques, and obscured visibility of the bleeding area can lead to ineffective separation of the hernia neck from the spermatic cord, resulting in structural and functional abnormalities in the vas deferens.

The conventional clinical approach for treating obstructive azoospermia arising from medically-induced vas deferens injury is vasectomy recanalization through open surgery. However, determining the length and precise site of obstruction in these patients is challenging. Some healthcare institutions have attempted vas deferens exploration and anastomosis through the inguinal region, but this approach is associated with high surgical difficulty and suboptimal outcomes. To address this issue, studies have proposed adjusting the surgical path to relocate the vas deferens above the pubic tubercle, facilitating tension-free anastomosis without strict length requirements.

In addressing vasectomy injuries, certain researchers have employed a combination of microsurgical techniques and laparoscopy, achieving a commendable 78% success rate in reopening the obstructed vas deferens. Building on these findings, this study took a similar approach, utilizing microscopic combined laparoscopic methods for bilateral vas deferens and epididymis exploration. The treatment plan encompassed left vas deferens epididymis anastomosis and right vas deferens recanalization. The positive outcomes from this approach were reflected in the patient's robust recovery. This study's findings lead to the conclusion that longer vas deferens defects can be effectively rectified through standardized laparoscopic surgical operation protocols. Precise separation of the severed ends was successfully accomplished, demonstrating the potential for reconstructing the reproductive tract. Notably, in patients with varying degrees of abnormality in the pelvic region, the anastomosis of the contralateral vas deferens proved to be a feasible and valuable component of achieving comprehensive reconstruction. This innovative treatment strategy offers promise for addressing diverse abnormalities in the pelvic region of the vas deferens and underscores the significance of tailored, meticulous surgical approaches for optimal patient outcomes.

The surgical management of bilateral inguinal hernia causing obstructive azoospermia encompasses three primary scenarios, each demanding a nuanced understanding of surgical intricacies by physicians.

- (1) Localized vas deferens damage: In cases where the vas deferens is simply cut or ligated, and the defective section is relatively short, surgeons can excise the scar-like tissue formed at the severed end

during the operation. Subsequently, necessary anastomosis can be performed. Microscopic assistance is crucial during the operation, employing the vasectomy surgical plan for optimal outcomes.

- (2) Extensive vas deferens damage: When the vas deferens damage is extensive, entering the inner pelvis and separating the inner ring region becomes challenging. For managing long vas deferens defects, a traditional open surgical plan can be employed. This involves relocating the injured area to the seminal vesicle, carefully removing it through the outer ring, and conducting anastomosis post-operation. Although this approach requires a slightly larger incision, it effectively addresses lesions on both sides simultaneously.
- (3) Secondary epididymal obstruction: Surgically treating secondary epididymal obstruction poses increased difficulty. Surgeons should prioritize vasovasostomy (VV) completion, and if postoperative examination reveals no spermatozoa, vasography can confirm vas deferens patency before performing vasoepididymostomy (VE). A precise understanding of surgical nuances is imperative in these cases.

With the advancement of minimally invasive surgical techniques, laparoscopic procedures have gained prominence. Researchers have successfully utilized laparoscopy to free the distal vas deferens inside the pelvis, leading it out through the other ring area, and completing anastomosis under the microscope. This approach demonstrates promising results and contributes to the expanding scope of minimally invasive surgical applications.

Managing vas deferens injuries demands a tailored approach considering the patient's condition. Cross-anastomosis operations, while complex, can be considered. However, due to the intricacies involved, widespread adoption in medical institutions may pose challenges. Surgeons are encouraged to adapt strategies based on patient characteristics and leverage evolving minimally invasive techniques for enhanced surgical outcomes.

In this case, intraoperative exploration revealed left epididymal obstruction and right vas deferens hypoplasia, successfully alleviating the obstruction through surgical treatment. Upon discharge, the patient exhibited no evident pain in the surgical incision or bilateral testes, and there were no signs of pus or redness in the urethral orifice. The absence of abdominal distension, fever, cough, sputum, and other symptoms indicated a favorable recovery. Vital signs remained stable, and the patient's mental state was positive. Importantly, sperm presence was observed in the semen.

Inguinal hernia surgery, a primary cause of obstructive azoospermia, can be effectively addressed through surgery. The utilization of microscopic combined laparoscopic bilateral vas deferens and epididymis exploration, left vas deferens and epididymis anastomosis, and right vas deferens recanalization represents a minimally invasive surgical technique. This approach offers the advantages of minimal invasiveness and a clear surgical field of vision, ensuring precise alignment of the mucosal tissues of the vas deferens lumen. Importantly, it mitigates the issues associated with microtissue embedding, contributing significantly to the success rate of vas deferens recanalization ^[4-6].

To ensure the efficacy of surgical treatment, comprehensive patient assessment before surgery is essential. During surgery, a gentle approach is imperative, aiming to prevent edema and infection for the anticipated treatment effect ^[7,8]. Effective perioperative nursing interventions are crucial. Preoperative preparations involve thorough health education and addressing patient queries about the operation. Postoperatively, nursing staff meticulously monitor vital sign changes, ensuring smooth respiration and drainage. Patients are guided on reasonable diet and exercise, following the doctor's instructions for medication. Nursing staff provide post-discharge review information and precautions to secure the desired prognosis ^[9,10].

5. Conclusion

Postoperative bilateral inguinal hernia leading to obstructive azoospermia is categorized as a sperm transportation disorder resulting from medical injury, posing potential adverse effects on patients' lives. Microscopic combined laparoscopic surgery, as a minimally invasive surgical technique, proves effective in precisely addressing the obstruction. However, the technical aspects of the operation and perioperative nursing interventions demand stringent adherence to protocols. Therefore, it is imperative to enhance the perioperative comprehensive assessment of the condition, develop a thorough surgical and nursing plan, and continually refine these measures in practice. This approach ensures the successful restoration of the patient's condition.

Disclosure statement

The author declares no conflict of interest.

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