Nursing Care of One Case of Right Renal Cancer with Level IV Inferior Vena Cava Tumor Thrombus

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Abstract

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Nursing Care for a Case of Right Renal Carcinoma with Inferior Vena Cava Grade IV Tumor Thrombus

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Abstract

This paper reports the nursing process for a patient with right renal carcinoma complicated by an inferior vena cava (IVC) grade IV tumor thrombus. The nursing care encompassed comprehensive interventions including preoperative psychological support, management of embolic and coagulation function, prevention of complications, intraoperative cooperation, and postoperative dynamic monitoring, dietary management, pain control, and complication surveillance. Following implementation of this nursing protocol, the patient achieved stable condition, and both the patient and family expressed satisfaction with the treatment outcomes.

Keywords: Right renal carcinoma; Inferior vena cava grade IV tumor thrombus; Nursing care

Introduction

Renal carcinoma is a common malignant tumor in urology that frequently forms tumor thrombi in the inferior vena cava. Importantly, IVC tumor thrombus is not an independent risk factor for poor oncological prognosis, and surgical treatment remains the most scientific and effective approach for patients with renal carcinoma complicated by IVC tumor thrombus [1,2]. As surgical intervention constitutes a critical therapeutic modality, targeted perioperative nursing care tailored to the disease pathology and surgical trauma represents a key determinant of surgical success and postoperative recovery [3,4]. A grade IV tumor thrombus, which extends above the diaphragm, requires combined abdominal and thoracic management. The surgical treatment of right renal carcinoma with IVC grade IV tumor thrombus carries substantial difficulty and risk, necessitating specialized nursing interventions. Therefore, nursing management must involve rigorous patient monitoring, and targeted perioperative nursing interventions can significantly reduce major complications while promoting favorable postoperative recovery [5]. Our department admitted one such patient, and through effective preoperative, intraoperative, and postoperative nursing interventions, achieved excellent outcomes with successful discharge. The case is reported as follows.

1. Case Presentation

1.1 Patient Information Ms. Guo, a 52-year-old female, presented with sudden onset of gross hematuria one month prior to admission. The urine appeared bright red with clots, accompanied by abdominal distension, anorexia, and generalized fatigue. The patient experienced a 5-kg weight loss within one month and subsequently presented to the urology department.

1.2 Diagnostic Findings Following admission and comprehensive evaluation, the patient was diagnosed with right renal carcinoma with IVC grade IV tumor thrombus. The tumor had invaded the inferior vena cava—the largest vessel in the human body—and extended superiorly along the blood flow to the entrance of the right atrium. The thrombus measured 15 cm in length and 4 cm at its maximum width. Diagnostic workup confirmed no distant metastasis of the renal carcinoma.

[Figure 1: see original paper] CT scan axial image of right renal carcinoma and inferior vena cava tumor thrombus

1.3 Surgical Treatment and Outcomes In response to the patient's complex condition, the hospital convened four multidisciplinary team (MDT) meetings and utilized a remote medical consultation platform for extensive expert

discussion. The final treatment strategy was determined to be comprehensive therapy centered on surgical intervention. The specific surgical plan included: (1) Digital subtraction angiography (DSA)-guided embolization of the right renal artery and IVC tumor thrombus feeding vessels, followed by radical nephrectomy, retroperitoneal lymph node dissection, pericardiotomy with temporary occlusion of the IVC-right atrial junction, and IVC tumor thrombectomy; (2) Adjuvant therapy with targeted molecular therapy and biologic immunotherapy postoperatively.

This surgical procedure carried exceptionally high risk and technical difficulty. The primary challenges included: intraoperative tumor thrombus detachment potentially causing acute pulmonary embolism and cardiopulmonary arrest; management of distal thrombus; determination of the need for cardiopulmonary bypass; risk of massive hemorrhage during IVC venotomy, which could threaten patient survival; and postoperative prevention of hepatic and renal failure.

The surgical approach commenced with DSA-guided embolization of the right renal artery and tumor thrombus feeding vessels. The patient was then transferred to the operating suite for preoperative preparation and anesthesia induction with intravenous access establishment, followed by sequential abdominal and thoracoabdominal procedures.

Postoperatively, the patient was transferred to the intensive care unit (ICU). On postoperative day 3, she was transferred to the general urology ward for continued treatment and nursing care. By postoperative day 4, the patient was ambulating independently. She achieved complete recovery at two weeks post-surgery. At the three-month follow-up, imaging revealed no tumor recurrence at the surgical site, no distant organ metastasis, and a patent IVC lumen. The patient had returned to normal daily activities.

2. Nursing Methods

The comprehensive treatment protocol involving DSA-guided embolization, radical nephrectomy, lymph node dissection, pericardiotomy with IVC occlusion, and tumor thrombectomy represents the most challenging procedure in urologic surgery, carrying extremely high risk. This complexity demands not only advanced surgical expertise but also exceptional physical and psychological preparation of the patient. Consequently, implementing comprehensive and effective perioperative nursing interventions based on the patient's specific condition and surgical characteristics is essential.

2.1 Preoperative Nursing

2.1.1 Psychological Nursing The 52-year-old patient's authorized representative was her husband. During the diagnostic period, despite cooperating with examinations and nursing procedures, the patient experienced significant

fear and anxiety regarding her disease and treatment, particularly after learning about the surgical complexity and timeline. Although family encouragement provided temporary relief, she repeatedly experienced tension and anxiety, demonstrating marked emotional lability and consequently adopting a negative, avoidant attitude toward healthcare providers. In response, the nursing team conducted targeted nursing rounds and, after thorough communication with the attending physician, provided detailed education to the patient and family regarding the surgical management of right renal carcinoma with IVC grade IV tumor thrombus and postoperative care measures. The patient was actively involved in developing and refining the perioperative nursing plan. Through comprehensive pre-communication and preparation, the primary physician and specialized nurses established trust through their professional competence. By expressing her fears and emotional distress to the nursing staff, the patient achieved substantial psychological relief. These psychological interventions significantly alleviated negative emotions, enhanced treatment confidence, and improved patient cooperation with therapeutic and nursing measures, laying a foundation for successful surgical completion [6].

2.1.2 Coagulation Function and Embolism Surveillance With the right renal carcinoma thrombus extending into the IVC and reaching the right atrial entrance, perioperative nursing required vigilant monitoring for tumor thrombus or filter detachment to prevent cardiopulmonary embolism. Patients were instructed to avoid activities that could suddenly increase intra-abdominal pressure, including forceful urination or defecation, vigorous coughing, and substantial physical movement. Vital signs were closely monitored, particularly for dyspnea or other respiratory symptoms, with timely vascular assessment as indicated. Additionally, coagulation parameters were monitored for bleeding risk, invasive procedures were minimized, and local compression hemostasis was reinforced when necessary.

2.1.3 Preoperative Complication Prevention Given the surgical complexity involving the kidney, heart, liver, and major vessels, combined with significant preoperative weight loss, the patient's risk for postoperative complications was substantially elevated. Preoperatively, existing pulmonary and urinary tract infections were treated according to physician orders, with guidance on perineal hygiene and respiratory function exercises including sputum expectoration training. To prevent embolic events, preoperative risk assessment was performed, lower extremity venipuncture was avoided, and appropriate positioning was assisted to minimize embolism risk.

In accordance with the multidisciplinary treatment approach, the nursing team participated in preoperative MDT meetings and preparations to comprehensively evaluate potential intraoperative and postoperative scenarios and develop targeted nursing protocols.

2.2 Intraoperative Cooperation and Nursing This multidisciplinary surgical procedure demanded high standards for equipment, instruments, personnel, supplies, and intraoperative coordination. During the operation, nursing staff assisted with operating room and anesthesia preparation, preoperative visits, and ensured completeness of surgical instruments and supplies while providing intraoperative monitoring and coordination. Effective nurse-physician collaboration resulted in no intraoperative tumor thrombus detachment. Special attention was given to fluid management due to significant central venous pressure fluctuations during surgery.

2.3 Postoperative Nursing

2.3.1 Dynamic Monitoring and Nursing Following surgery, the patient was transferred to the ICU for specialized care with targeted nursing interventions. The extensive surgical procedure significantly impacted cardiopulmonary function, necessitating short-term ventilatory support due to residual anesthesia effects, hemodynamic stabilization requirements, and absence of spontaneous recovery of breathing, which elevated postoperative monitoring demands [7]. Nursing care encompassed routine monitoring of vital signs, urine output, and oxygen saturation, as well as assessment of radial artery pressure, blood gas analysis, and biochemical parameters to evaluate cardiac and renal function. These data guided determination of total fluid volume and infusion rate to maintain water-electrolyte and acid-base balance. Early discontinuation of invasive monitoring was beneficial once the patient's condition stabilized, facilitating transfer to the general ward. This patient remained in the ICU until postoperative day 3, when stable parameters permitted transfer to the general urology ward.

2.3.2 Dietary Management Postoperative fasting was maintained until intestinal function recovered. To prevent constipation, patients were instructed to consume small, frequent meals with easily digestible foods, fresh vegetables, and fruits to ensure bowel regularity. Spicy and irritating foods were prohibited, and meals were taken on a regular schedule.

2.3.3 Pain Management Postoperatively, patients were assisted to maintain a comfortable lateral position on the non-operative side to reduce pressure on the surgical incision. Analgesic medications were administered for pain control. During postoperative coughing, expectorants were used or patients were instructed to place both hands over the incision for gentle compression to facilitate effective sputum clearance while reducing tension and discomfort.

2.3.4 Complication Surveillance and Nursing

(1) Intraoperative vascular wall injury risk necessitated heparinization; therefore, postoperative monitoring focused on preventing cardiopulmonary embolism, hemorrhage, arrhythmias, and heart failure. (2) Targeted fluid

management was implemented based on monitoring of temperature, respiratory and circulatory status, blood biochemistry, and hepatic and renal function parameters to maintain intake-output balance. (3) Given the extensive surgical incision and presence of pericardial, mediastinal, renal fossa drainage tubes, and urinary catheter, specialized drainage care was provided to ensure patency, with observation and documentation of drainage fluid characteristics and volume, and immediate physician notification for sudden output increases [9]. (4) Upper extremity or jugular venous infusion was utilized postoperatively, with renal function monitoring; lower extremity exercises were assisted when circulatory compromise was detected [10]. (5) Postoperative pain-related respiratory complications were managed through proper sputum expectoration instruction, assisted turning and back percussion, hemostatic medications, and prevention of hemorrhage and pulmonary infection. (6) Anesthesia-induced gastrointestinal motility inhibition with gastric content retention was addressed by instructing patients to consume easily digestible foods.

2.4 Health Education

(1) Lifestyle modifications included nutritional enhancement, physical conditioning, cold prevention, adequate rest, moderate activity, and avoidance of heavy labor. (2) Patients were instructed to monitor urine color and seek immediate medical attention if hematuria recurred. (3) Medication adherence, regular follow-up, and cautious use of nephrotoxic drugs were emphasized.

Discussion

As the most challenging procedure in urologic surgery with extremely high risk, multidisciplinary collaboration is essential for risk reduction and optimization of surgical outcomes and patient recovery [10]. Through health education promotion, patients' disease-related knowledge has improved, shifting from passive acceptance to active participation in care planning with expectation of respect and understanding. Involving patients in perioperative nursing protocol development is particularly crucial [11]. Given the high surgical risk and significant psychological impact, targeted health education and psychological nursing for hospitalized patients with renal carcinoma and IVC tumor thrombus are of paramount importance [11]. The development and implementation of targeted perioperative nursing interventions with enhanced monitoring and observation facilitated successful discharge. These targeted nursing measures effectively prevented postoperative complications and promoted early recovery [12,13].

Under the modern medical model, continuous advancement in diagnostic technology and therapeutic equipment has improved the management of previously difficult malignant diseases, significantly enhancing clinical outcomes and quality of life [14,15]. Right renal carcinoma with IVC tumor thrombus represents the most challenging urologic procedure, demanding not only advanced surgical

expertise but also optimal patient physical and psychological preparation. Comprehensive perioperative nursing interventions based on individual patient conditions and surgical characteristics are therefore essential [15,16]. From admission through preoperative preparation, intraoperative coordination, and postoperative monitoring to early rehabilitation, each phase of nursing intervention for this patient was collaboratively developed by specialized nurses, representing a successful case of multidisciplinary collaborative treatment and nursing. Contemporary healthcare increasingly utilizes specialized nursing consultations, which both maximize the value of specialized nurses and optimize perioperative nursing protocols [6,7].

Furthermore, health education and psychological support were extended to the patient's family during the perioperative period, which proved important for improving their understanding of the disease and alleviating negative emotions [17,18]. In summary, perioperative nursing care for patients with right renal carcinoma and IVC tumor thrombus reduces complication rates, shortens hospitalization duration, and promotes favorable recovery, demonstrating significant value for clinical application and dissemination [17]. Additionally, actively involving patients in treatment and nursing protocol development, particularly in critical and complex cases, enhances treatment compliance and cooperation while optimizing nurse-patient relationships, thereby benefiting patient care, disease resistance, and overall healthcare delivery.

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