

Nursing Care of a Patient with Massive Postoperative Hemorrhage Complicated by Lower Extremity Arterial Embolism after Deep Neck Abscess Surgery

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Abstract

This study retrospectively reviewed the treatment and nursing management of a patient with deep neck abscess who developed postoperative massive hemorrhage complicated by left lower limb arterial embolism. Through surgical drainage, anti-infective therapy, and comprehensive nursing interventions including condition monitoring, health education, blood pressure management, and perioperative care, the key factors influencing treatment outcomes at different disease stages were analyzed. This case yielded the following important insights: 1) Prioritizing early control of neck infection is fundamental to treatment; 2) The complication risks associated with deep neck abscess require heightened attention, particularly in elderly patients and those with limited disease knowledge, necessitating enhanced thrombosis prevention and early screening to reduce complication incidence; 3) For infected patients with comorbidities such as hypertension, preventive measures against hemorrhagic and thrombotic complications should be emphasized to optimize treatment efficacy and improve prognosis.

Full Text

Nursing Management of a Patient with Postoperative Massive Hemorrhage from Deep Neck Abscess Complicated by Lower Limb Arterial Embolism

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Abstract

This article reviews the treatment and nursing care of a patient who experienced massive postoperative hemorrhage from a deep neck abscess complicated by left lower limb arterial embolism. Through surgical drainage, anti-infective therapy, and comprehensive nursing strategies—including condition monitoring, health education, blood pressure management, and perioperative care—we analyzed key factors influencing treatment outcomes at various disease stages. This case highlights three essential insights: (1) early and effective control of cervical infection is fundamental to successful treatment; (2) heightened vigilance for complications of deep neck abscesses is required, particularly in elderly patients and those with limited health literacy, emphasizing the importance of thrombosis prevention and early screening; and (3) infected patients with comorbidities such as hypertension require proactive measures to prevent bleeding and thrombotic complications, thereby maximizing therapeutic efficacy and improving prognosis.

Keywords: Deep neck abscesses (DNAs); postoperative hemorrhage of DNAs; hypertension; lower limb arterial embolism

Deep neck abscesses (DNAs) are severe infections resulting from bacterial invasion of the deep cervical fascia. Under the action of toxins and proteases released by bacteria and inflammatory cells, local fascia and soft tissues undergo necrosis, dissolution, and liquefaction, ultimately forming abscesses in the deep neck spaces. The disease has an acute onset, rapid progression, and concealed lesion location, making it prone to serious complications. Notably, when complicated by descending necrotizing mediastinitis, the mortality rate reaches 40%-76% [1-3]. Once DNAs develop, prompt incision and drainage combined with comprehensive postoperative care and infection control are critical for preventing disease progression. However, failure to implement timely and appropriate treatment and nursing measures may lead to persistent inflammation and further spread of the deep neck infection to surrounding spaces, potentially invading major vessels and causing life-threatening hemorrhage [4]. Our department admitted a patient who experienced massive hemorrhage and concurrent left lower limb arterial embolism following incision and drainage of a neck abscess. Through aggressive treatment and meticulous nursing care, the patient's infection and bleeding were effectively controlled, but ischemic necrosis of the left lower limb still developed, ultimately necessitating amputation. We report our nursing experience below.

1 Case Report

The patient was a 79-year-old female who was admitted to our hospital's vascular surgery department on June 1, 2023, with a diagnosis of "left lower limb arterial embolism following incision and drainage of a left neck purulent mass." One week prior to admission, she had undergone incision and drainage for DNAs at

a local hospital. Two days after that procedure, she developed swelling of the left lower limb and was transferred to our vascular surgery department. She had a one-year history of hypertension. On admission, her vital signs were as follows: temperature 36.4°C, pulse 105 beats/min, respiration 18 breaths/min, and blood pressure 174/93 mmHg. Laboratory tests revealed a white blood cell count of 17.82×10^9 /L with a neutrophil percentage of 87.8%. The left lower limb exhibited persistent numbness, pain, coolness, and weakness. Vascular ultrasound confirmed partial arterial embolism of the left lower limb. She was started on piperacillin-tazobactam for anti-infective therapy, combined with vasodilators and low-molecular-weight heparin for anticoagulation.

On June 6, she was transferred to our department due to “purulent neck infection with massive hemorrhage.” An emergency incision and drainage of the neck abscess with hemostasis was performed under general anesthesia. Postoperative management included anti-infective therapy, anticoagulation, fluid resuscitation, and blood pressure control. Daily wound dressing changes were performed until no obvious pus was observed, swelling subsided, neck pain alleviated, and vital signs stabilized, with no bloody drainage from the left neck incision. After consultation with vascular surgery, the patient was advised to undergo surgical thrombectomy for the left lower limb arterial embolism, but she refused and was discharged against medical advice on June 13. Although her DNAs completely resolved after discharge, ischemic symptoms of the left lower limb progressively worsened. She was readmitted on July 10 for “left lower limb angiography, percutaneous thrombectomy, and balloon angioplasty.” Despite these interventions, ischemic necrosis of the left lower limb developed. To prevent sepsis and systemic infection, a left above-knee amputation was ultimately performed on July 18. The patient’s condition stabilized two weeks postoperatively, and she was discharged on August 2.

2 Nursing Care

2.1 Nursing Care for Deep Neck Abscess

2.1.1 Anti-infective Therapy Early and effective infection control is crucial for preventing complications and promoting recovery. The neck has abundant blood vessels and numerous interconnected fascial spaces, facilitating rapid infection spread and potential invasion of cervical vessels that can trigger massive hemorrhage. In this patient, delayed treatment exacerbated the infection, prolonged the disease course, and—combined with advanced age and hypertension—elevated inflammatory factors and blood viscosity, creating a high risk for thrombotic complications. Nursing priorities included close monitoring of vital signs, coordinating with physicians for standardized antimicrobial administration, and performing regular local dressing changes to effectively control the infection.

2.1.2 Nursing Care of Neck Abscess Drainage Tube and Wound Incision and drainage is the key intervention for controlling DNAs. Once an abscess

forms, prompt drainage is essential to reduce tissue pressure and prevent further inflammatory spread. Due to the rich vascularity of the neck, postoperative wounds are prone to bleeding, necessitating enhanced observation of the cervical wound site. Inadequate drainage can worsen infection and precipitate serious complications. Nursing measures included monitoring wound dressing for bleeding and drainage, measuring the amount and characteristics of drainage fluid, timely dressing changes, and assessing wound healing. Patients must avoid excessive head and neck movement, maintain proper drainage tube position, and have drainage recorded regularly. Nurses also monitored relief of pharyngeal pain and swelling, promptly alerting physicians to any issues requiring intervention.

2.2 Nursing Care for Lower Limb Arterial Embolism

2.2.1 Basic Nursing Care Lower limb arterial embolism clinically manifests with the “5P” symptoms: pain, pallor, pulselessness, paresthesia, and paralysis. In addition to high mortality, lower limb arterial embolism carries a 12% amputation rate, posing a severe threat to life [5]. In Traditional Chinese Medicine, lower limb arterial embolism belongs to the category of “tuo ju” (gangrene), which is rooted in spleen-kidney deficiency with cold-dampness and external injury as secondary factors. The main pathogenesis involves blood stasis and meridian obstruction, classified into patterns of cold-dampness obstructing collaterals, blood vessel stasis, damp-heat toxin excess, heat toxin injuring yin, and qi-yin deficiency. During the nursing period, vital signs required close monitoring, with proper dietary arrangements and maintenance of regular bowel habits. Nurses carefully observed arterial pulses in the affected limb, as well as changes in pain, swelling, skin temperature, and color. The limb was protected from cold and kept warm, but heating pads were prohibited to prevent injury. Bilateral limb circumference was measured every 6–8 hours to facilitate early detection of changes. Additionally, regular lower limb vascular ultrasound examinations were performed to assess thrombosis and provide evidence for subsequent treatment.

2.2.2 Perioperative Nursing Care for Lower Limb Arterial Embolism

Perioperative nursing care for lower limb arterial embolism is critical, especially when patients have insufficient understanding of their condition, requiring patient guidance and education from nursing staff.

2.2.2.1 Preoperative Care

Many patients with lower limb arterial embolism delay seeking medical care due to lack of understanding, even harboring unrealistic expectations about surgical treatment. Nurses must provide thorough education to help patients and families recognize the dangers of lower limb arterial embolism, emphasizing the importance of timely surgery to prevent further embolization or serious complications. It is particularly crucial to inform patients that without prompt treatment, blood supply interruption may lead to limb ischemic necrosis and

even amputation. Nurses should explain the surgical procedure, expected outcomes, and postoperative recovery requirements in detail to enhance patient confidence and ensure cooperation with preoperative preparations.

2.2.2.2 Intraoperative Care

Patients often experience significant psychological burden regarding surgery, particularly elderly patients. Nurses should provide psychological support during the procedure, reassure the patient, explain the necessity and safety of the operation, and ensure continuous vital sign monitoring to guarantee patient safety.

2.2.2.3 Postoperative Care

Following thrombectomy, patients are instructed to remain on bed rest for 24 hours, with close observation for bleeding at the puncture site. Fluid intake is guided according to the patient's condition to promote excretion of contrast agents. Nurses must closely monitor the affected limb, particularly skin temperature, sensation, color changes, pain level, and arterial pulses, to prevent complications. Effective communication is maintained with patients and families to explain the importance of postoperative care, especially regarding avoidance of pressure on the affected limb and proper warming techniques. Functional exercises are prescribed based on cardiac function assessment, guiding patients through passive or active limb flexion and joint activities to promote lower limb circulation [6]. Effective nursing measures during treatment enhance therapeutic outcomes, facilitate early rehabilitation, and prevent complications [7].

2.2.3 Patient Education and Guidance for Lower Limb Arterial Embolism Patient education for lower limb arterial embolism is particularly important, as elderly patients often lack relevant knowledge and fail to recognize symptoms promptly, leading to treatment delays. Nurses must provide one-on-one education to ensure patients and families fully understand the risks of lower limb arterial embolism and the serious consequences of delayed treatment. Key educational points include:

- (1) **Early Symptom Recognition:** Instruct patients and families to watch for abnormal lower limb symptoms such as pain, numbness, coolness, pallor, or abnormal sensations while walking, and to seek medical attention promptly.
- (2) **Disease Severity:** Explain the dangers of lower limb arterial embolism, emphasizing that without timely treatment, complete arterial blockage may occur, leading to severe ischemia, necrosis, and potential amputation.
- (3) **Importance of Prompt Medical Care:** Advise patients to seek immediate medical attention upon experiencing lower limb discomfort such as swelling, pain, or numbness to prevent disease progression and avoid amputation risk.
- (4) **Appropriate Treatment and Surgical Timing:** Help patients and

families understand treatment options, explaining in detail the necessity of interventional procedures or thrombolytic therapy based on disease severity, and emphasizing treatment timeliness to avoid delays.

- (5) **Lifestyle Modifications:** Guide patients to improve lifestyle habits, including maintaining a balanced diet, controlling weight, quitting smoking, limiting alcohol consumption, and engaging in appropriate exercise to maintain healthy vascular status and prevent embolism recurrence.

Nurses should combine specific disease conditions with simple, understandable communication to help patients and families develop positive attitudes toward treatment, reduce fear, and enhance compliance. Additionally, regular follow-up should be strengthened to monitor disease progression and provide necessary guidance and support. Through enhanced education and nursing care, early symptom recognition and timely treatment can help prevent progression to irreversible ischemic necrosis and avoid amputation.

2.3 Blood Pressure Control and Education

This patient had a history of hypertension with poor medication adherence and presented with elevated blood pressure on admission. Under physician guidance, nifedipine sustained-release tablets were administered to control blood pressure, with timely dosage adjustments to maintain levels below 140/90 mmHg. Nurses actively provided hypertension health education to establish good blood pressure management awareness, including guidance on diet, exercise, and medication use.

2.4 Psychological Nursing

Psychological nursing care for patients and their families is essential, as elderly patients are prone to anxiety due to disease complexity. Nurses should communicate in accessible language, encourage patients to express their concerns, and provide timely psychological counseling to maintain emotional stability, promote mental well-being, alleviate negative emotions, and enhance treatment compliance.

2.5 Dietary Nursing

Due to surgery and infection, patients experience a hypermetabolic state, making proper dietary nursing crucial. Nurses should provide education based on the patient's condition, gradually adjusting the diet to be low-salt, low-fat, low-sugar, and vitamin-rich while avoiding spicy and irritating foods.

Deep neck abscesses are often limited to small areas of cellulitis in the early stage, and infection can be effectively controlled if detected and treated promptly. The development of DNAs is closely associated with inadequate personal awareness, poor hygiene, advanced age, and comorbidities such as hypertension and hyperglycemia. Clinical practice must focus on high-risk patients and implement

targeted nursing to prevent disease progression [8, 9]. Early administration of adequate anti-infective therapy and incision and drainage can help control the disease and improve prognosis. However, delayed or improper treatment may lead to inflammatory spread, serious complications, and even life-threatening consequences [10]. In this case, the patient ignored the local infection, had poor blood pressure control, and lacked thrombosis prevention awareness during treatment, resulting in rapid deterioration of the neck infection, postoperative massive hemorrhage, complicated by left lower limb arterial embolism, and eventual amputation. Therefore, early prevention, detection, and treatment should be strengthened for elderly patients with multiple comorbidities. Through simple and understandable communication, disease awareness should be improved to guide families and patients in making scientific decisions [10], while psychological nursing should be implemented to reduce anxiety and promote early recovery.

Patient Consent and Ethics: Publication of this case report was approved by the patient and family, and authorized by the Ethics Committee of Rizhao People' s Hospital (Approval No.: MR-14-01).

Conflict of Interest Statement: The authors declare no conflicts of interest.

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Note: Figure translations are in progress. See original paper for figures.

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