Observation and Nursing Care of Lower-Limb Venous Thrombosis in One Patient with Lung Adenocarcinoma Undergoing Targeted Therapy

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Abstract

This paper summarizes the nursing intervention experience for lower-extremity venous thrombosis in one patient with lung adenocarcinoma undergoing targeted therapy. Through intervention measures including acute-phase thrombosis management, medication therapy nursing, psychological support, and health education, the patient was able to understand the disease during hospitalization, reduce thrombosis-related complications, prevent thrombosis recurrence and extension, improve treatment adherence, balance anticoagulation risks to ensure the continuity of anticancer therapy, enhance psychological adaptation and coping ability, strengthen confidence in treatment and adherence, improve symptom self-management, and promote a healthy lifestyle. After 10 days of treatment and nursing care, the patient' s condition improved and the patient was discharged.

Full Text

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【Abstract】 This paper summarizes the experience of nursing interventions for lower-limb venous thrombosis in one patient with lung adenocarcinoma undergoing targeted therapy. Through interventions including acute-phase thrombosis management, medication-treatment nursing care, psychological support, and health education, the patient gained an understanding of their disease during hospitalization; thrombosis-related complications were reduced; recurrence and extension of thrombosis were prevented; treatment adherence was improved; and anticoagulation risks were balanced to ensure continuity of anticancer therapy. The interventions also enhanced psychological adjustment and coping ability, strengthened confidence in treatment and adherence, improved self-management of symptoms, and promoted a healthy lifestyle. After 10 days of treatment and nursing care, the patient' s condition improved and the patient was discharged.

【Keywords】 lung adenocarcinoma; targeted therapy; lower-limb venous thrombosis; nursing intervention

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【Summary】We share our experience in nursing intervention for a lung adenocarcinoma patient undergoing targeted therapy who developed lower limb venous thrombosis. Through acute-phase thrombosis management, medication care, psychological support, and health education interventions, the patient learned about their condition during hospitalization, reduced thrombosis-related complications, prevented recurrence and progression of clots, improved treatment adherence, and balanced anticoagulation risks to ensure continuous cancer treatment. The interventions also enhanced psychological adaptation and coping skills, boosted confidence and adherence, improved self-management of symptoms, and promoted a healthy lifestyle. After 10 days of treatment and care, the patient' s condition improved, and they were discharged.

【Keywords】Lung adenocarcinoma, targeted therapy, lower limb venous thrombosis, nursing intervention

Lung adenocarcinoma is a common clinical type of lung cancer[1] and belongs to non-small-cell lung cancer. Patients with lung adenocarcinoma account for more than half of all patients with lung cancer, and its incidence is increasing year by year. Treatment modalities include surgery, radiotherapy, chemotherapy, and others; the most appropriate treatment plan should be selected according to each patient' s individual circumstances[2].

Targeted therapy is a precision treatment approach directed at specific "targets" in tumor cells. Its core principle is to use drugs or other therapeutic means to act specifically on abnormal molecules in cancer cells—such as gene mutations or abnormal protein expression—thereby inhibiting the growth, proliferation, or metastasis of cancer cells while minimizing damage to normal cells. In recent years, emerging therapies such as targeted therapy and immunotherapy have continued to achieve breakthroughs in other tumors[3]. At present, there is a greater tendency to combine targeted drugs represented by EGFR-TKIs (epidermal growth factor receptor tyrosine kinase inhibitors) with radiotherapy[3].

Pralsetinib, as a highly selective RET inhibitor developed specifically for patients with tumors harboring RET gene alterations, is used to treat patients with RET-altered non-small-cell lung cancer, thyroid cancer, and other solid tumors[4]. During pralsetinib administration, adverse reactions such as hypertension, fatigue, decreased white blood cell count, and anemia may occur. Therefore, attention should be paid to monitoring the patient' s blood pressure—especially in patients with underlying hypertension, whose blood pressure should be well controlled before pralsetinib treatment—as well as the patient' s

overall condition and relevant laboratory indicators. Medication education for patients should be strengthened, adverse reactions such as hypertension and fatigue should be properly managed, and patients' medication-related risks should be reduced[5].

Lower-limb venous thrombosis is commonly seen in patients with long-term bed rest, prolonged sitting and immobility,

surgical trauma, pregnancy, malignant tumors, obesity, and advanced age. After thrombosis forms, it may lead to symptoms such as lower-limb swelling, pain, elevated skin temperature, and superficial venous dilatation. If the thrombus dislodges and enters the pulmonary artery with the bloodstream, it may cause pulmonary embolism and may even be life-threatening[6]. In this regard, based on a case admitted to our department of a patient with lower-limb venous thrombosis during targeted therapy for lung adenocarcinoma, who improved and was discharged after targeted drug therapy and nursing interventions, the nursing experience is summarized as follows:

1: Medical history:

The patient was male, 62 years old, and was admitted mainly because of "lung adenocarcinoma discovered 5 years ago, with pain in the right lower limb for more than half a month." The patient had no cough, sputum production, or dyspnea. Physical examination: T: 36.5°C, P: 86 beats/min, R: 20 breaths/min, BP: 123/75 mmHg; clear consciousness and acceptable mental status; no abnormalities on chest examination; facial edema and mild edema of both lower limbs; distending pain in the right lower limb, pain score 3 points; right leg circumference: 32 cm, left leg circumference: 30 cm; skin temperature normal.

After admission, auxiliary examinations were performed: hemoglobin determination: 105 g/L; white blood cell count: 3.79 × 10^9/L. D-dimer + four coagulation tests indicated: plasma D-dimer: 1.35 ug/ml; fibrinogen: 1.74 g/l. The patient was given a low-salt, low-fat diet; continued regular pralsetinib 300 mg/qd targeted antitumor therapy; Leucogen to increase white blood cells; ferrous succinate to improve anemia; and other symptomatic treatments. After symptomatic liver-protective medication, reexamination showed that liver function had returned to normal. The patient was instructed to drink more water. A consultation with the Nutrition Department had been requested to adjust the patient' s dietary structure, and after discussion with the patient, oral Nutrison was given to enhance nutrition.

Lower-limb venous ultrasound: thrombosis of the right posterior tibial vein (acute phase: complete type) and thrombosis of the right calf intermuscular vein (acute phase: complete type). A vascular consultation had been requested. It was considered to stop aspirin, and to continue Puluojing 0.4 g/q12h and rivaroxaban 20 mg/qd for anticoagulant therapy. The patient was assisted in performing ankle-pump exercises. Nine days later, reexamination showed hemoglobin determination: 107 g/L; white blood cell count: 3.07 × 10^9/L. D-dimer + four coagulation tests indicated: plasma D-dimer: 1.30 ug/ml; fibrino-

gen: 1.74 g/l. Facial edema and mild edema of both lower limbs had improved compared with before. The right lower limb still had distending pain, with a pain score of 1 point; right leg circumference: 31 cm; left leg circumference: 30 cm; skin temperature normal.

2. Nursing measures:

2.1 Thrombus management in the acute phase:

2.1.1 Absolute bed rest: Provide the patient with a quiet and tidy resting environment, pay attention to controlling the indoor temperature, and maintain it at about 25°C. If the patient has a smoking habit, advise smoking cessation, because nicotine contained in tobacco can easily induce spasm of small blood vessels and affect the patient' s recovery. In terms of diet, instruct the patient to consume more foods that are low in fat and easy to digest, helping reduce blood viscosity and prevent worsening of lower-limb venous thrombosis. Easily digestible foods can keep the gastrointestinal tract unobstructed and prevent increased abdominal pressure from affecting venous return[7]. Daily water intake should be $ $1500 ml, with a high-fiber diet (to prevent increased abdominal pressure caused by constipation).

2.1.2 Positioning: Assist in elevating the affected limb by about 20° and flexing the knee joint by 15° to accelerate venous return and relieve swelling and pain in the affected limb. Observe leg circumference: measure the difference in circumference between the two lower limbs every 4 h (a difference of 1 cm suggests disease progression).

2.1.3 Exercise: Prohibit the patient from massaging the affected area or engaging in strenuous exercise to prevent embolus detachment. The patient may be assisted in performing ankle-pump exercises. Ankle-pump exercise refers to an exercise therapy in which the patient actively performs movements such as excessive flexion and extension of the ankle joint, thereby promoting blood circulation and lymphatic return in the lower limbs. Through ankle-joint exertion, the foot is slowly moved through the maximum range: dorsiflexion about 30° for 3 s, inversion 30° for 3 s, eversion 30° for 3 s, plantar flexion about 45° for 3 s, and finally slow circumduction for 3 circles. Repeat the above movements for 5 sets, taking about 2 min. Perform 3 or 4 times per day, optimally after breakfast, lunch, and dinner and before sleep. It should be accompanied by music, and the patient may hold each position for 3 beats according to the musical rhythm. However, the specific exercise time should take into account the patient' s tolerance and should not impose a physiological burden on the patient[7].

2.1.4 Compression therapy: Bed rest can cause blood-flow stasis, which itself is a high-risk factor for DVT, whereas exercise

thus promoting venous return and preventing further extension of the thrombus. Acute DVT usually presents as sudden swelling and pain of the affected limb; edema of the affected limb, increased muscle tension, and elevated skin

temperature may occur. Pressure therapy applies continuous or intermittent compression to local areas of the body, promoting fluid circulation, reducing tissue edema, and accelerating the absorption of inflammation, thereby alleviating clinical symptoms[8].

2.1.5 Medication use: The diagnostic principles for VTE in patients with cancer are the same as those for patients without cancer. However, because D-dimer levels are usually elevated in patients with malignant tumors, D-dimer has limited value in the diagnosis of VTE. For anticoagulant therapy in patients with VTE complicated by cancer, low-molecular-weight heparin is more effective than vitamin K antagonists[9]. For patients whose condition is recovering well, active mobilization should be encouraged to avoid recurrent thrombosis. The degree of swelling of the affected limb should be measured and recorded daily, and external applications should be observed as adjunctive treatment. For patients with severe swelling of the affected limb, external application may be performed using a gauze bag containing 1 g borneol and 500 g mirabilite[10].

2.1.6 Nursing care for the prevention of pulmonary embolism: Lower-extremity venous thrombosis is prone to be complicated by pulmonary embolism, with an incidence of 20%–40%; 11% of patients with pulmonary embolism complications die within 1 h. However, the clinical manifestations are not obvious, with no specific symptoms or signs, and are easily confused with other diseases that cause cardiopulmonary dysfunction. Patients should be observed for the triad of pulmonary embolism, such as bloody sputum, cough, and sweating, as well as bloody sputum, chest pain, and dyspnea. If these symptoms occur, the possibility of pulmonary embolism should be suspected. When pulmonary embolism occurs, the patient should be placed supine and given emergency supportive care, such as monitoring of vital signs, high-flow oxygen inhalation, and establishment of venous access. If the patient has no contraindications to thrombolysis, combined thrombolytic therapy should be administered promptly[10].

2.2 Medication nursing:

2.2.1 Warfarin medication: Effects of food on the anticoagulant effect of the drug: Warfarin exerts its anticoagulant effect by interfering with vitamin K–dependent coagulation factors. Because the vitamin K content varies among different foods, the anticoagulant effect of warfarin may be weakened to varying degrees. Therefore, patients should be educated about dietary awareness, and their dietary structure should be reasonably controlled. Effects of other preparations: Vitamin K preparations can directly antagonize the anticoagulant effect of warfarin and induce a risk of embolism. Drugs such as the diuretic spironolactone and the sedative-hypnotic diazepam can promote the metabolism of warfarin in the body and weaken its anticoagulant effect[12].

2.2.2 Usage and precautions for the targeted drug pralsetinib: Before medication, the presence of RET fusion or mutation must be confirmed through genetic testing (with a clear target). The dose should be adjusted according to the patient' s tolerance, liver and kidney function, and other factors. The drug

must be taken orally as prescribed by the physician, once daily; it may be taken on an empty stomach or with food, but at a fixed time.

2.4 Psychological support:

Psychological guidance: Before admission, the patient had experienced pain in the right lower limb for more than half a month but did not come to the hospital for examination in time, indicating insufficient awareness of the disease. After admission education and disease-related popular science education, the patient realized that medical consultation should be sought promptly when symptoms occur. During hospitalization, patients with lower-extremity venous thrombosis are at risk of life-threatening pulmonary embolism; their emotions are often characterized by tension, anxiety, and pessimism, with a negative attitude toward life and unwillingness to cooperate with treatment. More care and consideration should be given to the patient, and ideological counseling should be carried out patiently so that the patient can maintain a good mood throughout, build confidence and hope for recovery, and actively cooperate with treatment[10]. Before discharge, the patient had some concerns about the home lifestyle. Guidance on ankle-pump exercises at home was provided, the patient was informed to return for reexamination in 2 weeks, and methods for continuing exercise at home were obtained.

2.5 Health education:

2.5.1 Strengthening publicity and education: The causes, degree of risk, and other information related to lung adenocarcinoma complicated by lower-extremity venous thrombosis should be explained to the patient to draw the patient' s attention. Relevant knowledge of lung adenocarcinoma and lower-extremity venous thrombosis should be popularized, such as common symptoms and complications, and the patient should be instructed to inform the physician or nursing staff promptly if related symptoms occur[11].

2.5.2 Treatment guidance: After discharge, the patient should be guided to implement the original treatment and rehabilitation plan, strictly follow the physician's instructions, take medication correctly on time and in the prescribed dose, avoid adverse reactions, and pay attention to changes in posture and condition. The patient should return to the hospital regularly for follow-up. At the same time, the patient should be guided in preventing complications; during the post-discharge period, prevention should receive even greater attention. Respiratory tract care should be emphasized, changes in temperature and weather should be noted, and colds should be avoided as much as possible[13].

2.5.3 Lifestyle guidance: During the post-discharge period, good living habits should be maintained, and the patient should actively cooperate with nursing staff in carrying out relevant

Relevant nursing care can effectively reduce the incidence of complications [13].

2.5.4 Feasibility of continuing care: Have the patient restate what they have learned, assess the degree to which they have mastered it, and ensure proficient mastery, thereby achieving a process of education–motivation–re-education. This can effectively improve the quality of life of discharged patients. By joining a continuing-care peer group for rehabilitation of chronic respiratory diseases, purposeful interactions can be established among nurses, patients, and even family members, thereby promoting and maintaining the patient' s health [14].

3. Summary:

After 10 days of comprehensive treatment and meticulous nursing care, the symptoms of lower-extremity venous thrombosis in this patient were markedly alleviated: the circumference of the affected limb decreased; skin color and temperature returned to normal; and no complications such as pulmonary embolism occurred. The patient and family members were satisfied with the treatment and nursing care. This case indicates that, for patients with lung adenocarcinoma receiving targeted therapy who develop lower-extremity venous thrombosis, nursing interventions should comprehensively consider multiple factors, including acute-stage thrombosis management, nursing care for pharmacologic treatment, prevention of complications, symptom management, nutritional and daily-life care, psychological support, and health education. Systematic nursing interventions can effectively promote patient recovery and improve quality of life.

Patient informed consent: Informed consent for publication of this case report was obtained from the patient.

Conflict-of-interest statement: The authors declare that there are no conflicts of interest in this article.

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