

Nursing case of necrotizing fasciitis in a patient with hypoproteinemia after spinal tumor resection



Case report

Yu Xu, Yao-Feng Zhu*

College of Medicine, Jishou University, Jishou, Hunan 416000, China

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Abstract: Objective: To summarize the nursing experience of a patient with necrotizing fasciitis (NF) secondary to hypoproteinemia after spinal tumor resection.

Methods: We analyzed the clinical data of a patient with hypoproteinemia and described in detail his symptoms, examination results, and diagnosis. We explored the evaluation method of hypoproteinemia in orthopedic patients and its relationship with adverse postoperative outcomes, including the risk of reoperation and rehospitalization, the impact on postoperative wound healing, and the increased probability of wound infection. We also introduced the symptoms of NF and traditional Chinese medicine treatment methods, including debridement and drainage of NF and corresponding nursing measures. These measures involve wound management, anti-infection treatment, psychological nursing, pain management, complication monitoring and treatment, dietary guidance, etc. TCM nursing includes treatment methods such as hip bath and moxibustion.

Results: After careful treatment and nursing, the patient was discharged 36 d after admission.

Conclusions: The nursing experience from this case shows that early diagnosis and comprehensive treatment are essential for NF secondary to hypoproteinemia after resection of a spinal tumor. While evaluating and managing hypoproteinemia, it is essential that the postoperative condition of patients must be closely monitored, any occurrence of complications must be dealt with in time, and effective nursing measures, including TCM treatment methods, must be taken to promote the recovery and good prognosis of patients.

Keywords: hypoproteinemia • necrotizing fasciitis • nursing • resection of spinal tumor • traditional Chinese medicine nursing

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1. Introduction

Hypoproteinemia is typically defined as a plasma albumin level <35 g/L and is the most commonly used assessment of malnutrition in orthopedic patients. Currently, an increasing number of studies have demonstrated that hypoalbuminemia is closely related to the occurrence of adverse outcomes after surgery. The results of a retrospective study showed¹ that patients

with hypoproteinemia were prone to unplanned intubation after surgery, intraoperative or postoperative blood transfusion, postoperative ventilator-assisted ventilation for >48 h, acute renal failure, and even an increased risk of coma and death. In addition, hypoproteinemia can also increase the risk of reoperation and rehospitalization,^{2,3} affect the healing of postoperative incision,

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*Corresponding author.

E-mail: 21193390@qq.com (Y.-F. Zhu).

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lead to the formation of dead space in the incision, and increase the risk of postoperative incision infection.⁴ In recent years, preoperative hypoalbuminemia has been confirmed as an independent risk factor for postoperative incision infection, and it can increase the risk of incision complications after joint replacement by 1.2 times.⁵ However, previous studies have mainly focused on preoperative hypoalbuminemia, and there are relatively few studies on the correlation between postoperative hypoalbuminemia and postoperative complications. Recent domestic studies have suggested that postoperative albumin levels are closely related to incision healing in patients undergoing orthopedic surgery.⁶ In addition, some studies have shown that low albumin levels are also affected by high-sensitivity C-reactive protein (CRP) levels,⁷ which is a hallmark protein produced during the systemic acute inflammatory response.⁸ In cases of sudden acute myocardial infarction, trauma, organ or tissue infection, systemic acute inflammation, lung infiltration by tumor cells and other diseases, CRP levels can increase up to 2000 times the normal level.⁹ In addition, some research institutions have reported that CRP and albumin levels are negatively correlated.¹⁰ Necrotizing fasciitis (NF)¹¹ is a life-threatening disease mainly caused by bacterial infection. Its onset sites are mostly located in subcutaneous tissue and fascia. The typical clinical symptoms are local erythema, surrounding edema, yellow exudation of the wound, and surrounding blisters or bullae. These symptoms are usually accompanied by severe deep pain, systemic fever, and toxic delirium, which can progress to typical signs of shock and ultimately result in death due to multiple organ failure. Although the incidence of NF is low, it is increasing annually with a high mortality rate. Surgical debridement and drainage and the use of broad-spectrum antibiotics are commonly used in clinical treatment, but with the increasing antibiotic resistance of bacteria, and this method can only kill pathogenic bacteria, but can not directly reduce the inflammatory response in the body. The cause of death of NF is precisely due to multiple organ failure caused by inflammation in the body, so the use of antibiotics needs to be strictly controlled. However, TCM treatment mainly focuses on internal and external treatment for holistic adjustment and treatment. Tuoli disinfectant powder¹² is derived from the book *Zhengzong of Surgery*, written by Chen Shigong, a foreign scientist in the Ming Dynasty. It contains the therapeutic thoughts of “tonifying” and “supporting” in traditional Chinese medicine and is a representative prescription for the treatment of “ulcers and ulcers” in traditional Chinese medicine. It is suggested that it has a certain therapeutic effect on NF. In November 2023, a patient with NF secondary to hypoproteinemia after spinal tumor resection was admitted to our department.

After careful treatment and nursing, the patient's condition improved and was discharged 36 d later. Now, the nursing experience is reported as follows.

2. Methods

2.1. General information

The patient was a 50-year-old female with paraplegia after spinal tumor surgery 1 year ago and was bedridden for a long time. One month ago, skin damage occurred in the buttock area, which gradually expanded to the lower limbs, especially the right arm. The patient was admitted to the hospital with the diagnosis of “pressure ulcer and infection.” She denied a history of infectious diseases, chronic diseases, or allergies. The patient complained of numbness in the buttock area, pain in both lower limbs, soft stool, less urine volume, pain when urinating, edema and depression of the dorsum of both feet, general spirit, poor sleep, red tongue with a white and greasy fur, and a slippery pulse. Physical examination showed intermittent fever with the highest temperature of 38.9°C and a rectal temperature of 38.2°C. The patient's pulse was 100 beats/min, and respiration rate was 21 breaths/min. An electrocardiogram showed sinus tachycardia with a mild right axis deviation, suggesting a severe infection. Perianal color Doppler ultrasound showed thickening and edema of subcutaneous tissue in bilateral buttocks and ultrasonographic changes in the left buttock, suggesting abscess formation. Magnetic resonance imaging showed bilateral soft tissue edema in the buttocks, effusion in the left buttock, and pelvic effusion. Laboratory tests: hs-CRP 299.59 mg/L↑, total protein 55.0 g/L↓, albumin 29.4 g/L↓, albumin/globulin 1.15, neutrophil percentage 92.8%↑, neutrophil count $30.76 \times 10^9/L$ ↑, white blood cell $33.14 \times 10^9/L$ ↑, procalcitonin 5.02 ng/ml. Specialized examination revealed that the right buttock was red and swollen, the skin temperature was high, the skin was fester and black, and the pus exudate was seen at the left buttock ulcer. The redness and swelling around the anus and buttock of the patient were expanded, the ulceration was aggravated, and a heavy odor of rot could be smelt. That is, anal abscess was diagnosed by traditional Chinese medicine,¹³ whereas hypoproteinemia and NF were diagnosed by Western medicine. The patient was admitted to the anorectal department for treatment.

2.2. Treatment and outcome

Emergency debridement and drainage of NF was performed. During the operation, the patient was placed in the right lateral posture. After disinfection, a window

was opened at the ulcerated orifice, and the dark red blood could be seen to flow out. The curved forceps were maneuvered to explore the area, and surgical access points were created at each required site. A large number of necrotic fascial tissue could be seen in the abscess cavity, and the abscess cavity was fully scratched. The abscess cavity was rinsed with hydrogen peroxide, metronidazole, sodium chloride, and normal saline. The patient returned to the ward when she felt no discomfort after operation. Clinical anti-infective therapy, gastroprotective therapy, albumin supplementation and other symptomatic and supportive treatments, repeated blood routine tests, hs-CRP, erythrocyte sedimentation rate, procalcitonin and other tests were performed. After defecation, the patient was instructed to take a sitz bath with yinxian lotion, compound Tongye burn oil and compound Huangbai lotion for external use, actively change dressing in the specialist department, closely observe the vital signs and changes of the patient's condition, and reposition the patient frequently. Changes in specific laboratory data are shown in Table 1.

On the first postoperative day, the patient reported numbness in the buttock area, pain in both lower limbs, intermittent fever with a temperature fluctuating around 38°C, a pulse rate of 95 beats/min, and a respiratory rate of 22 breaths/min. Dry insomnia, reduced urine output, red tongue with white, greasy coating, slippery pulse. Specialist examination showed that exudate was seen in the wound dressing, the drainage tube was unblocked, the redness and swelling of the right buttock subsided slightly, the skin temperature was slightly higher and color was red, and the skin ulceration was seen in the perineum. Laboratory tests: hs-CRP 298.91 mg/L↑, neutrophil percentage 91.6%↑, white blood cell $21.81 \times 10^9/L$ ↑, total protein 52.2 g/L↓, albumin 25.9 g/L↓, albumin/globulin ratio 0.98↓, procalcitonin was 3.49 ng/mL↓. The reexamination results of the patient showed that the markers for infection index were slightly better than before, and the albumin levels continued to decrease, so the patient was given white protein self-injection to supplement protein. The antibiotic was changed to moxifloxacin to strengthen the anti-infection treatment. The patient's body temperature was monitored and the dressing was changed daily for

symptomatic and supportive treatment. Close attention was paid to the condition of the incision.

On the third day after the operation, the patient complained of numbness in the buttock area, pain in both lower limbs, she had soft stool, oliguria, dysuria, edema of the dorsum of both feet, depression, general mental status, appetite was good, sleep was good, red tongue, white greasy blindness, and slippery pulse. Physical examination showed a temperature of 37.1°C, a rectal temperature of 37.6°C, a pulse rate of 82 times/min, and a respiratory rate of 20 times/min. The findings showed that high sensitivity CRP 161.75 mg/L↑, neutrophil $11.14 \times 10^9/L$ ↑, hemoglobin 78 g/L↓, mean corpuscular hemoglobin 26.3 pg↓, red blood cell distribution width (CV) 18.1%↑, white blood cell $13.46 \times 10^9/L$ ↑, Total protein was 47 g/L↓, albumin 23.7 g/L↓, albumin/globulin 1.02↓, potassium 2.86 mmol/L↓, and procalcitonin 1.47 ng/mL↓. Specialist examination showed that the wound dressing was stained by exudate, the drainage tube was unblocked, the redness and swelling of the right arm had slightly improved, the skin temperature was higher, and the necrotic tissue was partially exfoliated. The reexamination results of the patient showed that the infection index was significantly improved compared with previous results, and the nutritional status of the patient was poor, indicating moderate anemia, hypoproteinemia, and hypokalemia. The patient was instructed to continue to strengthen nutrition, supplement albumin, potassium, and rehydration.

On the seventh day after the operation, the patient reported improvement that the symptoms were significantly relieved, occasionally had pain and fever, the volume of bowel and urine were normal, the edema of the dorsum of both feet subsided, and the mental state was good, the night sleep was poor, the tongue was red, the fur was white and greasy, and the pulse was slippery. Physical examination showed a temperature of 36.9°C, a rectal temperature of 36.6°C, a pulse rate of 78 times/min, and a respiratory rate of 18 times/min. Magnetic resonance imaging showed that bilateral hip soft tissue edema and pelvic effusion became less severe. Specialist examination showed a little exudate in the wound dressing, an unblocked drainage tube, improvement in

Time	CRP	Albumin	Albumin/globulin	Neutrophilic granulocyte percentage	Platelet count	Procalcitonin
Admission	299.59 mg/L	29.4 g/L	1.15	92.80%	$33.14 \times 10^9/L$	5.02 ng/L
One day after surgery	298.91 mg/L	25.9 g/L	0.98	91.60%	$21.81 \times 10^9/L$	3.49 ng/mL
Three days after surgery	161.75 mg/L	23.7 g/L	1.02	90.30%	$13.46 \times 10^9/L$	1.47 ng/mL

Note: CRP, C-reactive protein.

Table 1. Quantitative results of postoperative laboratory data.

the symptoms of the right buttock, and a slightly higher skin temperature. The results showed that the patient's condition had improved, and the symptoms of the buttock wounds were significantly improved. It was necessary to actively do the rehabilitation treatment for the patient. On postoperative day 36, the patient's wound healed gradually with normal biochemical indexes and was discharged smoothly. Fifty days after the operation, the wound healed after dressing change in the outpatient department.

3. Nursing

3.1. General nursing

3.1.1. Wound management

From the second day after the operation, wound dressing was changed; necrotic tissue, fat, and exudate were completely removed; and repeated washing with hydrogen peroxide, metronidazole, and normal saline was performed. The patient was observed to see whether the pipeline was unobstructed and record the amount, nature and odor of drainage fluid. The perianal and scrotal skin conditions, secretions, and skin temperature of patients were observed and recorded. If there were any abnormal conditions, the doctor was informed promptly, and hyperbaric oxygen treatment was adopted according to the doctor's advice.¹⁴ As an effective physical therapy method to correct hypoxia, the production of hyperbaric oxygen chamber began in 1860,¹⁵ and in 1965, it was reported to be applied to promote wound healing in the Netherlands. The main principle of this treatment is to promote granulation and epithelial growth and reduce anaerobic infections in the perineum by increasing oxygen content in the tissue, accelerating capillary proliferation and helping the establishment of collateral circulation, and inhibiting the growth of anaerobes in the wound. The patient was treated in a single-person oxygen chamber with a pressure of 0.2 MPa once a day for 60 min each time.

3.1.2. Anti-infective therapy

The patient was critically ill with a stench of secretion and required regular ventilation and disinfection. (1) The use of antibiotics: we followed the principle of early, sufficient and combined application, and adjusted the antibiotic use plan in time according to the results of microbial culture and drug sensitivity test. Until the related indicators returned to normal, the use of antibiotics was stopped according to the doctor's advice. (2) Wound environment protection: for postoperative indwelling catheter, attention was paid to the replacement of urine collection

bag and increase water intake to reduce the chance of urinary tract infection, in addition, close observation of catheter drainage and color change; The perineal area should be cleaned every day to ensure that the environment around the wound is dry. We maintained smooth bowel movements to avoid constipation and diarrhea; Care was taken to clean the anus after defecation to prevent contamination caused by fecal residue.

3.1.3. Psychological care

In the early stage, due to the combined effects of physical pathological changes and psychological changes suffered from the changes of the disease, the patient had a low mood such as irritability and anxiety, which was mainly manifested in the swelling and pain of the affected area, the increase of wound exudation, and the pain caused by changing dressings and washing and scratching the necrotic tissue daily. In addition, the fear that the condition could not be effectively controlled, coupled with the feeling of inferiority caused by the wound disfigurement. Therefore, we kept communicating with patients at any time, guided them to treat the disease correctly, building their confidence, and sharing successful cases of cure with them. This will encourage patients to maintain a positive and optimistic attitude, listen to the doctor's instructions, and cooperate with treatment.

3.1.4. Pain management

The infected wounds of patients are extensively involved and require repeated debridement, which is prone to severe pain during the process and should be treated promptly. Studies have shown that effective pain care can better help wound healing.¹⁶ (1) Pain assessment: The analgesic strategy was reasonably adjusted according to the pain numerical rating scale (NRS).¹⁷ When NRS ≥ 6 , analgesic measures were adopted according to the doctor's advice. (2) Medication guidance: According to the WHO three-step principle, non-steroidal anti-inflammatory analgesic parecoxib was used for analgesia, and the patients and their families were informed of the importance of rational use of analgesics. (3) Reduce the pain of dressing change: Before dressing change, use non-steroidal drugs or analgesics to reduce the pain caused by dressing change, choose non-adhesive wound and easy to remove oil gauze to cover, and remove the wound dressing should be as gentle and slow as possible to prevent re-injury to the wound bed. If the dressing was already adherent to the wound, it was removed after thorough infiltration with normal saline.

3.1.5. Monitoring and management of complications

Infection

Studies have shown¹⁸ that septic shock is the most common complication in patients with NF, and its mortality rate is high. Therefore, in the early stages of disease development, in addition to rapid surgical debridement and broad-spectrum antibiotic treatment, it is necessary to strengthen the identification and management of patients with infection symptoms, including monitoring patient consciousness, hemodynamic changes, and evaluation of local wound swelling, fever, and pain. If the skin around the wound is enlarged, hyperpigmented, the exudate increases, accompanied by foul smell, tenderness to palpation, and crepitation, it is considered that the debridement and drainage were not complete, and the doctor should be notified, and re-debridement should be considered.¹⁹

Hypoproteinemia and anemia

NF patients with infection and surgical stress will accelerate the body's catabolism, increase capillary permeability, and easily lead to the loss of albumin and hemoglobin, resulting in hypoproteinemia. In addition, iron absorption in the duodenum and upper jejunum is affected, and the response of bone marrow to erythropoietin is reduced, which aggravates anemia,^{20,21} poor wound healing, and intestinal edema.²² Therefore, nutritional management should be enhanced during treatment. For patients with anal and perineal infection, oral enteral nutrition solution and intravenous nutrition support should be given in the early stage, and semi-liquid diet should be gradually transferred to reduce the frequency of excretion and reduce the contamination of local wounds.²³ Blood routine tests, liver and kidney function and electrolytes should be monitored, and hypoproteinemia and anemia should be corrected in time. It is important to do a good job for fall prevention education to avoid the occurrence of falls.²⁴

Electrolyte disturbance

Infection in patients with NF can lead to extensive thrombosis in local microvessels,²⁵ causing severe microcirculation disorders, accelerated lactate production, and acidosis. This exceeds even that of continuous renal replacement therapy (CRRT), which may also be one of the characteristics of NF complicated with septic shock. In addition, some studies have reported that patients have electrolyte disturbances such as hypokalemia and hypophosphatemia.²⁶ Therefore, during treatment, electrolytes should be actively monitored and

gastrointestinal function should be dynamically evaluated to identify electrolyte disorders and restore enteral nutrition.

Other complications

In addition to the above complications, other organs may also develop cumulative symptoms in the late stage of treatment, such as hepatic encephalopathy, acute kidney injury, and deep vein thrombosis of the lower extremities. The occurrence of these symptoms is not only detrimental to local recovery but may also aggravate the condition. Therefore, it is necessary to strengthen disease monitoring, especially the protection of important organ functions, while treating the original underlying diseases. Early fluid resuscitation was performed with an initial volume of 30 mL/kg of normal saline, aiming for a heart rate of <120 beats/min and a mean arterial pressure of >65 mmHg²⁷ to ensure perfusion of vital organs. During the treatment, the patient's state of consciousness and vital signs were closely monitored, and the intake and output volume were recorded for 24 h. In case of an abnormal situation, the patient was immediately reported to the doctor and cooperated with the doctor for symptomatic treatment.

3.1.6. Dietary guidance

Due to severe trauma, repeated infection, and increased wound exudation, patients have hypoproteinemia, water and electrolyte disorders, and are often in a state of hypermetabolism. Studies have shown that²⁸ the basal metabolic rate is 1.5–2.5 times that of the normal population. The patient's disease burden is further aggravated, and wound healing is seriously hindered. Therefore, a reasonable nutrition plan should be formulated according to the patient's condition to ensure a high-calorie, high-protein, and high-nutrition diet to promote wound healing. High-protein intake can be emphasized in the first week, and a high-protein, high-calorie, and low-residue diet can be taken from the third day after surgery, including chicken breast, fish, beef, dairy products, beans, etc., to strengthen nutrition and enhance body resistance. In the second week, protein was gradually increased, and water-electrolyte balance was monitored. On the seventh day after operation, coarse fiber foods such as fruits and vegetables were added, and the daily water intake was >2000 mL. In the subsequent cycle, the diet was adjusted regularly to adapt to the changes of the condition, and the nutritional status, wound recovery, and physiological indicators were continuously monitored to ensure the comprehensive nutritional support of the patients.

3.2. TCM nursing

3.2.1. Traditional Chinese medicine sitz bath

Studies have shown that necrotic tissues²⁹ can release a variety of enzymes and there are activating factors in a wet environment. Cell proliferation, differentiation, and enzyme activity also require water as a medium, which can cause inflammatory cells to accumulate and accelerate applying debridement. Therefore, hip bathing with traditional Chinese medicine can create a good moist environment for the wound; increase the local skin temperature; facilitate the opening of sweat glands, hair follicles, and sebaceous glands; promote the elimination of inflammatory mediators and metabolites; increase the penetration and absorption of drugs; improve local blood circulation; and accelerate wound healing. At the same time, the results of intervention studies³⁰ show that the total effective rate of bidet therapy is higher than that of conventional therapy. It is believed that sitz bath therapy can significantly improve the blood circulation of the wound site, inhibit the proliferation of bacteria on the wound, and the drug effect is more significant, which can help the wound healing and shorten the healing time. The medicinal liquid used in the treatment program is the Xiangxi Miao and Tujia Ethnic Traditional Chinese Medicine Hospital preparation Yinxian lotion (Approval No. Z20200190000), ingredients: *Lonicera japonica*, *Portulaca oleracea*, *Taraxacum mongolicum*, *Viola philippica*, *Patrinia scabiosifolia*, *Lithospermum erythrorhizon*, *Rheum palmatum*, *Sanguisorba officinalis* charcoal, *Sophora japonica* flower, bran-fried *Atractylodes lancea*, *Sophora flavescens*, processed *Aconitum carmichaelii*, processed *Aconitum kusnezoffii*, *Equisetum hyemale*, *Schizonepeta tenuifolia*, sodium sulfate, alum, *Glycyrrhiza uralensis*. Usage and dosage: Diluted 200 mL yinxian lotion in 1000 mL warm water for hip bath once for 10 min, twice a day. Serious can follow the doctor's advice to directly scrub the affected area with liquid medicine. One week was a course of treatment, and the treatment was given for four consecutive courses.

3.2.2. Moxibustion

Since the patient's sinew injury was located in the buttock area and belonged to the Foot-Taiyang Bladder Meridian, according to the guidance of the theory of acupoint selection along meridians, the acupoints were mainly selected at the non-wound areas of the running meridians, which were divided into main acupoints and matching acupoints. The main acupoints are Zu Tonggu, Shugu, Weizhong, Huiyang, Xialiao, Huiyang, Xialiao, Chengfu, and Zhibian. The secondary acupoints are Zusanli (ST 36) and Quchi (ST 36). The specific operation steps are as follows.

The first step is evaluation: ask the patient's main symptoms and past history, observe the skin condition at the moxibustion site, and make a judgment. The second step is material preparation: treatment tray, moxa stick, lighter, bending tray, treatment towel, screen, etc. The third step is manipulation: moxibustion practitioners wash hands, wear masks, draw curtains to protect the privacy of patients, check the doctor's advice and explain to patients. The moxibustion site was exposed in an appropriate position and covered with a large towel to keep warm. Moxibustion on non-wound surface means that the acupoints were determined according to the specific part of the patient's injury, and mild moxibustion was performed on the corresponding acupoints. The moxa roll was ignited and put into a six-hole moxibustion box. After ensuring that the moxa stick was burned, it was directed at the acupoints, about 2–3 cm away from the skin, and smoked. The operator should ensure that the temperature control of moxibustion is appropriate, ask the patient's feelings in time, adjust the moxibustion distance, avoid scalding the patient, and make the skin feel warm without burning pain during the whole moxibustion process. During the operation, the patient's condition changes were closely observed, and health education was performed to the patients to explain the precautions. Wound moxibustion³¹ is that after moxibustion at meridian acupoints, local wound moxibustion is applied. Moxibustion is performed at about 2–3 cm above the moxibustion site, and moxibustion is performed by repeated rotation. The moving range is 2 cm beyond the wound edge, and the moxibustion time is 30 min. After moxibustion, extinguish the fire of the moxa stick, assist the patient to place a comfortable lying position, open the window for ventilation as appropriate, organize the materials, and make records. Precautions: pay attention to fire prevention during moxibustion, observe and ask patients about their feelings at any time, and strictly prevent the moxa stick from falling off when burning. After the moxibustion treatment, the moxa stick should be extinguished in time. In the process of moxibustion, once the patient has adverse symptoms such as pale complexion, palpitation, nausea, and dizziness, moxibustion should be stopped immediately, the vital signs of the patient should be observed, and symptomatic treatment should be given. After the operation, attention should be paid to the skin at the moxibustion site. If there is flushing and damp heat, it is a normal phenomenon and does not need to be treated. If there are small blisters in the local area, comfort the patient's mood and inform that they can be absorbed naturally. If the blister is too large, the patient's mood is appeased, and the water solution is extracted with an injection needle. After disinfection, the blister is covered with sterile dressing.

4. Conclusions

Studies have shown that hypoalbuminemia is closely related to poor postoperative outcomes, and patients may face a series of complications, including unplanned intubation, blood transfusion, prolonged mechanical ventilation, and acute renal failure. At the same time, hypoproteinemia may also increase the risk of reoperation and re-hospitalization, affect the healing of postoperative incision, and even lead to incision infection.

Although preoperative hypoalbuminemia has been confirmed to be an independent risk factor for incision infection after surgery, there are relatively few studies on the correlation between postoperative hypoalbuminemia and complications, especially in patients undergoing orthopedic surgery. In addition, although the incidence of NF is low, the mortality rate is high, especially in the early stage of admission, the patient had

very high infection indicators, such as high-sensitivity CRP. The treatment is mainly surgical debridement and drainage and antibiotics, and traditional Chinese medicine treatment such as Tori disinfectant powder is also considered effective. Multidisciplinary collaboration played a key role in the care of this patient. Overall, the patient's treatment process involved multiple aspects, including comprehensive nursing, TCM nursing, and scientific medical means. Finally, with the joint efforts of the team, the patient successfully recovered and was discharged from the hospital.

Ethical approval

Ethical issues are not involved in this paper.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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