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Treatment of Complex and Severe Pressure Sore with Perineal Necrotizing Fasciitis by Flushing Negative Pressure: A Report of 12 Cases

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Abstract

Objective: To investigate the efficacy of flushing negative pressure in the treatment of complex and severe pressure ulcers complicated with perineal necrotizing fasciitis.

Methods: A total of 12 patients with complex and severe pressure ulcers complicated with perineal necrotizing fasciitis were given comprehensive treatment such as anti-infection and anti-shock. After the condition was relatively stable, the wounds were treated with washing negative pressure and other minimally invasive treatment. Results: Among the 12 patients, 1 died of multiple organ failure due to sepsis, and the rest were cured successfully with wound healing.

Conclusion: The clinical incidence and cure rate of complex and severe pressure sore complicated with perineal necrotizing synovitis are low. Such patients progress rapidly and have poor prognosis. The method of flushing negative pressure can reduce iatrogenic trauma, alleviate the pain of patients and improve the cure rate. This method is simple and easy to operate, and has high academic value and clinical significance.

Keywords: Flushing negative pressure; Severe pressure sores; Necrotizing fasciitis

Introduction

Pressure ulcer is a common complication of elderly patients. In recent years, with the increase of paraplegia after trauma caused by traffic accidents, the pressure ulcer in the young is also increasing year by year. The clinical incidence of necrotizing fasciitis is low, and pressure sore complicated with perineal necrotizing fasciitis is even rare. There is a lack of mature and effective treatment in clinic. Once the patient has pressure sores, usually cannot find a suitable medical institution, most of them "change their dressing" at home. Due to the limitations in environment and technique, the wound infection is almost inevitable. Pressure ulcers complicated with necrotizing perineal fasciitis will make the patients in very complicated and dangerous situation. Any invasive treatment with great irritation is not applicable to such patients. Twelve patients with complex and severe pressure ulcers complicated with perineal necrotizing fasciitis were mainly treated with flushing negative pressure. The results show that this method can reduce iatrogenic trauma, alleviate the pain of patients and effectively improve the cure rate.

Basic Information

From March 2014 to March 2019, 12 cases of complicated and severe pressure ulcers with necrotizing perineal fasciitis were admitted and treated in our hospital. This group includes 8 males and 4 females (33.3%), the age ranges from 41 to 72 with the average of 54. The history of pressure ulcer ranges from 34 days to 14 years. Among them, 11 patients had stage 4 pressure sores at the ischial tuberosity (91.7%), 1 patient had stage 4 pressure sores at the left hip, and 5 patients (41.7%) had multiple pressure sores (Bilateral ischial nodular sinus pressure sore and sacral stage 4 pressure sore). Of the 11 patients with stage 4 pressure sores at the ischial nodules combined with perineal necrotizing fasciitis, 8 patients had paraplegia caused by trauma, accounting for 72.7% (8/11), and 3 patients were paralyzed by spinal cord neuritis. Three patients were complicated with diabetes. Except for 3 cases without obvious shock symptoms, the other 9 patients developed septic shock in varying degrees (75.0%). There were 4 patients with positive peripheral blood bacterial culture, accounting for 33.3% (4/12) and 44.4% (4/9) of septic shock patients. Among them, 1 case was Gram-positive cocci (Staphylococcus aureus), accounting for 25% (1/4), and the other 3 cases were Gram-negative bacteria (2 cases of Escherichia coli and 1 case of Pseudomonas aeruginosa). The culture results of bedsore secretions are shown in Table 1.

Treatment and Results

After admission, all the 12 patients were treated with anti-infection, anti-shock, nutritional support, symptomatic treatment and so on. Except for 1 case of multiple organ failure caused by sepsis, who died after 8 days of rescue, the other 11 cases were treated successfully. Through the comprehensive treatment of internal medicine, after the patient's condition is stable, and then carry out the treatment for the wound. One patient underwent small incision colostomy because of defecation and repeated contamination of the wound. After the initial stage of appropriate expansion, 11 patients were mainly treated by

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Figure 1: A Sinus duct pressure ulcer at bilateral ischial tuberosity accompanied by necrotizing fasciitis in pudendal area; B Wound condition of complicated perineal necrotizing fasciitis; C An emergent scrotal incision. Note the dark necrotic color of the scrotal fascia.

Figure 2: The wound of stage 4 pressure sore at the right ischial tubercle; B-C Necrotizing fasciitis of the perineum; D Indwelling flushing tube in the sinus cavity, and negative pressure drainage was performed; E-F After the two wound surfaces being cleaned, stretch operation was performed to close the wound surfaces, and wound healing was finally achieved.

Figure 3: A-B wound condition of the left sciatic tubercle 4 stage pressure ulcers and perineal necrotizing fasciitis; C sinus cavity indwelling flushing and negative pressure drainage; D the wounds were closed by stretch operation after the wounds being cleaned; E-F the healing of the wound.

flushing negative pressure and other minimally invasive methods, and all the wounds healed. Among the 11 patients, the shortest course of treatment was 47 days, the longest was 129 days, with an average of 81 days.

Discussion

Pressure ulcers mostly happen to elderly patients, who usually have complex basic conditions. Malnutrition, low immunity, multiple organ dysfunction, are their common characteristics, which determines that the patients have limited tolerance to large invasive surgery.

Major traumatic surgery may cure pressure sores at one time, but patients still have to stay in bed or sit in a wheelchair, it is entirely possible to produce new pressure sores, that is, secondary pressure injury or repeated injury, which is not uncommon in clinic. The recurrence rate of pressure ulcers was 42.4% two years after treatment [1], far exceeding people's estimates.

Due to the body position, the sinus pressure sore orifices in the ischial tubercle are often closed, the secretion is not easy to discharge, often complicated with anaerobes infection, and the infection spreads easily along the muscle space. Because the gluteus maximus is located on the lateral superior side of pressure sores at the ischial tubercle, toxins tend to spread to the medial anterior fascia, where the muscle is relatively weak. Perineum is mostly composed by loose connective tissue with poor blood supply, which is prone to be complicated with necrotizing fasciitis after bacterial infection. Perianal necrotizing fasciitis is characterized by perianal and perineal fascia necrosis, as shown in Figure 1. Once it occurs, the disease progresses rapidly,

Table 1: Results of bacterial culture of bedsore secretion (12 cases).

Pathogenic bacteria	Case Number	Percentage (%)
E. coli	3	25.00%
Staphylococcus aureus	3	25.00%
Proteus mirabilis	2	16.70%
Common proteus	1	8.30%
Pseudomonas aeruginosa		
Klebsiella pneumoniae		
Acinetobacter lwoffii		

The percentage of Gram-positive cocci in bedsore secretions was 25.0% (3/12), which was consistent with the results of peripheral blood culture.

often accompanied by septic shock and death [2]. Among the patients in this group, 9 cases developed septic shock, the incidence rate was 44.4%. The results of bacterial culture in peripheral blood of 4 patients were positive, of which 1 case was Gram-positive cocci, accounting for 25%, which was consistent with the culture results of bedsore secretions. 1 case died of multiple organ failure due to septic shock. The mortality rate was 25% (1/4). Although paraplegic patients caused by trauma account for only 13.9% of pressure sore patients [3], however, this kind of patients are relatively young and have higher life expectations, wheel chairs are these main transportation and have relatively wide range of activities. In this group, 72.7% (8/11) of the pressure sore wounds were located at the ischial tubercle, of which 91.7% (11/12) were complicated with perineal necrotizing fasciitis. Therefore, the sinus pressure sore in the ischial tubercle will be the key points and difficulties in the prevention and treatment of pressure sore in the future.

The perianal and perineal area has complex anatomical structures with important organs closely adjacent, the scope of operation is vague and the expectation of operation is limited, and the infection has led to various damage to the tissues and organs, improper expansion to the wound may lead to serious consequences [1]. Although all wounds were cured, 3 of the 8 male patients had permanent destruction of the urethra (37.5%, 3/8). As the male urinary tract is long and superficial, when the perineal necrotizing fasciitis occurs, it often leads to urethral damage once it is expanded improperly. This is a very serious situation and should be highly vigilant and valued, as shown in Figure 2.

The surface of pressure sore was treated with PU sponge material provided by Shanghai iL-Sino CO., LTD., indwelling flushing tube in sinus cavity for flushing negative pressure drainage [4,5]. Enclosed Negative Pressure Drainage (ENPD) is the main method for the treatment of chronic wounds such as pressure sore. Its main function is to clean the wound and improve the microcirculation [6]. The flushing negative pressure is based on the dissolution and dilution principle of bath therapy to clean the wound [7]. When the sterile isotonic solution enters the sinus cavity of pressure sore, the bacteria, liquefied dead tissue, purulent secretions and other harmful substances in the sinus cavity are dissolved in aqueous solution, and are actively discharged out of the body by negative pressure. Through continuous washing and drainage, the harmful substances gathered in the sinus cavity are completely removed, thus removing the unfavorable factors hindering the healing of pressure sore, improving the healing environment of the wound and clearing the obstacle for the final cure of pressure sore. Irrigation and negative pressure drainage is an ideal minimally invasive treatment for patients with small injury. When the wound is not large, there is generally no need to close the wound through invasive surgery [1], as shown in Figure 3.

The washing solution is iodized saline (normal saline 500ml + iodophor 10ml, twice a day) [1]. None of the 12 patients were treated with traditional skin flap. The trauma was small and the cure rate was 91.7% (11/12), the function of the patient is protected to the maximum extent. The average course of treatment was only 81 days.

Conclusion

Although the incidence of complex and severe pressure ulcers complicated with perineal necrotizing fasciitis is low, such patients often progress rapidly, which can easily lead to septic shock and even death. Pressure sores at the ischial tubercle are prone to induce perineal necrotizing fasciitis. A considerable number of male patients will have permanent urethral damage once perineal necrotizing fasciitis occurs. Complex and severe pressure sore itself is quite difficult to treat, and the treatment get more difficult when it is complicated with perineal necrotizing fasciitis. The minimally invasive treatment of irrigation and negative pressure drainage has the advantages of less injury, good tolerance and ideal therapeutic effect, which opens up a new way for the effective treatment of this kind of patients, and is worthy of clinical application.

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