VSD CLINICAL EFFICACY FOR ORTHOPEDIC TRAUMA INFECTION

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ABSTRACT

Development and application of VSD orthopedic treatment technology has brought good news for orthopedic trauma infection patients. But some medical personnel are not very clear about the clinical effectiveness of the technology. To further explore the actual clinical effect of VSD treatment in orthopedic trauma treatment, this paper retrospectively analyzed 3248 patients who received orthopedic trauma treatment in major hospitals from March 2014 to October 2015 as research subjects, randomly divided them into treatment group with 1986 cases (VSD treatment), and control group with 1262 cases (conventional drainage treatment) according to their treatment methods. After a retrospective analysis of medical records of all patients, it was found that the therapeutic effect of treatment group patients was significantly higher than that of control group patients, with statistically significant differences <0.05. Thus, the results of this study further confirm that VSD treatment can effectively reduce the probability of infection and other complications of orthopedic patients during treatment.

Key words: VSD technology; orthopedic treatment; wound infection; factor; countermeasure.

Introduction

There are diverse causes of orthopedic trauma diseases. For instance, after undergoing tremendous physical shock and injury, people are prone to orthopedic trauma. Or, increasing age results in continual loss of calcium inside the bones, which leads to fragile bone structures and increases the probability of disease occurrence. Orthopedic trauma disease not only causes severe damage to the limb sensory and motor ability of patients, but also has a greater risk of infection and complications, causing a serious impact on patient’s wound healing. In recent years, through clinical studies, Li Jianfei, Kong Xiaohui, Shi Baoguo et al. effectively confirmed the effectiveness of VSD therapy for orthopedic trauma disease(1-3), but the therapeutic range is too small.

To further support this perspective, this paper studied 3248 cases of patients as research objects to further explore the clinical effect of VSD treatment.

Methods

General Information

This paper randomly selected 3248 cases of orthopedic trauma patients who received treatment in major hospitals from March 2014 to October 2015 as research objects. There were 2013 male patients and 1235 female patients, aged 21-72 years, with mean age 46.9 ± 11.7 years; all objects had varying degrees of orthopedic trauma, including 1,231 cases of old trauma and the remaining 2017 cases of fresh trauma; 1856 patients had upper extremity trauma, and the remaining 1392 cases had lower extremity trauma; patients were divided into treatment and control group according to selected treatment method during hospitalization, 1986 cases, 1262 cases respectively.
We compared age, condition, sex and other characteristics of the two groups of patients, and there was no significant difference, \( P > 0.05 \), comparable. The upper extremity orthopedic trauma is shown in Figure 1. The common orthopedic lower extremity trauma is shown in Figure 2.

**Treatment method**

Control group: By analyzing medical records of patients, the control group patients were treated by conventional drainage therapy. During treatment, appropriate dosage was reasonably determined based on trauma area, with drugs replaced every 1-2 days. If the area of orthopedic trauma was large, drainage prevention was needed, plus the use of antibiotic drugs. For real-time monitoring of therapeutic effect, the pathogen was detected once a week or so. After the wound surface recovered well, and granulation gradually grew, the wound was sutured\(^8\); if recovery of the wound surface was poor, and granulation growth was not optimistic, transfer of skin flap was carried out to prevent deterioration of the infected part\(^9\).

Treatment Group. In this study, VSD therapy was adopted for the treatment group patients. VSD refers to negative pressure sealing drainage surgery. Before treatment, medical personnel conducted meticulous debridement, complete VSD surface coverage. By analyzing medical records, 922 patients in the treatment group had a relatively deep wound surface. Therefore, medical personnel provided bottom wound filling treatment with VSD surface application, until all cavity positions were filled. Translucent film was applied to complete closure of the wound surface; at the same time, surface absorption was applied with negative pressure standard, controlled between 125-450mmHg\(^8\)\(^7\). After completion of this phase of treatment, the wound surface was meticulously washed with sensitive antibiotics to avoid bacterial infection. One week after surgery, the dressing was removed and pathogen detection was performed. If the test results indicated that granulation growth was good, suturing was carried out. If granulation growth was poor, the VSD dressing was refilled\(^8\), and repair treatment after granulation growth was good.

**Comparison of methods**

By analyzing clinical history data, the treatment effect in the two groups was evaluated. The treatment evaluation method was as follows:

- **Invalid**: orthopedic trauma face did not get any better or even deteriorated.
- **Markedly**: area of orthopedic trauma was significantly reduced, after the surgery is completed, fresh granulation grows well with significant effect.
- **Healed**: After treatment end, the trauma recovered well and healed.

Effective rate = \( \frac{\text{healed} + \text{markedly}}{\text{total number}} \times 100\% \).

**Statistical method**

For the study of VSD effectiveness SPSS19.0 statistical software was used for analysis and data processing, with count data represented in \((n,\%)\). Chi-square test was adopted; when \( P < 0.05 \), it indicated statistically significant difference.
Results

The therapeutic effect of treatment group patients was obvious. First, seen from recovery time of the wound area, 994 patients out of all 1986 cases in the treatment group significantly improved within one week; 754 patients had marked improvement within 2 weeks, while the remaining 238 patients began gradual improvement 3 weeks after receiving treatment; but in the 1262 patients in the control group, only 302 cases completed rehabilitation therapy within a week, and 252 patients completed rehabilitation treatment within 2 weeks. The remaining 708 patients began to improve 3 weeks after treatment. It can be seen that the differences between groups P<0.05, was statistically significant.

Comparing the postoperative treatment effect, VSD therapy effectiveness reached 99.2%, trauma and infection area of 1,972 cases of patients gradually reduced after the treatment cycle.

Treatment efficiency of conventional drainage treatment was only 76.2%, with only 962 patients improving gradually after completion of the treatment cycle. All the remaining 300 patients had different degrees of infection, trauma relapse, complication and other issues.

Discussion

With the continuous progress and development of modern medicine, categories of various diseases are more specific. During surgical treatment, drainage has played an important role, but the safety and effectiveness of drainage has not received one hundred percent recognition and affirmation. While completing treatment for patients and saving life and health, drainage treatment has a greater risk of postoperative complications and infections. To effectively address this issue, relevant medical staff make continuous efforts to improve clinical treatment of drainage. After constant attempts and study by the work team, Professor Qiu Huade conducted a comprehensive improvement of traditional drainage, put forward new drainage treatment technology - vacuum sealing drainage (VSD). The VSD vacuum drainage technology device is shown in Figure 3.

Design thinking of the new drainage technique is unique, reasonable and practical, which offers significant improvements on traditional surgical drainage methods.
Compared to traditional drainage technology, VSD drainage technology is more comprehensive, can comprehensively take away bacteria culture medium and toxicity decomposition products of damaged tissue after trauma, reduce multiple absorption of toxic products, and thereby block the pathological response chain. Semipermeable membrane used in VSD technology can effectively prevent entry of external bacteria, so that internal growth is in an absolutely hygienic environment and rapid wound closure can be achieved. This technique can also guarantee normal breathable conditions in the wound and the skin around the wound. Negative pressure can provide power for active drainage, maintain normal blood circulation of the wound surface and provide a good guarantee for growth of the bud tissue.

The most prominent feature of VSD technology is that it can have all-round contact with the wound surface, effectively avoid insufficient drainage of spot contact with wound surface in conventional drainage techniques, no accumulation of exudates, ensure thorough drainage of the whole wound surface. At the same time, the technology is simple to operate. Wrapped in PVA foam, the multi-side hole drainage tube will not easily have poor drainage problems of tube plugging. Under negative pressure suction effect, necrotic tissue of the wound surface will gradually appear in a liquefied state, edema will gradually be exuded, while other metabolites will be cleared in a short time. VSD technology can be used continuously for one to two weeks, which effectively avoids the pain of dressing changes and care difficulties in conventional drainage surgery, saves the use of antibiotics, shortens hospital stays, reduces comprehensive medical cost, and provides patients with more convenience.

In summary, VSD treatment of orthopedic trauma offers significant effect, which can effectively prevent postoperative infections and the occurrence of other complications, and is therefore worthy of being popularized in clinical applications to help more orthopedic trauma patients reduce pain at an early date.

References


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