SECONDARY SUTURE IN COMPLICATION MANAGEMENT OF SUBCUTANEOUS SURGICAL SITE INFECTIONS AFTER COLORECTAL SURGERY: A PROSPECTIVE CASE SERIES USING NPWT WITH A PHMB GAUZE SYSTEM

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Introduction
In our prospective case series, subcutaneous infections after median laparotomy for colorectal surgery were treated by NPWT with a PHMB gauze system and finally closed by secondary sutures. Our hypothesis was that NPWT provides shorter treatment time, minimal pain sensation, and lower total treatment costs when compared to standard treatment (moist-to-dry) dressing with gauze plus 0.04% PHMB solution. The study was approved by the ethics committee of the medical board, federal state of Baden-Württemberg.

Study Protocol
- Diagnosis of subcutaneous wound infection and exclusion of fascia dehiscence
- Opening of wound, microbiological swabs and debridement
- NPWT* was applied on wounds with PHMB gauze interface**, a round silicon drain and transparent film dressing was placed on NPWT* system was maintained under suction with ~200 mmHg using a portable NPWT device.
- NPWT* was applied continuously and dressings were changed every 2–4 days. NPWT* continued until wounds were clean and free of infection.
- Secondary sutures under local anesthesia plus subcutaneous drainage without suction.
- Removal of stitches after 14 days and control of healing after 8 weeks.
- None of the patients presented with contraindications:
  - Malignancy of the wound
  - Uncontrolled coagulopathy or malnutrition
  - Non-eritic and unexplored fistula
- The NPWT dressing system was not placed over exposed blood vessels or organs.

Results
16 patients (4 female, 12 male, age 46–83 years, ASA 1–4) after median laparotomy were included. All patients voluntarily participated and signed a consent form, no patient rejected, released or dropped out during therapy. Validating our patients data by comparison with the literature showed evidence of conformity. Our patients fit into the "normal" class of patients for colon surgery. The mean age of patients undergoing colon surgery in the literature is given as 68 years. In our study we calculated the mean patient's age as 68.4 years (standard deviation STD = 6.7 years, range 47–83 years). The mean BMI was calculated as 26.3 (STD = 4.7).

After diagnosis of surgical site infection (SSI), the wounds were opened by removing stitches after 14 days and control of healing after 8 weeks. Advanced wound treatment was needed in normal hospital practice. This would lead to lower total treatment costs.

Compared to standard wet-to-dry gauze dressings with PHMB solution, the NPWT treatment provides an inexpensive method for lowering total treatment costs. PHMB gauze under NPWT proved to be a powerful system for treating SSI, provided a comfortable dressing that was not tied to be in a 'minimal pain level range' during dressing changes, and lowered overall treatment time and costs. Finally, our NPWT system 3 x 3 protocol is recommended for subcutaneous infections of median laparotomies after abdominal surgery and has since become a standard treatment for SSI in our hospital.

Table 1: Time intervals and costs

<table>
<thead>
<tr>
<th>Procedure or Feature</th>
<th>Time (days)</th>
<th>Cost (US$)</th>
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</thead>
<tbody>
<tr>
<td>Inpatient stay</td>
<td>14</td>
<td>8,384.39</td>
</tr>
<tr>
<td>Wound treatment</td>
<td>47.3</td>
<td>1,458.70</td>
</tr>
<tr>
<td>Dressing changes</td>
<td>26</td>
<td>46.20</td>
</tr>
<tr>
<td>Total treatment time</td>
<td>73.3</td>
<td>9,997.29</td>
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</tbody>
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NPWT: Negative Pressure Wound Therapy
PHMB: Polyhexanide
VAS: Visual Analogue Scale
STD: Standard Deviation

Conclusion
All patients were satisfied with the treatment and NPWT results. In the second group, a healing rate of almost 80% could be achieved using subcutaneous dressings with a suction protocol 3 days after secondary sutures. Compared to standard wet-to-dry gauze dressings with PHMB solution, the NPWT treatment provides an inexpensive method for lowering total treatment costs. PHMB gauze under NPWT proved to be a powerful system for treating SSI, provided a comfortable dressing that was not tied to be in a 'minimal pain level range' during dressing changes, and lowered overall treatment time and costs. Finally, our NPWT system 3 x 3 protocol is recommended for subcutaneous infections of median laparotomies after abdominal surgery and has since become a standard treatment for SSI in our hospital.

Notes

References

Presented at the 27th Annual Symposium on Advanced Wound Care and Wound Healing Society (SAWC/WHS), April 23–27, 2014, Orlando, FL, USA

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