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Original research

Vacuum-assisted closure therapy for infected perineal wounds after abdominoperineal resection. A retrospective cohort study

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HIGHLIGHTS

- 33% of patients with a major perineal wound infection after abdominoperineal resection is treated with VAC therapy.
- Time to wound healing did not statistically differ between patients treated with or without VAC therapy.
- All patients treated with VAC therapy had a healed perineal wound at approximately one year after surgery.

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ABSTRACT

Introduction: Perineal wound complications are a main problem after abdominoperineal resection (APR). There is little evidence concerning perineal wound management. This study describes and evaluates the role of vacuum-assisted closure (VAC) therapy in wound management strategies of perineal wound infections after APR.

Methods: Patients undergoing APR for malignant disease between January 2007 and January 2013 were identified retrospectively. Data regarding occurrence and management of perineal wound complications were collected. Perineal wound infections were classified into minor or major complications and time to wound healing was measured. Time to wound healing was compared between patients receiving routine care or with additional VAC therapy.

Results: Of 171 included patients, 76 (44.4%) had minor and 36 (21.1%) major perineal wound infections. Management of major infected perineal wounds consisted of drainage (n = 16), debridement (n = 4), drainage combined with debridement (n = 4), VAC therapy alone (n = 5), or VAC therapy combined with other treatments (n = 7). Median duration of perineal wound healing in major infected wounds was 141 days (range 17–739). Median time to wound healing was not different in patients treated with (172 days, range 23–368) or without VAC therapy (131 days, range 17–739).

Discussion and conclusion: In this study, VAC therapy did not shorten time to wound healing. However, prospective studies are required to investigate the role of VAC therapy in management of infected perineal wounds after APR. Up to then, wound management will remain to be based on clinical perception and 'gut-feeling'.

1. Introduction

Colorectal cancer is the third most commonly diagnosed cancer worldwide for which surgery is still the cornerstone of treatment [1]. A third of resectable patients will undergo an abdominoperineal resection (APR) [2]. Unfortunately, morbidity rates after APR remain high [3], thereby increasing hospital stay and costs. Besides in-hospital disadvantages, morbidity after APR may also affect quality of life [4] and oncologic outcomes since in case of metastatic disease, further treatment may be delayed. The most common complications after APR include perineal wound complications, urinary and sexual dysfunction [5,6]. Perineal wound complications are reported in up to 80% of patients [7–11] and include perineal hemorrhages, perineal wound infections,

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perineal wound dehiscences, pelvic abscesses, perineal fistulas, and perineal herniations. A cause for this high prevalence could be the large dead space cavity remaining after surgery in which fluids accumulate that form a source of infection [10].

Management of infected wounds primarily consists of debridement, irrigation and application of wound dressings [12,13]. For minor infected perineal wounds, treatment consensus exists, while for larger infected perineal wounds treatment tends to differ depending on the treating surgeons' preferences. Nevertheless, several strategies for treatment of major wound infections have been described, of which frequent debridements, incision followed by drainage, (local) antibiotics and muscle flap reconstruction are the most predominant. However, neither of these treatments has been evaluated formally for complex infected perineal wounds after APR, except for muscle flap reconstruction [14,15]. More recently, VAC therapy is used more often, but sufficient evidence still lacks for this treatment approach. While the benefit of vacuum-assisted closure (VAC) therapy has been established for diabetic foot wounds, chronic leg ulcers, skin grafts for burns and post-operative wound infections after trauma or vascular surgery [16–20], VAC therapy for complex perineal wounds has yet only been described in case studies in which it showed promising results [21,22]. Therefore nowadays, therapeutic decision-making still depends on clinical perception and 'gut-feeling'.

As a consequence of a lack of evidence regarding the use of VAC therapy in perineal wound infections, this study aims to describe and evaluate the role of VAC therapy in wound management strategies of major infected perineal wounds in patients undergoing APR for malignant disease.

2. Patients and methods

All patients undergoing APR for malignant disease between January 1st 2007 and January 1st 2013 at a tertiary and two Dutch teaching-hospitals (University Medical Centre Utrecht (UMCU), Diakonessenhuis Utrecht, and Meander Medical Centre Amersfoort respectively) were eligible for inclusion. The Medical Ethical Committee of the UMCU granted permission for this study.

Patient characteristics were collected retrospectively from clinical records, pathology reports and operative reports. Comorbidity was scored using the age adjusted Charlson Comorbidity Index and the International Classification of Diseases for diagnosis coding [23–25]. Tumors within 5.0 cm from the anal verge on magnetic resonance imaging (MRI), computed tomography (CT), endoscopy or digital examination were classified as low, and mid-rectal tumors if between 5.0 and <10.0 cm. Preoperative therapy was delivered according to Dutch guidelines and consisted of short-course radiotherapy (5 × 5 Gray) or chemoradiation (25 × 2 Gray with concomitant capecitabine) [26]. APR was performed according to the total mesorectal excision principle [27]. The pelvic floor musculature, subcutaneous fat and skin were approximated, a drain was left in the pelvic space according to surgeon's preferences and an omentoplasty was done when possible. The Clavien-Dindo classification was used to grade surgical complications other than perineal wound complications [28]. Grade I and II were considered minor complications, while grade III-V were classified as major complications.

2.1. Outcome measurements

Perineal wound complications include infections, hemorrhages, fistulas and herniations. Infections were scored if (outpatient) clinical records or post-operative clinical letters reported any note suggesting that the perineal wound was not clean, had to be opened, or dehiscented spontaneously. All dehiscences were also scored as infections because of the difficulty to differentiate. A fistula was defined as a connection between the perineum and the urethra, bladder, vagina, intestine or presacral cavity. All fistulas were scored as an infection as well. Perineal wound infections were categorized in minor and major complications. Wound infections were considered minor if treatment with wound dressings, irrigation and/or (local) antibiotics was sufficient. In case more intensive therapy was needed, with or without anesthesia, wound infections were considered major complications. The different therapies for major infected wounds were described and time to wound healing was measured in days, from the date of surgery to the last reported date of an open wound. Subsequently, outcomes were divided into 4 categories: healed within 1 month, healed within 3 months, healed within 6 months or healed within 12 months. For patients with an open wound at the end of follow up, time to wound healing was measured in days from the date of surgery to the date of last follow up and these were treated as censored observations.

2.2. Statistics

Statistical analysis was performed with SPSS statistical software (SPSS Statistics Version 20.0, Inc., Chicago, Illinois, USA). Patient characteristics are presented as median with range, categorical data as number of patients and percentage of group. Group differences were tested using the independent two samples t-test within normal distributed data and the Mann–Whitney–U test within non-normal distributed data. Normality was tested by the Kolmogorov–Smirnov test. The chi-square test and Fisher exact test were used to compare percentages between groups. In addition, time to wound healing is presented in a Kaplan–Meier plot. Differences between curves were tested by the log rank test. P values of <0.05 were considered significant.

3. Results

3.1. Patients

During the study period 171 patients were included. Characteristics of patients are depicted in Table 1, divided between minor and major wound complication groups. The indication for surgery was rectal adenocarcinoma in 168 (98%) patients, two patients had anal squamous cell carcinoma and one patient a gastrointestinal stroma tumor of the rectum.

3.2. Wound complications

Fig. 1 presents a specification of perineal wound complications. The most common perineal complication was a wound infection (n = 112; 94% of perineal complications). Of these 112 patients, 76 (68%) had a minor perineal wound infection and 36 (32%) patients a major perineal wound infection. Median time to perineal wound healing in all patients was 30 days (range 0–739). Patients with a minor perineal wound infection had an open wound for a median of 63 days (range 4–549) compared to 141 days (range 17–739) in patients with a major perineal wound infection. Other wound complications consisted of perineal herniation in 10 (6%) patients after a median of 317 days (range 91–1073). Six (60%) of 10 perineal herniations were treated conservatively and 4 (40%) were surgically repaired. A total of 8 (5%) patients developed a fistula. Two fistula originated from the vagina (25%), two (25%) from the small intestine, two (25%) from the presacral cavity, one (13%) from the urethra and one (13%) from the bladder.