Vacuum assisted closure system in the management of cervical anastomotic leakage after gastric pull-up

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Abstract

We propose the use of the vacuum assisted closure (VAC) system for the management of cervical anastomotic leakage after esophagectomy and reconstruction by gastric pull-up. The VAC system converts the open cervical wound into a controlled closed wound with major advantages: No need of a nasogastric tube for decompression, no need of a nasoenteric tube for feeding because of the possibility to maintain a semisolid oral diet and no need of frequent daily changes of dressings.

Keywords: Esophagectomy; Gastric pull-up; Cervical anastomotic leakage; Vacuum assisted closure system

1. Introduction

Following esophagectomy reconstruction with a gastric tube and cervical esophagogastrostomy remains the method of choice [1]. Though patients with cervical anastomotic leakages are generally not as ill as those with thoracic ones, anastomotic dehiscence is a dreaded complication of esophagectomy. Although death from an anastomotic leak that is truly confined to the neck is infrequent [2], leaks from cervical anastomoses that have descended into the mediastinum are associated with significant mortality [3]. Overall approximately 20% of patients with clinically apparent cervical anastomotic leaks die [4].

The treatment of clinically apparent cervical anastomotic leakage consists of opening the cervical incision, thus establishing an adequate drainage. Frequent daily changes of dressings and decompression of the stomach by a nasogastric tube are applied in order to minimize the spilling of gastric contents into the wound. Throughout the healing period that may even take several weeks [4] feeding has to be done by a nasoenteric tube.

The vacuum-assisted closure (VAC) system was first introduced by Argenta and Morykwas in 1997 for the treatment of pressure ulcers and other chronic wounds [5,6]. Since then, the number of indications for the VAC system steadily increased. The principle of this device is based on a uniform negative pressure applied to the wound, resulting in arteriolar dilation which promotes the formation of granulative tissue [5,7,8].

We investigated the feasibility of a VAC-system treatment for clinically apparent cervical esophago-gastric anastomotic leakage of different sizes.

2. Patients and methods

2.1. Patients

Three patients with cervical anastomotic dehiscence following esophagectomy and retrosternal gastric tube reconstruction entered the study.

2.2. Device

The VAC system (KCI Inc., San Antonio, TX, USA) consists of an open-cell polyurethane ether foam dressing (sponge) with a pore size ranging from 400 to 600 μm. An evacuation tube that communicates with the reticulated foam is embedded in the latter, thus ensuring equal distribution of the applied negative pressure to all spaces.
within the system. The sponge is fashioned to the specific wound geometry and placed into the wound. The wound site is then covered with an adhesive drape, thereby converting an open wound into a controlled closed wound. The evacuation tube is connected to a canister where the wound fluid is collected, and the latter is connected to the adjustable vacuum pump, by which a negative pressure between 25 and 200 mmHg can be maintained.

2.3. Surgical technique

In case of clinically apparent cervical anastomotic dehiscence after esophagectomy and reconstruction with retrosternal gastric interposition partial reopening of the cervical incision was done followed by debridement of necrotic tissue. Thereafter, the skin surrounding the cervical incision was protected using a hydrocolloid dressing (Suprasorb®H, Lohmann & Rauscher International GmbH, 56579 Rengsdorf, Germany) (Fig. 1).

In order to protect the anastomotic region from direct contact with the VAC foam a small patch of soft silicon wound contact layer, with selective micro-adherence (Mepitel® safetac, Mölnlycke Health Care AB, 40252 Göteborg, Sweden) was put over the anastomotic leak (Fig. 1). A small part of the mini VAC foam was fashioned to the specific wound geometry and placed into the wound. The larger part of the VAC foam was positioned directly over the cervical incision (Fig. 2) with the surrounding skin protected from suction as mentioned above. The VAC-foam was covered with an adhesive drape, which was fixed to the healthy skin at the neck and the supraclavicular region. A continuous suction between 50 and 100 mmHg depending on the extent of the leakage and the depth of the wound was installed. In the first 2–4 days, the VAC system was changed every 24 h. When granulative tissue had begun to form (Fig. 1) the intervals were lengthened accordingly up to 72 h depending on the amount of gastric fluid and wound secretion drained over the system.

In all patients, the change of the VAC – system was done on the ward without the need of any sedative or analgetic drugs.

During the period of VAC treatment, all three patients were able ingest at least a semisolid diet. There was need neither of nasogastric decompression nor of a nasoenteral feeding tube.

The VAC-system was removed when the fistula had closed and healing was completed, which occurred after 7, 9 and 12 days, respectively. After removal of the VAC-system none of the three patients needed further surgery to close the cervical incision. In one of the patients a slight anastomotic stenosis occurred which could be conveniently handled by dilation.

3. Discussion

The VAC system offers several advantages as compared with the traditional treatment modalities [4]. The uniform negative pressure applied to the wound causes arteriolar dilation and thus increase of the microcirculation. By continuous suction fluid excess and edema are decreased, thereby reducing bacterial colonization. These positive effects promote granulation, tissue proliferation, and wound healing [5,6–8].

The rationale for the use of the mini-VAC-system was that patients are able to remain on a semisolid diet without the need of inconvenient nasogastric decompression and nasoenteral feeding, as well as the direct drainage of secretions from the wound which obviates the need for repeated daily changes of wound dressings.

Despite a short experience, the major advantages of the VAC-device in the treatment of collar esophago-gastric anastomosis justifies the attempt of treatment of different sizes of leakages.
References


