

SINGAPORE

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Specification

Invention Title:

A Dressing

The invention is described in the following statement

Title

A Dressing

Field of Invention

5 This invention concerns a dressing for debriding necrotic tissue using larvae.

Background of the Invention

 Maggot debridement therapy is used in the USA, United Kingdom, Israel, Sweden, Germany, Switzerland, Austria, Ukraine, Thailand and Canada. During
10 therapy, live maggot larvae are applied to a patient's open wound and remain in or on the wound for 36 to 48 hours. The application is usually repeated several times to achieve complete debridement.

Summary of the Invention

15 The invention is a dressing for debriding necrotic tissue using larvae, the dressing comprising:

 a flexible membrane shaped to cover an area of necrotic tissue without adhering to it, and adapted at its edges to seal against healthy skin to prevent the larvae from leaving the dressing and to prevent liquefied necrotic tissue from escaping;

20 at least one aperture in the membrane for the purposes of providing breathing air for the larvae, draining at least partially liquefied necrotic tissue or removing dead or satiated larvae from the dressing.

 The larvae may be maggots. The maggots may be genetically modified to die
25 before they become flies.

 The aperture may be partially closable to prevent drainage and removal of the larvae while still providing breathing air.

 The dressing may further comprise a second aperture. In this case one of the openings may be closable. If the dressing comprises two apertures, the first aperture
30 may be used for providing breathing air while the second aperture may be used for removing dead or satiated larvae from the dressing. In this case, a removable mesh may cover the first aperture to prevent the maggots from leaving the dressing via the first aperture.

 The dressing may further comprise a third aperture closable by another closure,
35 to receive a suction tube for removing dead or satiated larvae that cannot be removed via the second aperture.

The dressing may be in the form of a patch, a bag or a sleeve dressing type for application to different areas of a patient's body.

The patch type dressing may include a sticky border and a central non-sticky area.

5 In the bag type dressing, the edge of the membrane defines an open end of the dressing so that an entire hand, finger or foot may be inserted within the dressing. The aperture for draining liquefied necrotic tissue may be located opposite the open end.

In the sleeve type dressing, the edges of the membrane define two open ends of the dressing so that part of a torso, leg or arm may be inserted through the dressing.

10 The membrane may be made from a transparent plastic material that does not rupture during normal patient use. The membrane may have a thickness from between 0.25 to 1 centimetre.

The membrane may have cuffs at its edges to seal against the healthy skin of the patient with the aid of an adhesive dressing used for Ostomy dressings. These include
15 Mepilex Border, Duoderm, Biatin, Tielle, Versiva and Allevyn Plus Adhesive, which possess high levels of exudate so that the liquefied necrotic tissue does not seep through the dressing.

The dressing may be re-usable or disposable after a single use.

In use, the present invention provides a dressing that contains maggots on a
20 wound and prevents seepage of liquefied necrotic tissue from the dressing while allowing liquefied necrotic tissue to be drained and dead or satiated maggots to be removed. In at least one embodiment, the present invention enhances patient comfort during the debridement of necrotic tissue in which maggots are used and enables limited patient movement if necessary, depending on the injury.

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Brief Description of the Drawings

An example of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 is a sketch of the dressing partly covering the arm of a patient.

30 Figure 2 is a sketch of the dressing covering the leg and foot of a patient.

Figure 3 is a sketch of the drain tube and suction tube openings of the dressing.

Figure 4 is a sketch of an air inlet of the dressing.

Detailed Description of the Drawings

35 Referring to Figure 1, a maggot therapy dressing 10 is tailored to loosely cover an arm of a patient. Maggots are placed on a wound on the arm to debride necrotic

tissue from the wound. The maggots are genetically engineered so that they die prior to becoming flies. The dressing 10 includes a flexible membrane 13 and prevents the maggots from leaving the dressing 10 and liquefied necrotic tissue from escaping. Cuffs 11, 12 at the edges of the membrane 13 seal against healthy skin of the arm with
 5 the aid of an adhesive dressing similar to those used for Ostomy dressings. For example, Mepilex Border, Duoderm, Biatin, Tielle, Versiva, Allevyn Plus Adhesive. These dressings are used for wounds with high or extra high levels of exudate so that the liquefied necrotic tissue does not seep through the dressing 10.

The membrane 13 is made from a flexible sterilized plastic that is transparent so
 10 that the maggots and liquefied necrotic tissue are observable without opening the dressing 10. The thickness of the membrane 13 is pre-determined to prevent rupture during normal patient movement. Depending on the material strength of the membrane 13, the thickness of the material can range from 0.25 centimeters to one centimeter. The thickness taper towards its edges so that the cuffs 11, 12 of the membrane 13 can be
 15 easily sealed against the arm.

Referring to Figure 3, the dressing 10 has a drain tube opening 30 for connection with a drain tube 33, a suction tube opening 20 for connection with a suction tube 21 and air inlets 40. The material strength of the membrane 13 is pre-determined to support the drain tube opening 30, suction tube opening 20 and air inlets 40. The drain
 20 tube 33 is also made from a sterilized plastic. The end of the drain tube 33 and drain tube opening 30 are both threaded 34 to securely connect the tube 33 to the opening 30 for an extended period of time. The drain tube opening 30 is covered by two different covers. Firstly, it can be covered with a mesh 31 a plastic door 32 hinged to the dressing 10 to cover the mesh 31. The mesh 31 prevents the maggots from leaving the
 25 dressing 10 when the door 32 is open. When the door 32 is closed, the drain tube opening 30 is tightly sealed. Secondly, the opening 30 can be covered only by the plastic door 32 without a mesh. The choice of covering provides flexibility in the maggot debridement treatment.

The suction tube opening 20 is also covered by a plastic door 22 hinged to the
 30 dressing. When the door 22 is opened, the suction tube 21 is inserted and manipulated to remove dead or satiated maggots within the dressing 10. Alternatively, the maggots can be suctioned out of the dressing 10 via the drain pipe opening 30 when no mesh screen 31 covers the drain tube opening 30. The size of the tube openings 20, 30 is dependent on the size of the drain 33 and suction tubes 21, respectively. Depending on
 35 the position of the drain tube opening 30 relative to the wound and the location of dead

or satiated maggots, these maggots can be removed by either via the drain tube 33 or suction tube 21.

Referring to Figure 4, air inlets 40 provide breathing air to the maggots and also provide circulating air within the dressing 10 for patient comfort and reduction of
 5 itching and other irritating side effects. Air inlets 40 are covered by a screen 41 made from a mesh substance that allows air circulation but prevents maggots from leaving the dressing 10. An air door 42 is hinged to the dressing 10 to cover the screen 41 and seal the inlet 40 when closed. Opening and closing air doors 42 allows the amount of air being introduced into the dressing 10 to be controlled. The number of air inlets 40
 10 provided is dependent on the size of the dressing 10. More air inlets 40 are distributed on the top and sides of the dressing 10 in comparison to the bottom or floor of the dressing 10, where the arm would normally rest. This distribution minimises the collection of any seepage from the liquefied necrotic tissue.

Referring to Figure 2, a dressing 10 for use with an entire hand, finger, toe, or
 15 foot is provided. The edges of the membrane 13 define a single open end of the dressing 10 for the insertion of whole limbs. At the other end of the dressing 10, a drain tube opening 30 is provided for attachment with a drain tube 33 to drain liquefied necrotic tissue that gathers in this region of the dressing 10. Both the drain tube opening 30 and tube end 34 are threaded to be screwed together so that the drain tube
 20 33 can be securely connected to the dressing 10 for an extended period of time. Covering the drain tube opening 30 is a removable mesh screen 31 that can be covered by a drain door 32. The mesh screen 31 is made of a parachute material or other fabric that allows easy drainage but prevents live maggots from leaving the dressing 10. The dressing 10 also has a drain tube opening 35 without a mesh screen 31 so that when the
 25 drain tube 33 is attached, dead maggots can be drained from the dressing 10.

The dressing 10 provides a suction tube opening 20 which can be closed by a door 22 hinged to the dressing 10. A suction tube 21 is introduced into the dressing 10 via the opening 20 to remove the dead or satiated maggots. If dead maggots are not located near enough to the drain door 32 for removal, the suction tube 21 can be
 30 manipulated to reach those areas. This is useful in countries where genetically modified maggots are not available or prohibitively expensive to use.

In a typical scenario, maggots are placed on the wound and the dressing 10 is slipped over the arm. The cuffs 11, 12 of the dressing 10 are then sealed against the skin of the patient. Generally, maggots remain on the wound for a minimum of 48
 35 hours. Depending on the results, the process of removing dead maggots and liquefied necrotic tissue and placing new maggots on the wound is repeated at regular intervals

until the wound has been substantially debrided of necrotic tissue. This involves up to six or seven multiple sessions.

Although a drain hole opening 30 and a suction hole opening 20 have been described, it is envisaged that the dressing 10 could have a single opening for drainage
5 and suction.

Although the drain and suction doors 32, 22 have been described as made from light weight sterilized rigid plastic, light weight sterilized metal or other combination of materials may also be used.

It is envisaged that maggot therapy dressings 10 may be disposable after a single
10 use or reusable for multiple use. Multiple use dressing 10 can be reused after cleaning and sterilization subsequent to each use.

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly
15 described. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.

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