Title: A SURGICAL CORRUGATED TUBE DRAIN

Abstract: The present invention relates to a surgical corrugated tube drain (1) for abdomen surgery and other surgery which is used to remove unwanted fluid which may serve as a breeding ground for infection or cause discomfort. The surgical corrugated tube drain (1) has an anterior section which is corrugated, followed by tube with a collection bag at the end. The surgical corrugated tube drain (1) also reduces blockage which occurs in the tube drain. The fan shaped corrugated sheet (2) is connected at fringe (4) of the drain tube (3). It is useful as a negative suction drain after abdominal surgery. The corrugated tube drain provides leakage free and blockage free draining.

Fig. 1

Declarations under Rule 4.17:
— as to the identity of the inventor (Rule 4.17(i))
— as to applicant’s entitlement to apply for and be granted a patent (Rule 4.17(ii))
— of inventorship (Rule 4.17(iv))

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— without international search report and to be republished upon receipt of that report (Rule 48.2(g))
A SURGICAL CORRUGATED TUBE DRAIN

Field of the invention

The present invention relates to a surgical corrugated tube drain more specifically for abdominal surgery. It relates to corrugated tube drain which is inserted into open wound of surgery to facilitate the drainage of unwanted fluids.

Background and prior art of the invention

A surgical drainage tube is used to remove pus, blood or other fluids from a wound. Drains inserted after surgery do not result in faster wound healing or prevent infection but are sometimes necessary to drain body fluid which may accumulate and in itself become a focus of infection. Drains have a tendency to become occluded or clogged resulting in retained fluid that can contribute to infection or other complications. Thus efforts must be made to maintain and assess patency when they are in use. Once a drain becomes clogged or occluded, it is usually removed as it is no longer providing any benefit. The yield of body fluids during healing process creates a problem that they interfere with the healing process if they are allowed to accumulate. As a
result, a number of drainage device have been developed to assist drainage from the wound area for the natural healing process.

Surgical drains can be broadly classified in two types, tube drain and corrugated drain. Generally, corrugated drainage sheets are used for efficient multichannel wound drainage especially where airtight closure of wound is not possible. The corrugations provide an increased surface area for capillary action of fluid and also serve as channels for fluid flow. In general, corrugated drain sheet is considered as an open type of drain.

The open drainage system is a tube which is inserted into the body and drains out onto a dressing. They drain fluid on to a gauze pad or into a stoma bag. They are inserted directly into the wound bed and they drain into a dressing. Basically, open drains increase the risk of infection.

Closed drains are formed by tubes draining into a bag or bottle. For example chest, abdominal and orthopedic drains are one type of closed drain. Generally, the risk of infection is reduced in the closed drain. The use of a closed drain system lowers the risk of potential infection for patients and also reduces staff contact with body fluids.
The close drainage system comprises a tube which is attached to the bag to remove fluids in an airtight circuit that prevents any type of environmental contaminants from entering the wound or area being drained.

Another type of wound dressing uses a porous foam insert which is inserted into a wound. A drainage tube or a drainage pump is combined with the porous foam insert to form a system which exudates from the wound. There are problems associated with this type of dressing. In this type of wound drainage, more chances are present that drains may be clogged or occluded.

Several other methods of wound draining are known. For example, suction therapy or drain therapy. All these techniques are directed to the same goal, which is the removal of blood, pus, or other fluids from wound. These methods use devices that have been developed for use in treatment of a variety of wound types.

While addressing the basic need to protect wound during the healing process, the prior art has failed to provide wound treatment. Available surgical drain devices suffer from several deficiencies, particularly when applied following abdominal surgery. They fail to drain fluid adequately, are prone to clogging and occluding within the wound. Thus, there remains a need to
develop improved treatments for surgical wounds. The need is particularly acute in abdominal surgery also for any surgical wound predisposed to conditions of excess fluid drainage.

**Object of the invention**

The main object of the present invention is to provide a surgical corrugated tube drain.

Another object of the present invention is to provide an improved surgical tube drain for abdominal surgery.

Yet another object of the present invention is to provide leakage free and blockage free tube drain.

Further object of the present invention is to provide a tube drain tube with lower risk of potential infection.

**Summary of the Invention**

The present invention relates to a surgical corrugated tube drain for abdomen surgery and other surgery which is used to remove unwanted fluid which may serve as a breeding ground for infection or cause discomfort. The corrugated tube drain has an anterior section which is corrugated, followed by tube with a collection bag at the end. The corrugated tube drain reduces
blockage which occurs in the tube drain. The corrugated tube drain is also useful to remove unwanted fluid by negative suction drain for abdominal surgery.

**Detail description of the drawings**

The invention will be better understood by reference to the following description taken in conjunction with the accompanying drawing, in which:

Fig. 1 depicts a surgical corrugated tube drain.

Fig. 2 depicts side view of a surgical corrugated tube drain.

Fig. 3 depicts cross-sectional view of a surgical corrugated tube drain.

Fig. 4 depicts side view of an embodiment of a surgical corrugated tube drain.

Fig. 5 depicts a surgical corrugated tube drain with apertures.

**Detailed description of the invention**

The nature of the invention and the manner in which it is performed is clearly described in the specification. The invention has various components and they are clearly described in the following pages of the complete specification.

The present invention provides a surgical corrugated tube drain to drain unwanted fluid from surgical wound. Surgical drains are used in a wide
variety of different types of surgery. The intention is to decompress or drain either fluid or air from the area of surgery. The tube efficiently promotes the healing of even large area wounds such as those resulting from abdominal flap surgery.

Fig. 1 and Fig. 2 illustrate the present surgical corrugated tube drain (1) consisting of a fan shaped corrugated sheet (2), a drain tube (3) with collection bag at its end (not shown). The surgical corrugated tube drain (1) according to the invention is inserted through an incision in the skin of a patient and placed within a wound formed after surgery. The tube according to the invention includes a fan shaped corrugated sheet (2) tapering towards the bottom and attached at distal end to drain tube (3). The frontal part of corrugated sheet (2) is inserted into the wound of the patient and other end of corrugated sheet (2) is attached with drain tube (3) at the fringe (4). The corrugated tube (2) is intended to be sufficiently folded such that the frontal part of corrugated tube (2) is easily inserted through an incision in the skin of a patient. The removal of from the patient is very easy as the corrugated sheet is flexible and is folded due to its fan shaped corrugation. The drain tube collects and removes fluid from the abdominal region through the corrugated sheet (2), which diverts the fluid
outside the patient through the drain tube (3). The corrugation produces channels through which the fluid is drained into drain tube (3) through capillary action.

FIG. 3(a) and 3(b) shows a cross-sectional view of a surgical corrugated tube drain (1) according to the invention. The drain tube (3) also has wavy lumen so there is no or less chance of blockage occurs in the tube. Because of the wavy centre there is no need to change the drain frequently due to clogging. The pus, blood or other fluids from a wound is removed from the corrugated portion to drain tube (3) and collected in the collection bag through capillary action.

FIG. 4 depicts representative embodiment of a drain device according to the invention, showing possible configuration of the surgical corrugated tube drain (1) within the device. The sides of lower end of corrugated sheet (2) are attached to the projections (5) on the mouth of the drain tube (3) in such a way that it facilitates the flow of fluids into drain tube (3) through both faces. The use of fan shaped corrugated sheet (2) ensures that the drain tube remains in position within the patient and that the drain tube can be removed easily at the appropriate time, without disrupting the wound healing process.
Fig. 5 shows another embodiment of a surgical corrugated tube drain (1). In a preferred embodiment, the corrugated sheet (2) has aperture (6) along its length at certain intervals to drain fluid from beneath. The size of aperture (6) is such that no tissue parses along with fluid into the drain tube.

The size of corrugated tube can vary depending upon the needs of the device, including the amount of fluid to be drained and the size of the wound and shape of the device. The surgical corrugated tube drain can be fabricated from any biocompatible thermoplastic or thermoset material. Examples include surgical grade silicone rubber, polyurethane, polyamide, polyimide, PEEK (polyether ether ketone), polycarbonate, PMMA (polymethylmethacrylate), and polyvinylchloride.

In the present corrugated tube drain the chance of clogging or occluding is very low. It is closed type of drain and no frequent change of dressing is required as it has a collection bag attached with it. There are no or less chances of ascending infection as it is closed type of drain.

While various embodiments of the present invention been described in detailed, it is apparent that modification and adaptation of those embodiments will occur to those skilled in the art. It is expressly understood, however, that
such modifications and adaptations are within the spirit and scope of the present invention as set forth in the following claims.
We Claim,

1. A surgical corrugated tube drain consists of a corrugated sheet (2) attached to a fringe (4) of a drain tube (3) and a collection bag at another end of said drain tube (3).

2. The surgical corrugated tube drain as claimed in claim 1, wherein the drain tube (3) has a wavy lumen.

3. The surgical corrugated tube drain as claimed in claim 1, wherein the pus, blood or other fluids from a wound is drained through the corrugated sheet (2) into drain tube (3) and collected in the collection bag.

4. The surgical corrugated tube drain as claimed in claim 1, wherein the pus, blood or other fluids from a wound is drained through capillary action.

5. The surgical corrugated tube drain as claimed in claim 1, wherein the corrugated sheet (2) has apertures (6) at predetermined intervals to drain fluid from beneath.

6. A surgical corrugated tube drain consist of corrugated sheet (2) attached to at one end of a drain tube (3) by projections (5) and a collection bag at the another end of said drain tube (3);

   wherein said projections (5) are at the centre of drain tube (3).
7. **The surgical corrugated tube drain** as claimed in claim 6, wherein the drain tube (3) has a wavy lumen.

8. **The surgical corrugated tube drain** as claimed in claim 6, wherein the pus, blood or other fluids from a wound is drained through both faces of drain tube (3).

9. **The surgical corrugated tube drain** as claimed in claim 6, wherein the pus, blood or other fluids from a wound is drained through capillary action.

10. **The surgical corrugated tube drain** as claimed in claim 6, wherein the corrugated sheet (2) has apertures (6) at predetermined intervals to drain fluid from beneath.