

April 22, 1952

D. J. CALICCHIO
SURGICAL DRAINAGE TUBE
Filed July 19, 1950

2,593,980

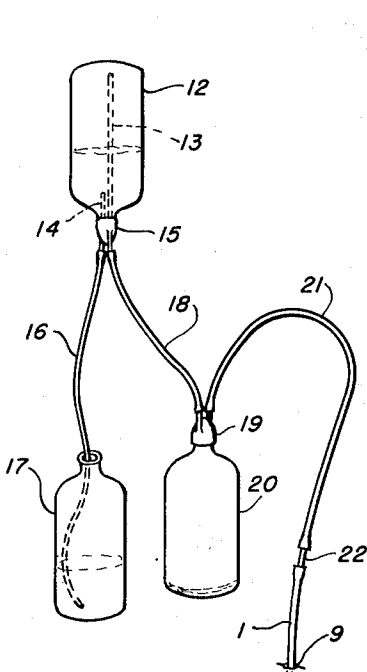


Fig. 2.

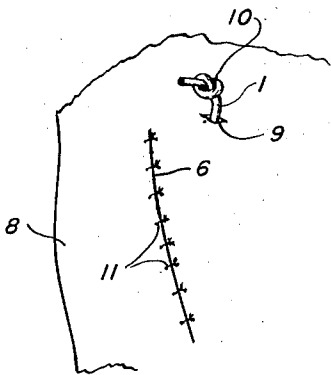
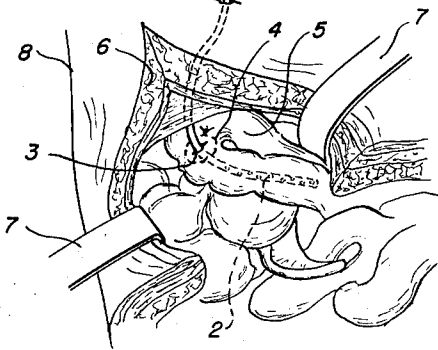


Fig. 3.

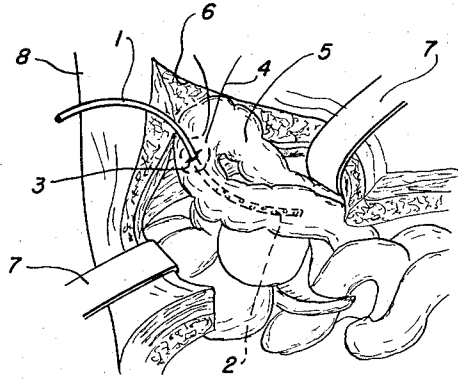


Fig. 1.

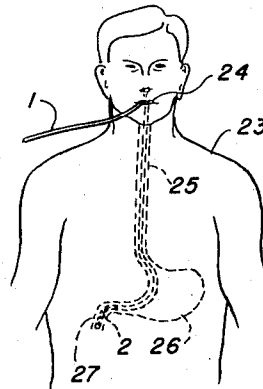


Fig. 4.

Inventor
David J. Calicchio
by *Reiss and Reiss*
Attorneys

UNITED STATES PATENT OFFICE

2,593,980

SURGICAL DRAINAGE TUBE

David J. Calicchio, Boston, Mass.

Application July 19, 1950, Serial No. 174,695

2 Claims. (Cl. 128—350)

1

2

The present invention relates to surgery.

After an abdominal operation, gas and other fluids usually collect in the gastro-intestinal tract, causing distention, with resulting gas pains and other discomfort. In the endeavor to relieve this abdominal distress, it is customary to employ a Levin or a Miller Abbott drainage tube or a modification thereof. In order to reach the stomach or the intestines, however, it is necessary to thread the tube through the nose or the mouth into the stomach, and through the stomach into the intestines; then to keep the parts external to the patient in proper position for perhaps several days, during both waking and sleeping hours; and, finally, after the distention has disappeared, to pull the tube out again. This does not add to the comfort of the patient during the after-effects of the operation.

An object of the present invention is to improve upon present-day methods of post-operative care of the patient, with the end in view of either eliminating altogether the necessity for threading the drainage tube through the mouth or the nose, or, if it is decided to employ it, to avoid the necessity for withdrawing it later from the patient's interior.

Another object is to provide a new and improved drainage tube.

Other and further objects will be explained hereinafter, and will be particularly pointed out in the appended claims.

With the above objects in view, a feature of the invention resides in a drainage tube of absorbable material, such as plain or chromic catgut. One end of this tube of absorbable material is inserted into the stomach, or the bowel, or both at the very time of the operation; and, according to a feature of the invention, it is inserted, not through the mouth or the nose, but directly through an opening that the surgeon deliberately cuts into the wall of the stomach or the bowel at the time of the operation, when such wall is accessible to the surgeon for making the cut. The drainage tube, so inserted in the stomach or the bowel, is left in place at the time of the closure of the operative wound. The other end of the drainage tube, led out from the patient's interior through a stab wound in the patient's abdominal wall, is connected to a conventional pump, with the aid of which the contents of the stomach or the intestine or both are removed, in the customary manner, during the next several days, through perforations in the wall of the drainage tube. It is not necessary to add to the patient's discomfort by finally removing the drainage tube, however, because, by the time of the patient's re-

covery, his system will have absorbed the material of which the drainage tube is constituted.

According to another feature of the invention, the surgeon does not need to cut into the wall of the stomach or the intestine during the operation. The drainage tube may be inserted post-operatively, through the mouth, or the nose, in the customary manner. Even in such cases, however, the advantageous feature of the present invention may still be employed, in that it is not necessary thereafter to remove the drainage tube from the patient's system, because it will have become absorbed during the period of the patient's recovery.

The invention will now be described more fully in connection with the accompanying drawings, in which Fig. 1 is a diagrammatic perspective showing a drainage tube embodying the present invention inserted into a patient's intestine, in accordance with a feature of the present invention, prior to the closing of the operative wound; Fig. 2 is a similar view illustrating a subsequent step in the method of the present invention. Fig. 3 is a similar view illustrating a still later step of the method, involving the tying of the free end of the drainage tube after the patient's abdominal distention has disappeared; and Fig. 4 is an elevation illustrating a modified method according to the present invention.

The drainage tube 1 of the present invention is constituted of a material that is absorbable by the human system, such as plain or chromic catgut. It is made in various lengths and different diameters, depending upon the particular use to which it may be put. One end 2 of the drainage tube 1 is shown provided with a plurality of perforations, for a purpose to be presently described. This end 2 of the drainage tube 1 is shown open, but it may be expanded into a perforated ball, not shown, at its very tip. It is shown single-compartmented, but it may be longitudinally divided into two compartments, one for suction and the other for inflation.

During the performance of an abdominal surgical operation, at a time when the walls of the operative wound 6 in the abdomen 8 of the patient 23 are held open by retractors 7, the surgeon, in accordance with a feature of the invention, temporarily interrupts the operation to make a small puncture incision 3 in the anterior wall of the small bowel 5 or the stomach 25 or any other viscus. Where the incision 3 is made depends upon the location that the surgeon may desire to deflate. He then inserts one end 2 of the drainage tube 1 through the opening in the viscus produced by the incision 3. If he

3

should produce the incision 3 in the stomach 26, for example, he would thread the end 2 of the drainage tube 1 into the stomach 26 and, through the pylorus 27, as far down into the small bowel 5 as he may consider to be desirable. By providing a sufficient length of the end 2 of the drainage tube 1 with perforations, this will enable draining both the stomach 26 and any desired length of the small intestine 5. The walls of the opening in the viscus produced by the incision 3 are closed around the drainage tube 1 with the aid of suitable stitching material 4. In Figs. 1 and 2, the stitching material 4 is shown producing a purse-string suture. The purse-string suture may be reinforced by several additional interrupted sutures, not shown. A tab of omentum may be patched around the opening produced by the incision 3 to seal it more promptly, but this is omitted from the drawings, in order to simplify the disclosure.

The other end of the drainage tube may be brought out from the interior of the patient 23 either through the same surgical incision 6 or through an additional stab-wound incision 9 in the abdominal wall, after which the surgeon proceeds with the operation, ultimately closing said surgical wound 6 at 11. The other end of the drainage tube 1 is then connected to a drainage pump in any well known manner for which reason it is shown unperforated. As an illustration, the said other end of the drainage tube 1 is shown connected by means of a glass tube 22 to one end of a rubber hose 21 the other end of which, together with one end of a rubber hose 18, are shown connected at 19 to a vacuum vessel 20. The other end of the rubber tube 18 and one end of a rubber tube 16 are shown connected at 15 to an inverted liquid-containing vessel 12 provided with a vertically disposed glass tube 13, the lower end of which is connected to the rubber tube 18, and a vertically disposed glass tube 14 the lower end of which is connected to the said end of the rubber tube 16. The upper ends of the glass tubes 13 and 14 are disposed respectively above and below the level of the liquid in the vessel 12. As the liquid in the vessel 12 therefore tends to flow by gravity through the glass tube 14 and the rubber tube 16 into a vessel 17 upon the floor, below the patient, a vacuum tends to be produced above the level of the liquid in the vessel 12, resulting in the pumping out, by suction in the vessels 12 and 20, of gas and liquid in the stomach 26 or the intestine 5 or both through the perforations in the end 2 of the drainage tube 1.

4

Stitching material 4 may, of course, be employed around the incision 9, as well as around the incision 3.

When the patient 23 has recovered sufficiently so that drainage or decompression is no longer needed, the drainage tube 1 is disconnected from the pump, it is tied into a knot 10 close to the abdomen 3, and its excess above the knot 10 is cut away. It is not necessary to remove the portion of the drainage tube remaining in the patient, for it will become absorbed by his system, in the same manner that catgut sutures are absorbed.

According to another feature of the invention, illustrated in Fig. 4, the end 2 of the drainage tube 1 may be inserted into the stomach 26 and, if desired, through the pylorus 27, into the intestine 5, by the customary method, dreaded by all patients, of threading it through the nose or mouth 24 and down the esophagus 25. In that event, of course, it is desirable that the drainage tube 1 be of the same small diameter as the red rubber tubes that are customarily to-day passed through the nose or the mouth 24, down the esophagus 25, into the stomach 26. The other end of the drainage tube 1 may be connected to the pump in the same manner already described. The present invention has the advantage however, that, unlike present-day practice, it is not necessary to remove the drainage tube 1, for it will become absorbed.

Further modifications will occur to persons skilled in the art, and all such are considered to fall within the spirit and scope of the invention, as defined in the appended claims.

What is claimed is:

1. A drainage tube of material that is absorbable by the human system provided with a plurality of perforations at one end and that is unperforated at its other end.

2. An absorbable catgut drainage tube provided with a plurality of perforations at one end and that is unperforated at its other end.

DAVID J. CALICCHIO.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,374,808	Bethune	Apr. 12, 1921
2,127,903	Bowen	Aug. 23, 1938
2,489,067	Wild	Nov. 22, 1949
2,508,690	Schmerl	May 23, 1950