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Smith

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[54] **APPARATUS AND METHOD FOR THE APPLICATION OF A CONTINUOUS SOMATIC NERVE BLOCK**

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[52] **U.S. Cl.** ..... **128/213,** 128/303 R, 128/348, 128/001 R

[51] **Int. Cl.** **A61m 5/14,** A61m 25/00

[58] **Field of Search** ..... 128/001 R, 213, 303 R, 128/348, 350 R

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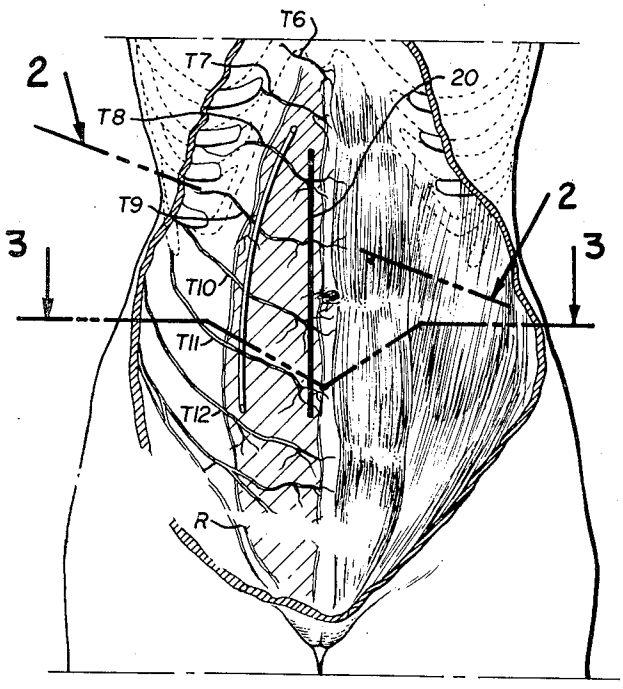
Attorney, Agent, or Firm—Van Valkenburgh, Lowe & Law

[57] **ABSTRACT**

A method of applying an analgesic for controlling postoperative pain, where somatic nerves in the patient's body are severed, as during an operation. A stylette is used to thread a porous infusion tube through the patient's body wall along a course which traverses the nerves to be blocked After the infusion tube is properly located, analgesic delivered into the tube will pass through the wall of the tube into the patient's body at the nerve locations.

The stylette is a curved rod whose diameter is the same as the infusion tube. The point at the leading end is rounded. A stub at the trailing end connects with the infusion tube, all in an arrangement to permit effective threading and placement of the tube.

12 Claims, 12 Drawing Figures



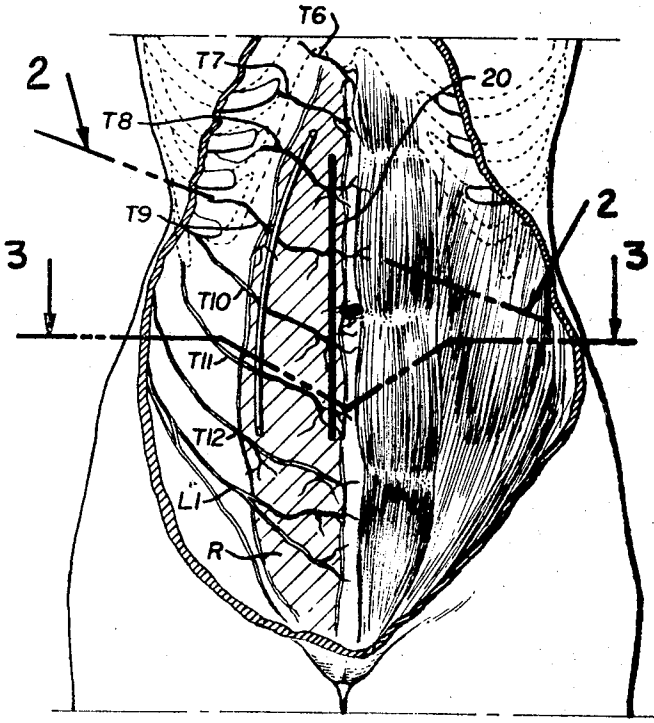


Fig. 1

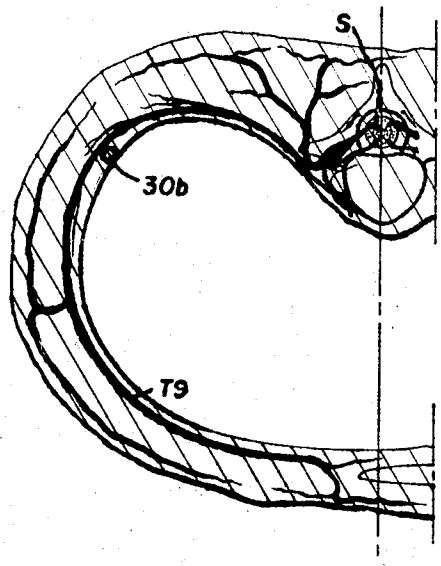


Fig. 2

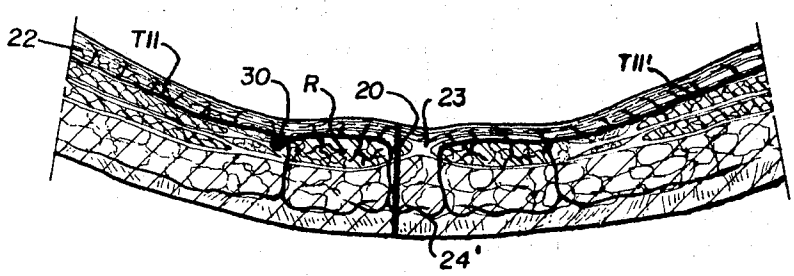


Fig. 3

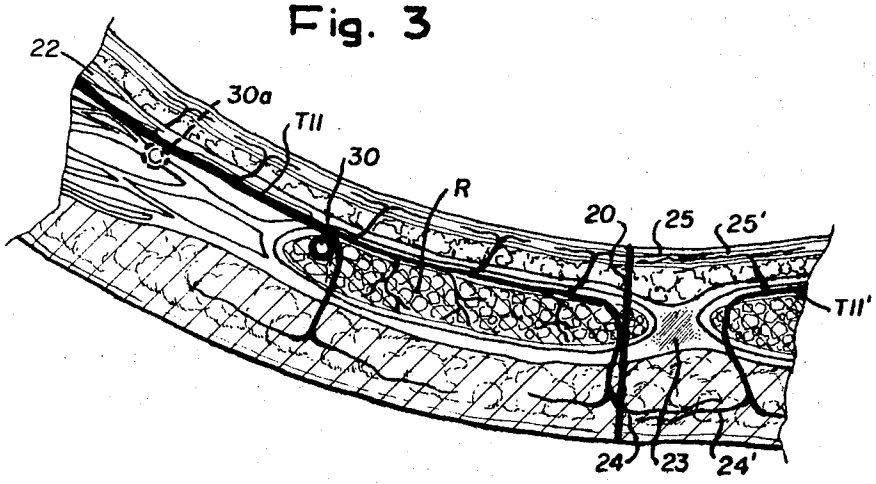


Fig. 4

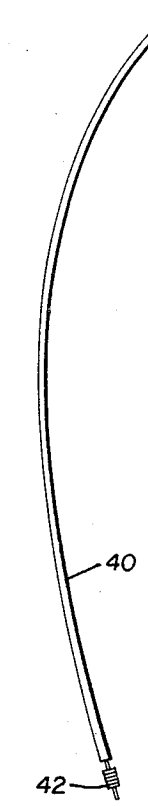


Fig. 5

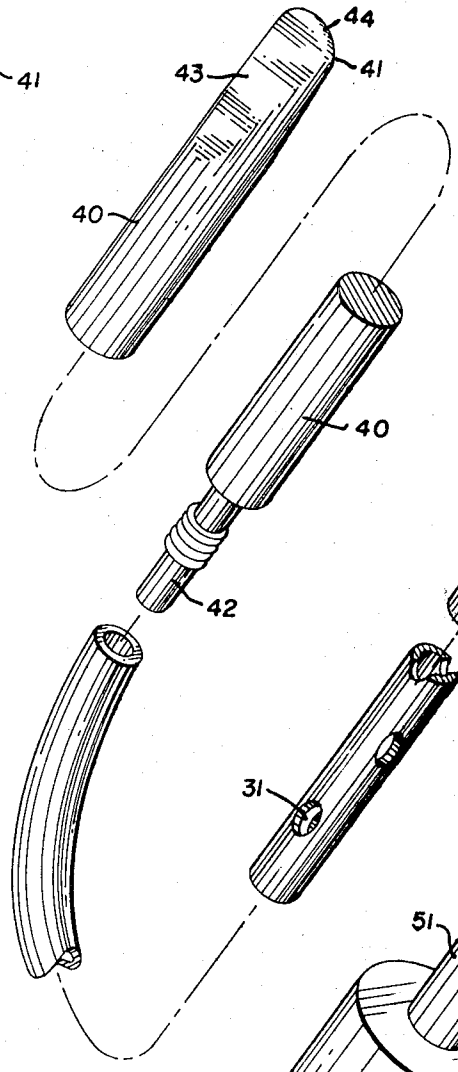


Fig. 6

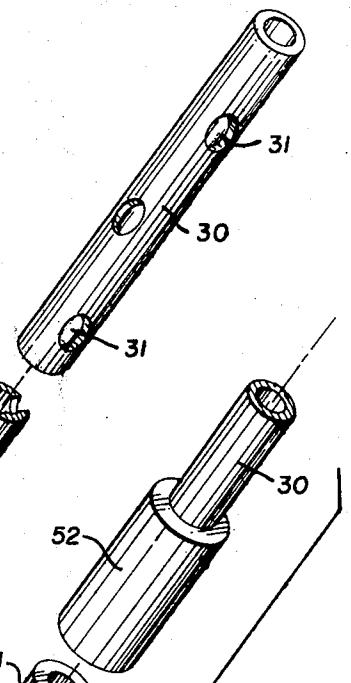
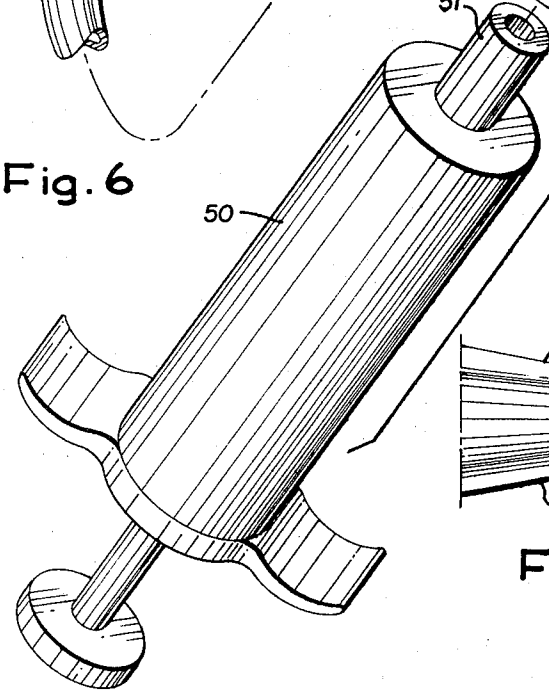


Fig. 7



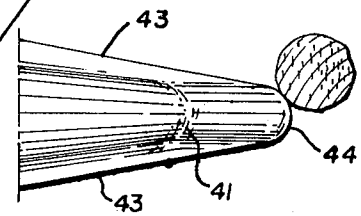


Fig. 8

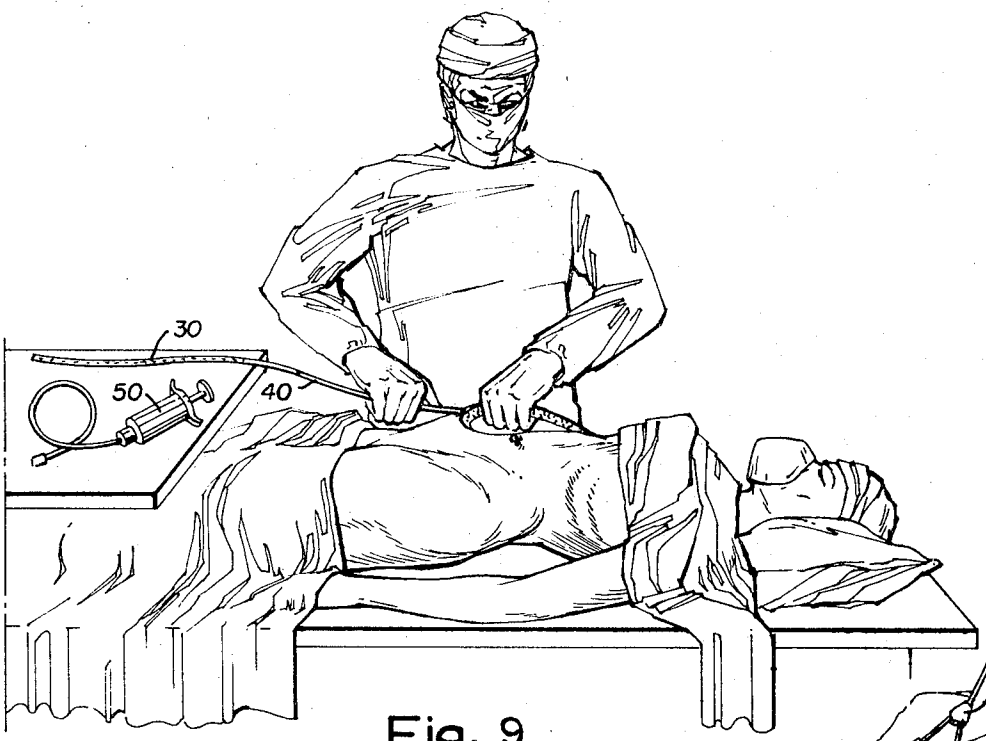


Fig. 9

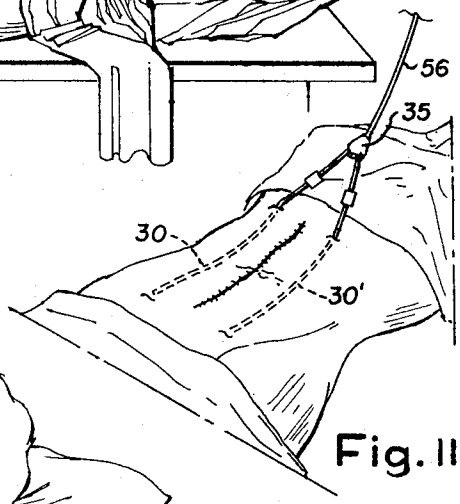


Fig. 11

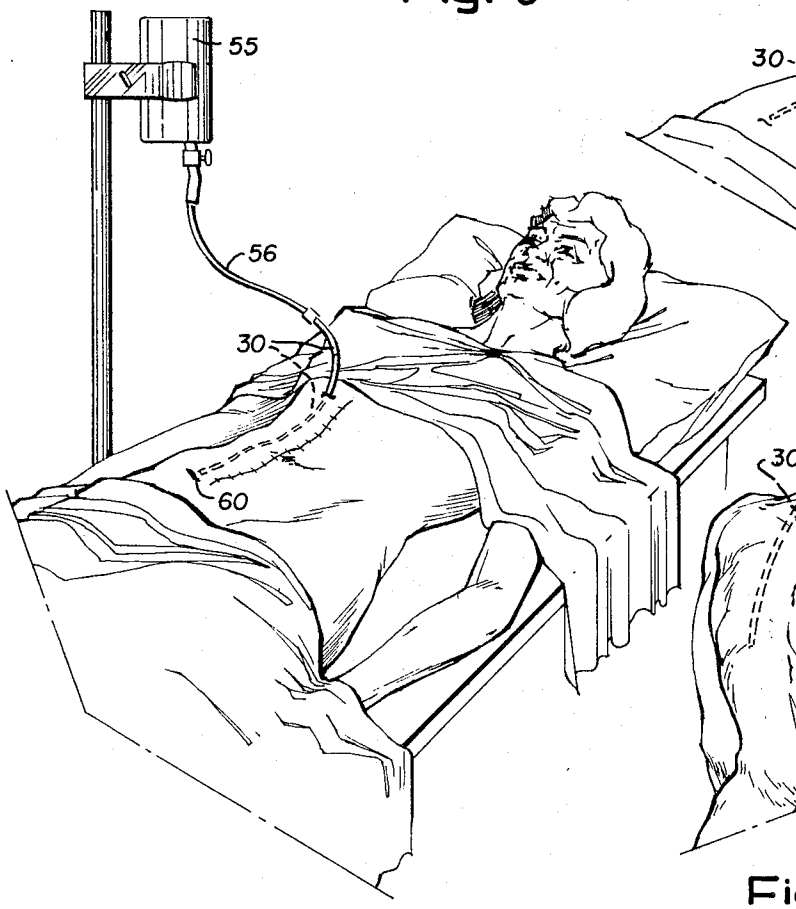


Fig. 10

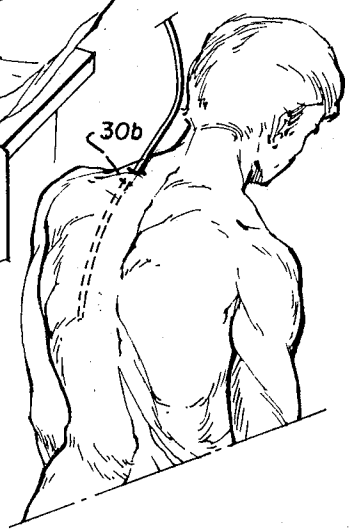


Fig. 12

APPARATUS AND METHOD FOR THE APPLICATION OF A CONTINUOUS SOMATIC NERVE BLOCK

The present invention relates to methods and apparatus for producing localized analgesia and more particularly, to improvements in the application of analgesics for controlling postoperative pain.

The postoperative pain resulting from surgery, and especially from abdominal surgery can become almost unbearable resulting not only in intense discomfort, but also restricted and shallow breathing which can lead to atelectasis. To relieve the patient, narcotic analgesics are commonly administered. However, in doing so, care must be exercised to avoid desensitizing or immobilizing the patient's normal body functions and also, care must be exercised to avoid addiction to the narcotic.

Recognizing these factors, local nerve blocks, similar to blocks used for surgery, are sometimes administered by injection at critical points into the patient's body. For example, an intercostal nerve block for upper abdominal operations has been heretofore used with indifferent success by multiple injections. However, this entire approach to the problem has proven to be unsatisfactory, especially in an operation where an array of nerves must be desensitized.

The present invention was conceived and developed with the foregoing considerations in view, and the invention comprises, in essence, a procedure wherein an infusion tube having a selected porous reach is threaded into the patient's body to traverse and lie alongside a selected array of nerves, with the porous reach at the nerves. The tube is then prepared to receive an analgesic solution as either an intermittent or a continuous infusion which will be directed through the tube and to the nerve, or nerves.

The invention is especially suited for chest or abdominal surgical operations wherein it is desired to block the somatic nerves severed by the incision to relieve the postoperative pain of the incision. This is rendered possible because somatic nerves are associated with each other in such a manner as to enable the surgeon to usually select an easily defined, direct path through reaches between the patient's muscle and fascia structures which will be adjacent to and will traverse the nerve system to be blocked. The selected path will be first traversed by a stylette for threading the infusion tube into place without damaging any tissue. In considering possible somatic nerve block paths, it was found that in every practical instance, the path would approximately define a segment of an elliptical curve, a factor which establishes the design of stylettes for the specific purposes as hereinafter described in detail.

An excellent example of surgical operations where the invention is especially effective, is found in the group of abdominal operations where a vertical incision is made through a rectus muscle and it becomes desirable to block any portion of the group of the nerves which enter the sheath of this muscle and which may include the sixth through the 12th thoracic nerves and the first lumbar nerve. Accordingly, the description of the invention, as hereinafter set forth, relates primarily to the blocking of a portion of this group of nerves. However, it is to be understood that the teachings of the invention can easily be applied to other nerve groups as the occasion may arise.

It follows that a primary object of the invention is to provide a novel and improved method for a continuous or intermittent, selectively-regulated introduction of an analgesic solution into specific regions within a patient's body to most effectively minimize postoperative pain.

Another object of the invention is to provide a novel and improved method for controlling postoperative pain which will be restricted to local regions of the patient's body, which requires only a minimum amount of a comparatively mild analgesic of a type which is easily and quickly metabolized by the patient and which will usually eliminate the need for narcotic analgesics.

Another object of the invention is to provide a novel and improved method for controlling postoperative pain, resulting from an abdominal operation, which not only minimizes the patient's pain and discomfort, but also avoids abnormal and restricted breathing, a serious postoperative hazard.

Another object of the invention is to provide a method for the application of analgesics for relief of postoperative pain which incorporates a novel and improved arrangement of components and procedures permitting the placement of the components thereof within the patient's body as a procedure associated with the operation itself and while the patient is still under anesthesia.

Another object of the invention is to provide a novel, improved and simplified apparatus for accomplishing the introduction of an analgesic solution into specific regions of a patient's body which may function in an automatic manner, requiring a minimum of attention when in use.

With the foregoing and other objects in view, all of which more fully hereinafter appear, my invention comprises certain procedures, sequences and steps, and combinations, constructions and components, all as hereinafter more fully described, defined in the appended claims and further exemplified in the accompanying drawings in which:

FIG. 1 is a front view anatomical diagram of the abdominal muscle structures with a portion of the right rectus muscle being removed to illustrate the reach of the sixth through the 12th thoracic nerves and the first lumbar nerve which will lie, generally, against the sheath of the rectus muscle, the view also indicating the line of a vertical incision through the right rectus muscle and the approximate location of an infusion tube within the sheath of the rectus muscle to administer an analgesic according to the principles of the invention.

FIG. 2 is a diagrammatic sectional view of the right side of a patient's body wall to illustrate, in an approximate manner, the path of a thoracic nerve, the view being approximately from the indicated line 2—2 at FIG. 1, but on an enlarged scale.

FIG. 3 is a fragmentary sectional view of the frontal portion of the abdominal wall as taken from the indicated line 3—3 at FIG. 1, but on an enlarged scale, the figure showing the terminal reaches of the somatic nerves.

FIG. 4 is a fragmentary portion of the showing at FIG. 3, but on a further enlarged scale to better illustrate the manner in which the rectus muscle is confined within its sheath and also, suitable locations for an infusion tube adjacent to the somatic nerve. FIG. 5 is a plan view of a stylette which is formed to permit threading

an analgesic infusion tube through the body structure according to the invention.

FIG. 6 is a perspective fragmentary view of the stylette and a tube which is to be attached thereto, the view being on a greatly enlarged scale with the components being disconnected from each other and with portions of each component being broken away to conserve space.

FIG. 7 is a perspective view of one type of syringe which may be used to supply analgesic to the infusion tube.

FIG. 8 is a fragmentary side view of the point of the stylette, on a greatly enlarged scale, to better illustrate the manner in which the edges of this point are rounded and illustrating further, in a diagrammatic manner, a typical nerve which is being contacted by the point of the stylette.

FIG. 9 is a sketch illustrating a patient undergoing abdominal surgery and a surgeon applying the stylette in accordance with the principles of the invention.

FIG. 10 is a sketch showing the patient after surgery, with the infusion tube applied to the patient and with a bottle connected to the infusion tube to introduce analgesic in accordance with the invention.

FIG. 11 is a fragment of the sketch shown at FIG. 10 but illustrating a pair of infusion tubes applied to the patient to introduce analgesic to the somatic nerves at both sides of the patient's body.

FIG. 12 is a view of a patient's back showing, in dotted lines, another reach, at the patient's rib cage, where analgesia may be applied to the thoracic nerves as at a location which is suitable for relieving the postoperative pain of a chest operation.

The advantages of a mild analgesic over narcotics for the relief of pain are well known. However, a major limitation in the use of analgesics to control the postoperative pain of major surgery has been the difficulty in effectively applying the analgesic to block the nerves injured by the surgery. The present invention discloses a method where the analgesic may be applied as between layers of tissue where the nerves to be blocked are located, and preferably near but not at the surgical incision. This is desirable because the region of the patient's body which is desensitized by the analgesic is then kept to a minimum.

An ideal analgesic for the present invention is Xylocaine, commonly sold as Lidocaine, and Lidocaine is representative of other effective, local and infiltrative analgesics which function in a similar manner. To test the effectiveness of the procedures which constitute the invention, a number of abdominal surgical operations were performed and the postoperative pain, controlled as hereinafter described, was controlled by a 1 percent commercially packaged Lidocaine solution as sold by Astra Pharmaceutical Products, Inc. of Worcester, Mass.

It was discovered that the total amount of Lidocaine required was not large. The Lidocaine could be administered either continuously or intermittently at a rate of approximately 5–10 cc/hr., that is, 50 to 100 mg/hr, and this amount would usually permit the patient to remain quite comfortable. Considering the nature of the surgery, this is a surprisingly small dosage when recommended intravenous doses of Lidocaine, for other purposes, may be as much as 300 mg/hr. Accordingly, this application of analgesia is comparatively safe to the patient.

The several abdominal surgical operations which tested the method demonstrated that the total amount of analgesic needed could vary considerably depending upon the individual patient's needs and also, upon the type of operation performed. For example, in a series of operations, the smallest total amount required was 950 mg. and the largest total amount required was 14,600 mg. In considering these total amounts of analgesic, the time involved in administering the same is also a factor and the times involved in applying the amounts noted varied from 2 to 8 days. Tests demonstrated that the physician could easily effectively regulate the amount of analgesic any patient would need.

Lidocaine is considered to be an effective analgesic with minimal side effects and is rapidly metabolized as it is absorbed into the patient's system. A careful surveillance of the patients tested failed to demonstrate any instance of bradycardia, hypotension or central nervous aberrations. Clearly, the introduction of a small quantity of a mild analgesic to block injured nerves at a point close to the surgical incision appears to be an ideal way to provide effective relief of pain and a tranquil postoperative course of events.

Certain solutions to supplement and to control this application of Lidocaine are desirable and as such, are generally known. To avoid fibronous clotting in the apparatus through which the Lidocaine is applied, it is desirable to add a small amount of aqueous heparin, for example, 50 units of the same per 50 cc bottle of a 1 percent lidocaine solution was found to be adequate, a unit being 0.01 mg.

Other analgesics suitable for this purpose include procaine, commonly known as Novocaine, teracaine and cyclaine. A skilled surgeon will know the toxicities and the effectiveness of these analgesics and also will know his patient sufficiently well as to be able to select a proper analgesic and to use the proper amount of analgesic for a given operation.

FIGS. 1 – 4 exemplify, in a somewhat diagrammatic manner, the nerve system and typical nerve branches which are encountered in abdominal surgery where an incision **20** in the body wall is a vertical incision through the right rectus muscle R adjacent to, but offset a short distance from, the median line of the patient's body. This is a common, preferred type incision for many abdominal operations. The incision line **20** will cut through several right-side thoracic nerves and will cut a lumbar nerve if the incision is to extend to the lower part of the abdomen. As shown at FIG. 1, this nerve system in the abdominal wall forms a ladder-like array of individual nerves which include the sixth through the 12th thoracic nerves indicated at **T6 – T12,** respectively, and also the first lumbar nerve **L1.** Only the right-side nerves are shown, but the left-side thoracic and lumbar nerves present a similar pattern.

A typical thoracic nerve **T9** is diagrammatically indicated at FIG. **2.** The nerve extends from the spinal cord S between vertebrae to lie against the underside of a rib as it extends about the individual's body, and thence downwardly and across the abdomen after emergence from the intercostal space. As indicated, the typical thoracic nerve **T9** has intermediate branches, including one branch at the back of the rib cage and another branch at the side of the rib cage, but the main branch of the nerve extends across the individual's abdominal wall to terminate a short distance beyond the front median line, with the right-side and left-side thoracic

nerves overlapping each other a short distance in this median region.

The terminal portions of the 11th right-side and left-side thoracic nerves, T11 and T11', respectively, are shown in further detail at FIGS. 3 and 4. These thoracic nerves, extend from their respective rib spaces, to lie against fascia of the transversus abdominus muscle 22. Thence, each nerve extends to its respective rectus muscle R entering the fascia to lie upon the inner side of the posterior sheath of this muscle. Traversing its rectus muscle, each opposing nerve, T11 and T11', terminates at the linea alba 23, with respective branches, 24 and 24', extending outward through the superficial fascia to the skin and with other branches 25 and 25', extending inwardly to the peritoneum. It is to be noted that these branches extend across the median line of the individual's body to overlie each other and it follows that should the incision 20 be located close to the median line, the nerve ends of the left thoracic nerve will also be severed by the right-side incision 20, as will be hereinafter discussed further.

Should a surgeon contemplate blocking the thoracic nerves for a surgical operation, he must locate the blockage points according to the extent of the incision to include a proper array of thoracic nerves and, if necessary, the lumbar nerve. The concept of such nerve blocks for surgery is not new, the same being accomplished with a series of spaced injections of an analgesic alongside the critical nerves. However, such a procedure has not been used for postoperative care since repeated groups of injections every few hours are extremely inconvenient and cannot be tolerated.

The present invention avoids the latter objections and provides a novel mode of blocking the critical nerves by implanting a porous tube 30 in the body wall of a patient which will permit either a continuous or intermittent flow of analgesic into the body wall to desensitize the several nerves.

Several tube constructions used in surgery primarily as drainage tubes may be used in the present invention for the introduction of the analgesia into the body wall. The basic properties and features of such a tube are that it be neutral to body tissue, that it be comparatively small in diameter so that it may be threaded into the body wall without undue discomfort, that it be tough, smooth and have substantial tensile strength so that it may be easily pulled from the patient after it has served its purpose and that this tube be porous in the portion where it is inserted into the patient's body wall and non-porous at the portion where it extends from the patient for connection to a dispenser means, such as a syringe for delivering the analgesic to the patient.

A tube suitable for the purpose at hand is exemplified at FIG. 6. This tube 30 is formed of a synthetic resin, such as polyvinyl chloride. Such tubing may be obtained from various surgical supply houses. For example, tubing sold under the designation Tygon may be obtained from Zimmer Company of Warsaw, Ind. The tubing is conventionally used for drainage purposes in a number of various surgical operations. The tubing is very strong, quite supple and pliable and it is ideally suited for the purpose at hand. It is also available in different diameters varying from ⅛-in.-¼-in. This tubing is provided with openings 31 in the side walls, as illustrated at FIG. 6. These openings which permit the tubing to function as an infusion tube may be of various sizes, shapes and patterns and it is a simple matter for a surgeon to obtain from the companies supplying the same, a suitable supply of tubing having the openings located according to any desired pattern. In the present invention, the openings will be located in a tube along one reach which will be embedded into the patient's body when in use. Another portion at one end of the tube will have no openings so that it may be extended from the patient's body for connection with a dispenser means.

This tube must be threaded through a selected course in the body wall of a patient, as hereinafter further described, and a long rigid stylette 40, such as indicated at FIGS. 5 and 6, is provided for this purpose. The stylette will have the same diameter as the tube, a blunted point 41 at one end to facilitate pushing it through body tissue and a threaded stub 42 at the other end which will be tightly fitted into the tube 30 to pull the tube into place as the stylette is extended through and from the patient's body wall. The blunted point 41 is preferably shaped with inclined flat surfaces 43 to produce a wedge-shaped appearance with a leading edge 44 having a form suggestive of a chisel. However, this edge 44 is rounded in all directions as illustrated to provide a smooth, blunted polished edge which will not cut nor crush a nerve or blood vessel it may encounter when being pushed through the patient's body wall, and as such, the side radius of this edge 44 may be selected to be in the range of 1/64th inch to 1/32nd inch to be comparable to the diameter of nerves or blood vessels which may be encountered in using the stylette to more easily push such nerves or blood vessels aside and out of the way, whenever they are encountered, as in the manner suggested at FIG. 8.

The dispensing means for introducing the analgesia into this tube may be a conventional syringe 50, as illustrated at FIG. 7, which has its discharge end modified to form a stub 51 to receive a connective coupling 52 at the end of the tube 30. Also, the dispensing means may be a conventional infusion pump or a conventional drop dispenser 55 which may be mounted above a patient to dispense the analgesic at a continuous slow rate through a tube 56 which connects with the tube 30, as shown at FIG. 11. The dispenser 55 is of the same type which is commonly used for introducing fluids into a patient's blood vessels.

From consideration of the patient's body structure and nerve arrangement at the abdomen, it becomes apparent that the surgeon must select a suitable path in the patient's body wall for proper introduction of the stylette. Since the lumbar and thoracic nerves form a ladder-like array across the patient's abdomen, it was found that one suitable path for location of the infusion tube was near the outer edge of the rectus sheath, but within the sheath as indicated at FIGS. 3 and 4. This location is ideal in many respects. The path of the tube will traverse the group of nerves to be desensitized but will parallel the muscle tissue of the rectus sheath at a location between fascia and muscle tissue where it may be easily guided along the desired course without the necessity of being pushed through intervening fascia, excepting, of course, at the points of insertion into and extension from the body as will be hereinafter described. An alternate location for the infusion tube may be alongside the thoracic nerves in the cleft between internal oblique muscles 21 and the transversus abdominus muscles 22 as indicated in broken lines at 30a

at FIG. 4. Again at this region, the tube may lie between layers of muscle and fascia with a minimum of injury to the tissue.

The location of the infusion tube within a patient's body wall will determine the form and the size of the stylette **40** which must be threaded through the patient's body wall at the selected location, as will be described. It was found that the locations above mentioned, at the edge of the rectus sheath and alongside the oblique and transverse abdominal muscles, would define curved paths which may generally be described as being elliptical. Thus, the stylette will preferably be curved in a similar manner, which may be described as a segment of an ellipse. Preferably, the stylette will have maximum curvature near its point and minimum curvature, more closely approaching a straight portion, at the opposite, connective end of the stylette. However, since the stylette must be threaded completely through the selected course in the patient's body wall, the variation of curvature from one end of the stylette to the other cannot be great. Other uses of the invention, other than for an abdominal operation, are also possible and in each instance considered, it was found that a similar curvature of the stylette was desirable to that above described, although the size of the stylette and the degree of curvature needed would vary with each use and with the size of the patient.

The manner in which the infusion tube is placed into a patient's body with the aid of a stylette is illustrated at FIG. **9** and the manner in which the infusion tube **30** is ultimately positioned in the patient's body is illustrated at FIG. **10.** Before a surgical operation is performed, the surgeon will determine the length and desired location of the infusion tube to be placed in the patient's body wall and select a stylette having suitable curvature for such insertion. The infusion tube, including a reach which is to be extended from the patient's body is secured to the stub **42** of the stylette preparatory to the operation. The surgical operation will proceed in the regular manner and prior to the steps of closing the incision, the infusion tube will be placed in the abdominal wall.

Ordinarily, the stylette will be threaded into the patient's abdominal wall at a point below the incision to parallel the incision and it will emerge from the abdominal wall at a point above the upper end of the incision. Since the point of the stylette is comparatively dull, it cannot penetrate a patient's skin. Thus, the first necessary step is to make a tiny cut **60** with a surgical knife where the stylette is to enter. The stylette is then pushed into position and literally "popped" through the fascia covering the rectus muscle. It is then threaded alongside the rectus muscle, extending upwardly, with the surgeon reaching into the patient's abdomen as indicated at FIG. **9,** or in any other suitable manner to guide the stylette along its selected path. The slightly varying curvature of the stylette enables the surgeon to twist and rotate the stylette a small amount to assist in guiding it to its position. When the point of the stylette reaches the upper terminus of the insertion, the point is turned outwardly and again literally "popped" through the fascia to push against the skin. Since the point of the stylette is easily located as it flexes the skin outwardly, the surgeon may again nick the skin **61** to permit the point of the stylette to extend from the patient's body.

The process is completed by pulling the stylette from the patient's abdominal wall to place the infusion tube at its final selected position. The end of the reach of the porous infusion tube will slip into the abdominal wall, as illustrated in FIG. **10.** The other, non-porous end of the tube **30** is connected to a syringe **50** for intermittent introduction of analgesic or to an extension tube **56** which may be connected to a bottle **55** for continuous introduction of analgesic, as illustrated at FIG. **10.** Subsequent to the steps of placing the tube, an initial dose of analgesic is given and the surgery is then completed by closing the incision in a routine manner.

As the patient recovers, selected amounts of analgesic may be delivered into the infusion tube depending on needs of the patient and thereafter a floor nurse on duty may care for the patient by regulating the rate of analgesic flow depending upon the amount needed to control the postoperative pain in the patient.

The effectiveness of the present invention was demonstrated through a series of operations at the Lutheran Hospital and Medical Center of Wheat Ridge, Col. To provide a basis for comparison, a series of 21 matching abdominal operations were performed by various staff surgeons and each operation required an average of 15.7 doses of injectable narcotics, such as morphine, to control postoperative pain. In contrast, 52 abdominal operations were performed, wherein infusion tubes were applied as disclosed herein, as a supplement to the operations and to control postoperative pain. This supplementary procedure was successful in 51 of the 52 operations and of these, only 4 patients required an injection of a narcotic and of the 4 only one required more than one injection.

Moreover, of the 51 successful operations, no complications ensued as a result of the use of the infusion tube, or tubes, or of the use of the small quantities of the comparatively mild analgesic. These results clearly demonstrate the utility of this method for controlling postoperative pain with mild analgesics.

As heretofore described, the right side and left thoracic nerves overlap each other at the front midline of a patient and in surgical operations close to the midline, there exists the possibility of severing both right side and left side thoracic and lumbar nerves. If this is apt to occur, the use of analgesia at only one side of the patient may be ineffective and two infusion tubes **30** and **30'** must be used as in the manner illustrated at FIG. **11.** Each infusion tube is placed in the abdominal wall of the patient as heretofore described and each tube may receive the analgesic independently if continuous feeding is desired, or through a "V" **35** connecting the tubes to a common source tube **53,** as shown at FIG. **11.**

The invention, in its broader aspect, can include other than abdominal operations. FIG. **12** shows, diagrammatically, the use of a tube **30** placed in a patient's back to desensitize the thoracic nerves. By examination of the pattern of a thoracic nerve, at FIG. **2,** it is seen that another location may be located as at **30***b*. A stylette of similar form, with a curvature essentially the same as described, can be used for this purpose. This particular application is directed toward effectively reducing the postoperative pain of chest surgery where entry must be made through the rib cage.

Yet other applications of analgesia may be advantageously applied to a patient to relieve him of postoperative pain, it being essential for the surgeon to first lo-

cate and map the nerves which will be injured by the surgery and to determine an advantageous location where an infusion tube can be placed into the body of the patient alongside the critical nerves. This generally will be done at the time of the operation and subsequently the postoperative procedure will involve only the infusion of selected amounts of analgesic.

I have now described my invention in considerable detail and it is obvious that others skilled in the art can devise alternate and equivalent components for the same and develop alternate and equivalent sequences and steps. Hence, I desire that my protection be limited not by the construction, sequences and steps described, but only by the proper scope of the appended claims.

I claim:

1. A method for placing the porous section of an infusion tube, having a porous section and a non-porous section, in the body wall of a patient, for applying an analgesic to control postoperative pain where somatic nerves are severed by an incision in the patient's body wall, which includes the steps of:

a. locating the paths of the nerves severed by the incision and selecting a course in the patient's body wall which traverses the severed nerves between the spinal column and the points of severance, which is spaced from the incision in undamaged tissue and which is located between layers of fascia and/or muscle adjacent to the somatic nerves to minimize disruption of body tissue and the amounts of analgesic needed to reach the nerves;

b. implanting the porous section of the infusion tube in the patient's body wall at the selected course and alongside the severed nerves, with the non-porous section of the tube extending from the patient's body wall at one end of the course; and

c. delivering fluid analgesic into the tube whereby the same will flow into the porous section within the patient's body wall and thence to tissue including nerves alongside the porous section of the tube.

2. In the method set forth in claim **1**, wherein:

said course is within the fascia forming the sheath of the rectus muscle.

3. In the method set forth in claim **1**, wherein:

said course is in the cleft between the internal oblique muscles and the transversus abdominus muscles.

4. In the method set forth in claim **1**, wherein the infusion tube is implanted in the patient's body wall by the steps of:

a. connecting one end of the tube to the stub end of a stylette having substantially the same diameter as the external diameter of the tube, a curvature generally correlated with the selected course through the body wall and a length greater than the course by a short distance sufficient to facilitate handling the stylette;

b. inserting the point of the stylette into the patient's body wall at one end of said course, threading the same through the course at a depth which permits the stylette to lie alongside the severed nerves and projecting the point of the stylette from the body wall at the opposite end of the course; and

c. pulling the stylette through the selected course in the patient's body wall whereby to pull the infusion tube into place.

5. In the method defined in claim **1**, wherein the steps of implanting the infusion tube in the patient's body wall are performed during the operation while the incision in the patient's body wall is open, whereby to facilitate guiding the stylette along the selected course by reaching into the incision.

6. In the method defined in claim **5**, including the step of:

nicking the skin of the patient's body wall at the point where threading of the stylette commences and nicking the skin at the patient's body wall at the opposite end of the course where the point of the stylette projects from the patient's body.

7. In the method defined in claim **1**, wherein:

the analgesic is administered by the step of connecting a syringe carrying the analgesic to the tube.

8. In the method defined in claim **1**, wherein:

the analgesic is administered by the step of connecting a bottle containing the analgesic to the tube.

9. A stylette for threading a small diameter infusion tube through a selected distance along a curving course of a patient's body wall such as within the fascia forming the sheath of the rectus muscle and comprising, in combination with the tube:

a. a slender, smooth, rod-like member having a diameter substantially the same as the external diameter of the infusion tube, having a length in excess of the aforesaid selected distance sufficient to handle the stylette while inserting it into the patient's body and a curvature which is generally correlated with the curvature of the patient's body wall along the selected distance;

b. a dulled point at one end of the stylette; and

c. an abutment at the opposite end of the stylette to abut with an end of the tube and a means at this opposite abutment end to securely connect the abutting end of the tube thereto.

10. In the stylette defined in claim **9**, where the curvature is essentially a segment of an elipse with the smaller radius of curvature being at the point end of the same.

11. In the stylette defined in claim **9**, wherein the point is smooth and rounded to minimize the chance of the point piercing or cutting a vein or a nerve.

12. In the stylette defined in claim **9**, wherein:

the point of the stylette is generally chisel-shaped with all edges being rounded at a radius from between 1/64 — 1/32 inch.

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