METHOD AND APPARATUS FOR PLACEMENT OF A SUPRAPUBIC CATHETER

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ABSTRACT

A suprapubic catheter is inserted into a bladder in a safe, efficient and simple manner by first inserting a hollow, curved and rigid tubing member transurethrally into a bladder. The tubing member has a catheter therewithin onto which a cutting point is attached, and is constructed in such a manner as to permit the cutting point to, when pushed through the distal end thereof, pierce the anterior wall of the bladder after it has been externally palpated for placement. The cutting point, then emerging from the bladder, can be grasped externally and the catheter can be pulled through the tubing member and into the bladder to a premarked point thereon and may be separated from the main body of the catheter and connection made to a conventional drainage and collection assembly. The tubing member is then withdrawn backwardly leaving the catheter tube safely within the bladder in the proper position. A stylet may be employed to remove the catheter when drainage is to be terminated.

16 Claims, 5 Drawing Figures
METHOD AND APPARATUS FOR PLACEMENT OF A SUPRAPUBIC CATHETER

BACKGROUND OF THE INVENTION

This invention relates to a method and apparatus for placement of a suprapubic catheter, and more particularly to a method for suprapubic cystotomy wherein the catheter initially pierces the bladder wall from within and is drawn outwardly therefrom for final placement.

Suprapubic catheterization is the insertion into the urinary bladder of a drainage tube through the skin in the lower abdomen above the pubic bone, i.e., the suprapubic area. The procedure is normally carried out by placing a regular transurethral catheter into the bladder and instilling sterile liquid therein until the bladder is sufficiently full that it can be palpated through the skin. This catheter is then removed and the suprapubic catheter is placed into the bladder by one of two means - the trocar method or the needle method.

These methods of insertion can be potentially dangerous unless great care is taken during insertion. Complications often arise due to over-penetration of the "cutting point" into the surrounding bowel or bladder area, since these insertions are made blindly.

Another technique of inserting suprapubic catheters involves inserting a rigid instrument having a curved distal portion that has a clamp thereon into the bladder and depressing the handle of the instrument so as to cause a protrusion on the suprapubic area. An incision is made from without at this point down to the tip of the distal portion of the rigid instrument, which is then brought through the incision. The clamp on the distal end thereof is opened to accept and grasp a catheter, which is then withdrawn backwardly into the bladder. The clamp is released and the catheter is retained within the bladder while the rigid instrument is withdrawn through the urethra. This method of insertion also can produce dangerous complications. For example, whenever a separate incision must be made there is always the attendant possibility of infection. This possibility is further increased in that the distal portion of the rigid instrument is first pushed out into the local environment and exposed to possible contamination and is then drawn back into the bladder and out through the urethra.

Still another prior art suprapubic insertion technique is described in U.S. letters Pat. No. 3,640,281 to Robertson. This technique can be described as including the steps of: inserting a curved distal portion of a rigid instrument into the bladder through the urethra, the curved distal portion having a closure thereon; inflating the bladder with a fluid through the instrument; engaging the distal end of the instrument with the anterior wall of the bladder with sufficient force to provide a visible protrusion of the suprapubic region of the abdominal wall; making an incision through the abdominal wall and the anterior wall of the bladder in register with the distal end of the instrument; displacing same outwardly through the incision, and removing the closure from the distal end of the instrument; inserting a portion of a catheter into the distal end of the instrument; withdrawing the instrument through the incision from the bladder and the urethra, leaving a portion of the catheter within the bladder; and inflating the inflatable portion of the catheter within the bladder to insure retention. This technique, while it appears to be more satisfactory than the others mentioned herein, still has an increased possibility of contamination and infection since the distal portion of the instrument comes up through the bladder and through the externally made incision, is handled at that position from without, and is then withdrawn backwardly through the incision, bladder and urethra.

Accordingly, it is an object of this invention to provide a means of inserting suprapubic catheters that minimizes infection, or the possibility thereof by employing a unidirectional movement of a catheter through the bladder and through the abdomen from within to the external environs.

Another object of this invention is to provide a means of making an incision in the anterior wall of the bladder and the abdominal wall from within the bladder, so as to reduce the possibility of contamination from without.

A further object of the present invention is to provide a method of inserting a suprapubic catheter into the bladder that insures that no portion of the catheter or inserting apparatus must pass from the bladder to the outside and back to the bladder.

SUMMARY OF THE INVENTION

Apparatus for, and a method of, inserting a suprapubic catheter into the bladder is provided in a safe, efficient and simple manner comprising a hollow, curved and rigid tubbing member having a shielded catheter therewithin onto which a cutting point is attached. The tubing member is inserted transurethrally into a bladder in such a manner as to permit the cutting point to, when pushed through the distal end thereof, pierce the wall of the bladder from within after the bladder has been externally palpated. The cutting point, then emerging from the abdomen, is grasped externally and the catheter is pulled through the bladder and abdominal wall, via the tubing member, to a predetermined and premarked point thereon. The curved tubing member can then be easily withdrawn therefrom, leaving the catheter tube safely within the bladder in the proper position. This technique provides a novel and efficient means for inserting suprapubic catheters transurethrally while minimizing the possibility of infection.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the insertion device of this invention;

FIG. 2 is a partial sectional view of the device of this invention being inserted into a patient's bladder transurethrally;

FIG. 3 is a partial sectional view of the cutting point within the device making a puncture from within the bladder;

FIG. 4 is a partial sectional view of a suprapubic catheter in place within the bladder, and the insertion device being withdrawn therefrom; and,

FIG. 5 is a sectional view of the catheter assembly of this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, FIG. 1 shows the device 10 used in this invention to insert a suprapubic catheter into a patient's bladder transurethrally. The device 10 includes a rigid, curved, hollow, tubing member, being curved in such a manner as to permit the member to easily be inserted transurethrally into a patient's bladder. The member is open at both ends, the distal end 11
being the curved portion and having an opening 12 thereon, while the proximal end 13 has an opening 15 thereon and can have a pair of flanging rings 14 or the like attached thereto for holding and guiding the member into the bladder. It should be noted that the rings 14 are added for convenience, and are not necessary parts in this invention.

A catheter 16, such as a spring catheter, having a cutting point 17 thereon, is preloaded in a rigid, hollow plunger 18 having an opening on at least the proximal end thereof. The plunger 18 can advantageously have a ringed configuration, such as shown by 19, situated at the proximal end thereof. The ringed configuration 19 provides a convenient means for handling the plunger 18 and for convolutely storing the catheter 16 there within. Such a ringed arrangement is, of course, preferred but is not necessary. The distal end of the plunger 18 is telescopically placed within the curved member so that when the plunger 18 is pushed all the way into the member the cutting point 17 is capable of extending out through the opening 12 of the curved member.

Referring now to FIGS. 2, 3 and 4, a suprapubic catheter can easily and efficiently be inserted into a patient's bladder 30, by externally palpating the bladder and inserting the device 20, by urethral entry, into the bladder so that the curved distal portion 21 points toward the abdomen and until resistance of the anterior wall of the bladder is felt against the catheter tip 22 having the opening thereon. At this point, an internal to external puncture can be made in the suprapubic region by pushing the plunger 28 inwardly, thereby forcing the cutting point 27 to pierce through the bladder wall 31 and abdominal wall 32 and exiting through the outer surface of the skin. As can be seen from the drawings, the curved distal portion of the insertion device 20 is shaped so that it can easily be inserted through the urethra, and so that the plunger 18 can be handled and operated from a convenient position. The emerging cutting point 27 can then be grasped externally and the catheter 26 can be pulled therethrough to a predetermined and premarked point 41 thereon. The device 20 can then be withdrawn backwardly, as shown in FIG. 4, leaving the suprapubic retention catheter 26 safely within the patient's bladder 30 at the proper level. A stylet can then be employed to remove the catheter when drainage is to be terminated.

The catheter tube can advantageously have a coiled configuration 34 on the end thereof for assisting in the retention of the catheter intracystically. This coiled portion may advantageously have a plurality of openings 35 thereon for facilitating drainage.

Turning finally to FIG. 5, a sectional view of the catheter assembly 10 shows the catheter 16 having a predetermined mark or shoulder 41 which serves a two-fold purpose. The shoulder 41 serves firstly as a means of enabling the plunger 18 to push the catheter 16 out through the opening 12 of the device 10, and secondly, as a marker to show how far the catheter 16 should be pulled out of the patient's bladder. As shown in FIG. 4, the catheter 16 is properly placed when the shoulder 33 becomes visible externally. The catheter assembly should have sufficient compressive strength so that an axial force applied to it from plunger 18 by means of the shoulder portion 41 will be transmitted axially to the cutting point 17 sufficiently to drive the point 17 through an abdominal wall. The catheter 16 is shown here as a semi-rigid vinyl tubing of a relatively heavy wall, but it can be of a variety of materials, such as a more flexible tubing containing a reinforcement such as a bead chain or tightly wound spring running from the shoulder 41 to the cutting point 17.

The cutting point 17 is advantageously a beveled, three sided, electropolished metal point. Other configurations of cutting points should work as well, and excessive cutting action should be avoided which could cause hematuria and clogging of the catheter.

This method of insertion makes a small, clean, pinpoint incision from within the bladder, and does not allow any possible sources of contamination to come into contact with the incision. An obvious advantage of this invention is, of course, that complications that often arise due to over-penetration of the trocar or cutting point into the surrounding bowel area or the like, are completely eliminated, since the cutting point does not come into contact with any body parts until its exact location is precisely known.

While it is preferred that the curved, hollow tubing member and the hollow plunger are of a sturdy metallic material, any rigid, durable material such as an impregnated or reinforced plastic, or the like would work with similar results. The length and diameter of the device should be such that it can be suitably used for human beings, and will vary according to whether it is to be used for male or female patients. The drawings here, of course, show the device being used on female patients. Since it is obvious that many changes and modifications can be made in the above-described details without departing from the nature and spirit of the invention, it is to be understood that the invention is not limited to said details except as set forth in the appended claims.

What is claimed is:

1. A method of placement for a suprapubic catheter comprising:

inserting the distal end of a rigid, hollow tubing member having an opening at both ends thereof through the urethra and into the bladder, said distal end being curved;

locating the opening on said distal end against the anterior wall of the bladder in the suprapubic region thereof;

pushing a cutting point through said tubing member and through said opening on said distal end so as to pierce the anterior wall of the bladder and abdomen in the suprapubic region and through the outer surface of the skin, said cutting point having a catheter attached thereto;

pulling said cutting point outwardly away from said tubing member leaving a portion of said catheter within the bladder; and

withdrawing said tubing member backwardly from said bladder leaving said catheter at the desired position within said bladder.

2. The method of claim 1 wherein said bladder is externally palpated prior to locating said opening on said distal end against the anterior wall of said bladder.

3. The method of claim 1 wherein said catheter is withdrawn from the bladder to a predetermined mark on said catheter.

4. The method of claim 1 wherein said catheter tube has a coiled configuration on the end thereof, and said coiled configuration has a plurality of openings thereon.

5. The method of claim 1 wherein said cutting point is pushed through said distal end of said tubing member
by means of a rigid plunger in telescopic relationship with said tubing member.

6. The method of claim 5 wherein said plunger is hollow and open at at least one end thereof, and said catheter is contained therein prior to insertion into the bladder and abdomen.

7. A device for inserting a suprapubic catheter comprising:

a rigid, hollow, tubing member having a curved distal end portion thereon, said tubing member having an opening at both ends thereof;

a rigid, hollow, metal plunger tube open at at least one end thereof, in which a catheter tube may fit within, is disposed telescopically within said tubing member for pushing a cutting point disposed within said tube outwardly through said distal end portion, said plunger tube has a ringed configuration on the proximal end thereof for holding and guiding said plunging means and for convolutely storing said catheter tube therearound prior to insertion into a bladder, said cutting point having said catheter tube attached thereto.

8. The device of claim 7 wherein said plunger tube is open at both ends.

9. The device of claim 8 wherein said plunger tube and said tubing member are of a metal.

10. The device of claim 8 wherein said plunging means and said tubing member are of a reinforced plastic material.

11. The device of claim 10 wherein said tubing member has a pair of flanging rings on the proximal end thereof for holding and guiding said tubing member.

12. The device of claim 7 wherein said catheter tube has a coiled configuration on the end thereof for retaining said tube intracystically, and said coiled configuration has a plurality of openings thereon.

13. The device of claim 12 wherein said catheter tube is marked to show the proper level for positioning said tube within the bladder.

14. The device of claim 13 wherein said mark on said tube is a shouldered portion that also serves as an engaging means for enabling said plunger tube to push said catheter out of said tubing member.

15. The device of claim 13 wherein said cutting point is a beveled, three-sided, electropolished needle.

16. A device for inserting a suprapubic catheter comprising:

a rigid, hollow, metal tubing member having a curved distal end portion thereon, said tubing member having an opening at both ends thereof, and having a pair of flanging rings on the proximal end thereof, and,

a rigid, hollow, metal plunger tube, being open at at least one end thereof, and having a ringed configuration on the proximal end thereof, disposed telescopically within said tubing member for pushing a cutting point disposed within said tubing member outwardly through said distal end portion thereof, said cutting point being a beveled, three-sided, electropolished needle and having a catheter tube attached thereto, said tube having a coiled configuration on the end thereof and a plurality of openings thereon, and said tube has a mark thereon for properly positioning said tube within the bladder.