

Aug. 26, 1958

V. J. ODDO
HAEMOSTATIC CATHETER

2,849,001

Filed Oct. 17, 1955

2 Sheets-Sheet 1

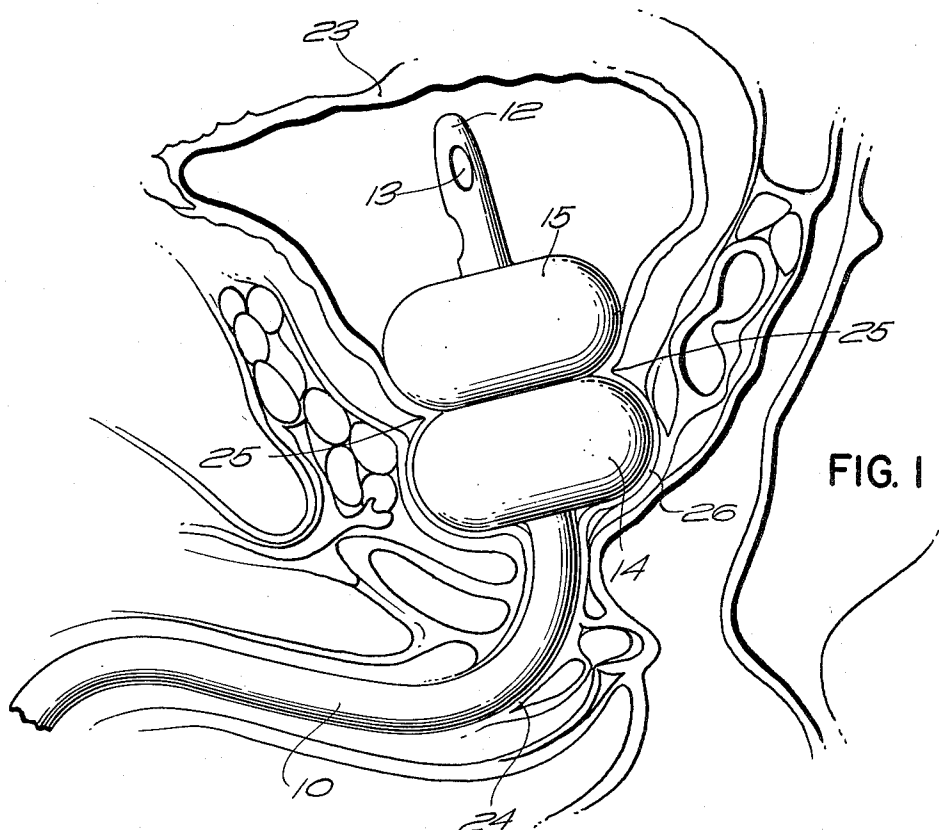


FIG. 1

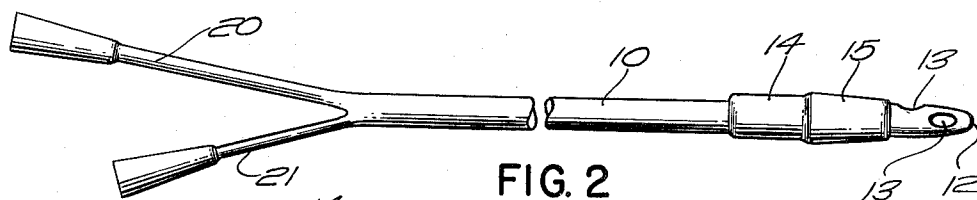


FIG. 2

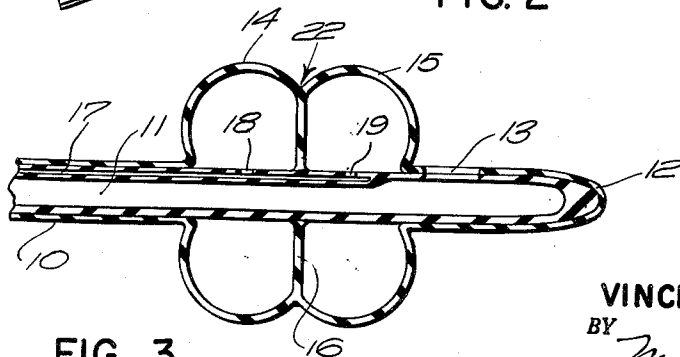


FIG. 3

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2 Sheets-Sheet 2

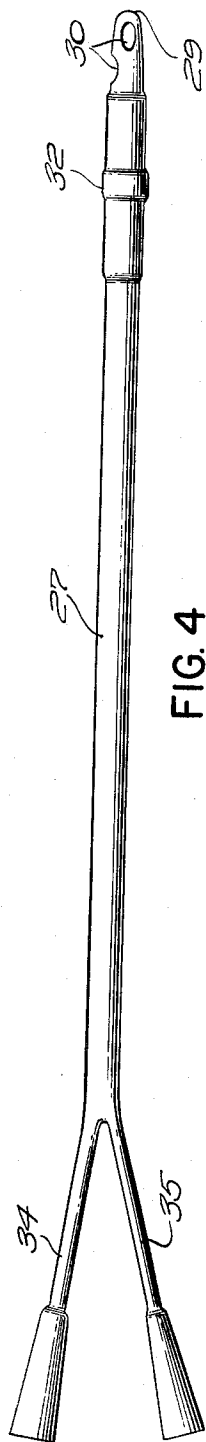


FIG. 4

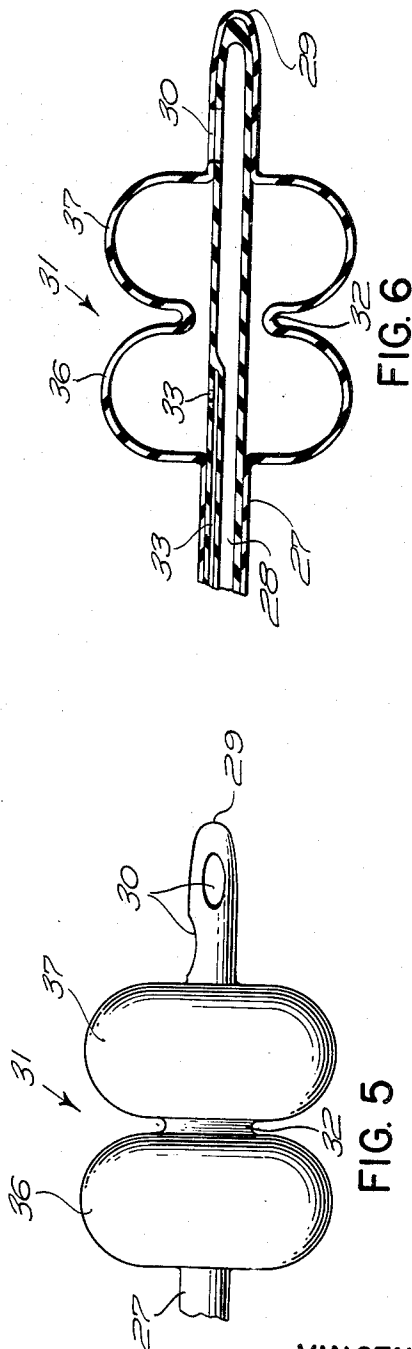


FIG. 6

FIG. 5

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2,849,001

HAEMOSTATIC CATHETER

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Application October 17, 1955, Serial No. 540,674

7 Claims. (Cl. 128—325)

My present invention relates to a surgical appliance, and more particularly to a haemostatic catheter.

The present invention constitutes an improvement over my copending application entitled "Haemostatic Catheter," filed March 22, 1955, Serial No. 495,845, now Patent No. 2,799,273.

The principal object of the present invention is to provide a catheter which can be used for stopping or checking bleeding in certain types of operations.

Another object of the present invention is to provide a catheter particularly adaptable to check bleeding after a prostatectomy has been performed.

A further object of the present invention is to provide a catheter which will apply pressure to the affected areas and check or stop bleeding immediately.

Another object of the present invention is to provide a haemostatic catheter that can also be used as a conventional drainage catheter.

With the above and other objects and advantageous features in view, my invention consists of a novel arrangement of parts, more fully disclosed in the detailed description following, in conjunction with the accompanying drawings, and more specifically defined in the appended claims.

In the drawings:

Fig. 1 is an enlarged view of the bladder and urethra with the catheter of the present invention in place.

Fig. 2 is a side elevation of the catheter.

Fig. 3 is an enlarged longitudinal section of the distal end with the balloons inflated.

Fig. 4 is a side elevation of another form of catheter embodying my invention.

Fig. 5 is an enlarged view of the distal end with the balloons inflated.

Fig. 6 is a longitudinal section of the portion shown in Fig. 5.

In certain types of operations there is a great deal of post operative bleeding which is difficult to check. More particularly, an operation for the removal of the prostate gland results in bleeding in the prostatic bed and the vesical neck. This is true regardless of the technique or method used in removing the gland. A conventional method of attempting to stop the bleeding is by inserting a balloon catheter, inflating the balloon in the bladder and pulling outwardly. This applies some pressure to the lower portion of the bladder and the upper portion of the vesical neck. But there is no pressure on the prostatic bed or the inferior portion of the vesical neck. Therefore the bleeding will usually continue for about one or two days or longer with the result that the patient becomes very weak.

In my copending application herein referred to, I have provided a construction designed to provide pressure in the prostatic bed and above and below the vesical neck. However, I have found that this is still insufficient to obtain the optimum results. Since most of the bleeding occurs at the vesical neck, it is essential that direct pressure be brought to bear upon it. The present invention

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provides a catheter construction which produces pressure on the prostatic bed, pressure in the bladder on the upper end of the vesical neck, and a direct pressure on the vesical neck.

Referring more in detail to the drawings illustrating my invention, Figs. 2 and 3 illustrate the construction of a catheter embodying one form of my invention. While any type of material and construction may be used, I prefer that the catheter be made in an integral one piece construction of flexible rubber. The catheter comprises a tubular body portion 10 having a central drainage channel 11 which is closed at the distal end 12. The body portion 10 is provided with one or more openings 13 adjacent the distal end 12 and communicating with the channel 11. Integrally mounted on the body portion 10 and spaced from the distal end is an inflatable balloon portion 14. Mounted on the tubular body 10 adjacent the balloon 14 is a second balloon 15 of the same size, shape and capacity. However, the balloon 15 terminates at the adjacent wall 16 of the balloon 14 and merges therewith so that the wall 16 forms a common wall for the two balloons.

An inflating duct 17 is embedded or formed in the wall of the tubular portion 10 and is provided with an opening 18 communicating with the balloon 14 and an opening 19 communicating with the balloon 15. The rear end of the catheter is bifurcated as shown in Fig. 2, the funnel portion 20 communicating with the drainage channel 11 and the funnel portion 21 communicating with the inflating duct 17. It is preferable that the balloons 14 and 15 be shaped as illustrated in a general torus shape having bulging ends so that the common wall portion 16 forms an indentation 22 extending around the catheter. With this construction air or water pumped into the duct 17 will simultaneously inflate both balloons into the position shown in Fig. 3.

The particular application of the above construction is a haemostatic catheter as illustrated in Fig. 1. The general area of the lower male pelvic region comprises a bladder 23, an urethra 24, and a vesical neck 25 which provides the muscular control between the bladder and the urethra. As illustrated in my copending application, the prostate gland is of generally conical shape and surrounds the urethra just below the vesical neck 25. It is generally enclosed in a bed or sheath 26 comprising the peri-prostatic tissues. There are several methods of removing the prostate gland. One method is to cut through the front wall of the abdomen and through the wall of the bladder 23. The surgeon then inserts his finger through the vesical neck 25 and peels the prostate gland away from the tissues 26 and removes it. Another method is to make an incision from underneath through the perineum and remove the prostate gland from that direction. In both cases the portion of the urethra which is surrounded by the prostate gland is also torn out. There is thus considerable bleeding at the vesical neck 25 and in the entire surface of the tissues 26.

Referring to Fig. 1, the catheter is inserted through the urethra 24 so that the distal end 12 extends into the bladder 23. The catheter is so positioned that the balloon 15 is also within the bladder and the balloon 14 is below the vesical neck. Both balloons are now simultaneously inflated through the duct 17. As can readily be seen, the balloon 15 will inflate in the bladder 23 and press against the upper end of the vesical neck 25. The balloon 14 will completely fill the cavity formed by the tissues 26 from which the prostate gland was removed and exert a pressure on the walls of the cavity as well as the underside of the vesical neck 25. The indented portion 22, formed by the common balloon wall 16 will also be pulled upwardly and will exert a direct pressure on the vesical neck 25. Thus with the balloons inflated direct pressure is brought

to bear at every point of bleeding and especially against the vesical neck where most of the bleeding occurs. The catheter is locked in place by the inflated balloons and the bladder 23 drains through the openings 13 and the drainage channel 11 in the usual manner. It should be noted that the tissues 26 and muscles will shrink and organize to form a new urethral passageway. However, at this time the area is enlarged and pliable and will take the shape of the balloon 14 as it is inflated. Although a single duct inflates both balloons simultaneously it is preferable that the capacity of each balloon be the same as for a separate inflatable balloon. For example, if the surgeon desires a 30 cc. balloon then each balloon 14 and 15 should have this capacity so that actually 60 cc. of liquid would have to be pumped in to inflate the balloons. It is also desirable that the distance from the distal end 12 to the far side (left wall in Fig. 3) of the balloon 14 be equal to the same distance in a single balloon catheter. This permits the catheter of the present invention to be used in a conventional manner as a drainage catheter.

In removing the prostate gland many veins and arteries are torn and ruptured and there is great danger of bleeding and shock following a prostate operation. The catheter of the present invention is designed to check and prevent these complications. The bleeding is checked almost immediately and the healing is more rapid.

The catheter of the present invention may also be used in other types of operations. For example, in certain lung operations the chest cavity is pierced and drained. A conventional catheter with one balloon is inserted. However, such catheters must be taped so that they will not fall into the chest cavity. The catheter of the present invention can be positioned so that one balloon will inflate inside the cavity and the second one outside the chest. The catheter will then be immovably positioned and will not move either in or out. Furthermore, the pressure between the two balloons will prevent any extraneous leakage and all drainage will be through the catheter.

The basic concept in the present invention is the application of direct pressure on the vesical neck in addition to the pressure exerted in the prostatic bed. Another construction accomplishing the same result is shown in Figs. 4, 5 and 6. In this form, the body of the catheter 27 is also provided with a central drainage channel 28 closed at the distal end 29. Openings 30 adjacent the distal end 29 communicate with the drainage channel 28. Spaced from the distal end 29, an inflatable balloon 31 is integrally mounted around the body portion 27. The balloon 31 extends along the body portion for a distance equivalent to two conventional balloons. The central perimeter of the balloon 31 is provided with a thickened strip 32 which may be a separate strip or may be formed integrally with the balloon. Embedded or formed in the wall of the body portion 27 is an inflation duct 33 communicating with the balloon 31. The proximal end of the catheter is bifurcated, the funnel portion 34 communicating with the drainage channel 28, and the funnel portion 35 communicating with the inflation duct 33.

As water or air is forced through the inflation duct 33, the balloon 31 will inflate. However, the strip portion 32, being thicker, will inflate to a much lesser degree, causing the balloon 31 to form two balloon portions 36 and 37. It can readily be seen that this construction can be used similarly to the form shown in Figs. 1, 2 and 3. By positioning the catheter so that the balloon portion 37 is in the bladder and the balloon portion 36 in the prostatic bed, pressure is provided not only in these areas, but the central strip portion 32 will exert a direct pressure on the vesical neck.

In either form, the bleeding is checked or stopped immediately by direct pressures on the affected parts, and more particularly on the vesical neck. The catheters are simple in construction and easy to use, either as a haemostatic or as a drainage catheter. Other advantages will be readily apparent to a person skilled in the art.

I claim:

1. A surgical accessory comprising an elongated tubular body portion having a central longitudinal drainage channel closed at the distal end, a drainage opening in said body portion adjacent the distal end and communicating with said drainage channel, an inflatable balloon portion on said body portion adjacent the drainage opening, said balloon portion comprising a pair of torus shaped balloons in contiguous relation having a common integral wall therebetween, and inflation channel means in said body portion communicating with said balloons.

2. A surgical accessory comprising an elongated tubular body portion having a central longitudinal drainage channel closed at the distal end, a drainage opening in said body portion adjacent the distal end and communicating with said drainage channel, an inflatable balloon portion on said body portion adjacent the drainage opening, said balloon portion comprising a pair of torus shaped balloons in contiguous relation having a common integral wall therebetween, said body portion having an inflation channel for simultaneously inflating said balloons, and separate conduits at the proximal end of said body portion for said drainage channel and said inflation channel.

3. A surgical accessory comprising an elongated tubular flexible rubber body portion having a central longitudinal drainage channel closed at the distal end, a drainage opening in said body portion adjacent the distal end and communicating with said drainage channel, an inflatable balloon on said body portion adjacent the drainage opening, said balloon having a central peripheral thickened portion dividing said balloon into two balloon portions adapted to inflate to a greater degree than said central thickened portion, said body portion having an inflation channel for inflating said balloon, and separate conduits at the proximal end of said body portion for said drainage channel and said inflation channel.

4. A haemostatic catheter for stopping bleeding in the vesical neck and in the prostate bed after a prostatectomy, said catheter comprising a tubular body portion adapted to extend through the urethra and vesical neck to a point within the bladder, the walls of said body portion having an opening adjacent the distal end, and inflatable means on said body portion for applying a direct pressure to the walls of the prostate bed, to the vesical neck and to the upper and lower surfaces of the vesical neck, said inflatable means comprising a pair of adjacent inflatable portions having a common wall therebetween, said catheter having an integral one-piece construction and being flexible throughout.

5. A haemostatic catheter for stopping bleeding in the vesical neck and in the prostate bed after a prostatectomy, said catheter comprising an elongated tubular body portion adapted to extend through the urethra and vesical neck to a point within the bladder, an inflatable balloon portion encircling said body portion at a point adjacent the distal end, said balloon portion comprising a pair of adjacent inflatable portions having a common wall therebetween, one inflatable portion being adapted to be positioned within the bladder and exerting a haemostatic pressure on the bottom of the bladder and the top of the vesical neck, the other inflatable portion being adapted to be positioned within the prostate bed and exerting a haemostatic pressure on the bottom of the vesical neck and the walls of the prostate bed, said common wall being positioned in the vesical neck and exerting a direct pressure on the vesical neck, the walls of said catheter having a plurality of drainage openings distal to said balloon portion, an inflating duct extending longitudinally through the walls of said body portion communicating with said inflatable portions, and a separate tubular extension at the proximal end of said body portion for said body portion and said inflating duct, said catheter having an integral one-piece flexible rubber construction.

6. A haemostatic catheter for stopping bleeding in the

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vesical neck and in the prostate bed after a prostatectomy, said catheter comprising an elongated tubular body portion adapted to extend through the urethra and vesical neck to a point within the bladder, an inflatable balloon portion encircling said body portion at a point adjacent the distal end, said balloon portion comprising an inflatable balloon having a central peripheral thickened portion dividing said balloon into two balloon portions adapted to inflate to a greater degree than said thickened portion, one balloon portion being adapted to be positioned within the bladder and exerting a haemostatic pressure on the bottom of the bladder and the top of the vesical neck, the other balloon portion being adapted to be positioned within the prostate bed and exerting a haemostatic pressure on the bottom of the vesical neck and the walls of the prostate bed, and said thickened portion being positioned in the vesical neck and exerting a direct haemostatic pressure on the vesical neck, the walls of said catheter having a plurality of drainage openings distal to said balloon portion, an inflating duct extending longitudinally through the wall of said body portion and communicating with said balloon portion, and a separate tubular extension at the proximal end of

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said body portion for said body portion and said inflating duct, said catheter having an integral one-piece flexible rubber construction.

7. A haemostatic catheter for stopping bleeding in the vesical neck and in the prostate bed after a prostatectomy, said catheter comprising a tubular body portion adapted to extend through the urethra and vesical neck to a point within the bladder, the walls of said body portion having an opening adjacent the distal end, and inflatable means on said body portion for applying a direct pressure to the walls of the prostate bed, to the vesical neck, and to the upper and lower surfaces of the vesical neck, said inflatable means comprising a pair of adjacent inflatable portions joined by an integral portion therebetween, said catheter having an integral one-piece construction and being flexible throughout.

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