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SURGICAL DEVICE FOR CORRECTION OF URINARY INCONTINENCE

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Fig. 1.

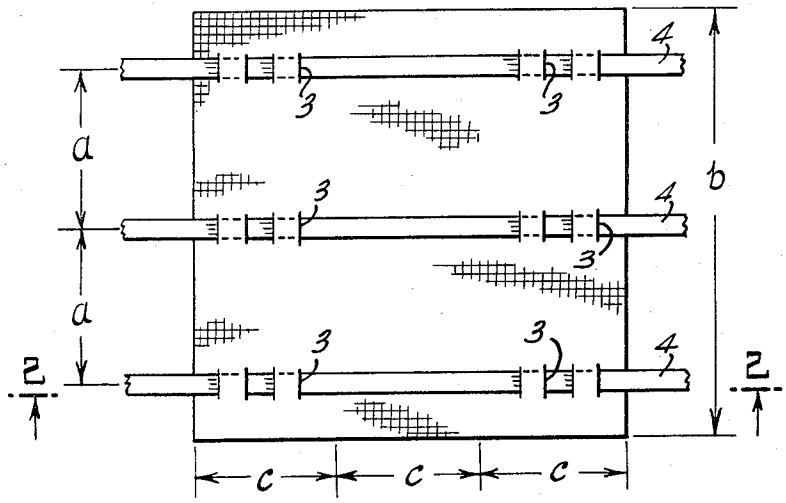



Fig. 2.

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# SURGICAL DEVICE FOR CORRECTION OF URINARY INCONTINENCE

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1 Claim. (Cl. 128—1)

The present invention relates to: collagen prosthesis, and more particularly to a device useful in correcting urinary incontinence.

Urinary incontinence in the male frequently results from a prostatectomy and has always been a most difficult problem to handle. The bladder is devoid of sphincter action and the retention of urine with overflow incontinence is present in most instances.

It is an object of the present invention therefore to provide a prosthesis that may be used to correct urinary incontinence.

The prosthesis of the present invention will appear more clearly from the following descriptions when taken in connection with the accompanying drawings which show by way of example a preferred embodiment of the inventive idea.

Referring now to the drawings:

FIGURE 1 is a plan view of the prosthesis of the present invention.

FIG. 2 is a sectional view of the prosthesis taken on the line 2—2 of FIG. 1.

The prosthesis illustrated in FIG. 1 is a woven collagen fabric. The warp yarns may be an extruded collagen multifilament or monofilament strands obtained by the procedure described U.S. Patent No. 3,114,593. The weft yarns are also collagen multifilament or monofilament. A number of cuts 3 may be made in the fabric parallel either to the warp yarns or to the weft yarns. These cuts are in alignment to permit the collagen tape 4 having a width slightly less than the width of the cut 3 to be laced therethrough. When the collagen tapes are in position they may be moved in a longitudinal direction with respect to the fabric but are restrained from lateral movement.

The collagen tape may be an extruded tape of the type described in U.S. Patent No. 3,114,372.

To avoid cutting the collagen fabric the fabric may be woven around the collagen tapes 4 or alternatively the fabric may be patternly woven to provide the openings 3 aligned in rank and file to permit lacing therethrough sections of collagen tape 4.

The fabric of the present invention has an open weave (about 15 threads to the inch) and may be generally square in shape. The dimension *b* may conveniently be 3 centimeters. The dimension *a* may be 0.7 centimeter and the dimension *c* may be about 1 centimeter. Since the openings 3 are made wider in the tape 4 the surgeon may remove the tape from the fabric and cut the fabric to any desired size and shape. The tapes may then be reinserted in the openings 3.

The collagen fabric and tapes may be tanned to decrease



the rate of absorption in the human body. Suitable tanning bath for this purpose may contain 1.2% $Cr_2O_3$, 0.3% pyrogallol, 0.2% formaldehyde, and have a pH of 3.2. The fabric with the tape in place is immersed in this bath for 3 minutes, and dried for 3 minutes in a current of air heated to 100° F. It is then sterilized and packaged in sterile condition.

It is an advantage of the collagen prosthesis described above that it is absorbed and yet will provide wide strength and support for the membranous urethra. Other advantages of this device are that it encourages the growth of connective tissue around the membranous urethra and maintains a fixed position during the growth of this connective tissue.

The surgical technique for using the device of the present invention has been developed by Drs. R. Veenema and A. Girgis at Columbia University. In use, the collagen prosthesis is passed anterior to the bulbar urethra through a perineal approach, the collagen fabric is wrapped around the membranous urethra throughout its entire length and the terminal ends of the collagen tapes are sutured through the levator ani muscles which then function as a new urinary sphincter to the angulated urethra.

The open weave collagen fabric will encourage and permit the growth of connective tissue around the urethra and will gradually be absorbed and replaced by this connective tissue. The multiplicity of tapes are for the purpose of fixing the device in place and to exert tension backwards and downwards, on the urethra by their attachment to the lateral extensions of the levator ani muscles. These tapes are absorbed at approximately the same rate as the collagen fabric and will disappear when no longer needed.

What is claimed is:

1. A surgical prosthesis useful in the surgical correction of urinary incontinence comprising a woven collagen fabric having several rows of slit-like openings extending across said fabric, the openings in each row being in alignment with each other and parallel to one set of threads forming the fabric; a plurality of collagen tapes, each having a length substantially greater than the distance across said fabric, each of said tapes being laced through the openings in one of said rows, whereby the tapes are parallel to each other and may be moved in a direction parallel to said rows but are restrained from lateral movement

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