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## THE CORRECTION OF STRESS INCONTINENCE BY SIMPLE VESICourethRAL SUSPENSION

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A PROCEDURE for the correction of urinary stress incontinence has been devised which has given results approximating and often surpassing those which follow the commonly used operations. A description of this new attack upon an old problem is given as well as an account of a test devised to facilitate the selection of cases in which the outcome of treatment is likely to be successful. This procedure has been carried out on 50 patients to date. Thirty-eight cases were of the usual variety of stress incontinence in females and 25 of these had previously had a total of 40 standard gynecological operations without relief of this distressing condition. The remaining 12 patients were treated for unsatisfactory urinary control due to a variety of causes.

The basic plan of this procedure was derived from a study of vesical dysfunction following removal of the rectum (11). A high incidence of disturbance in the lower urinary tract, chiefly retention, followed excision of the rectum by either the abdominoperineal approach or the perineal route alone, yet the incidence was low following operations omitting the perineal dissection. Traditionally this dysfunction has been ascribed to damage of nerves, but in this study no specifically neurological change could be demonstrated. Furthermore, transurethral revision of the vesical outlet in those patients having persistent retention after perineal rectal removal provided more satisfactory results than are usually obtained in instances of established neurogenic bladder. On the other hand, transurethral resection after rectal excision was less satisfactory than in cases of simple prostatism. Accordingly, it seemed apparent that a major factor producing retention after peri-

neal excisions existed which was not neurological and which was not pure prostatism. An observation that most of the patients with this complication had mobility and marked sagging of the vesical base and outlet suggested that lack of elevation and fixation might be this unrecognized factor. In some cases firm upward pressure on the perineum with a fist or harness would provide temporary elevation and fixation and these patients could thereby void satisfactorily. In fact one patient declined transurethral surgery when he found that perineal support on voiding permitted emptying and relieved overflow incontinence. From time to time mysterious cases appeared in which, after removal of the rectum, a transurethral prostatectomy relieved retention only to result in incontinence! Finally, the following case seemed to integrate these observations and suggestions:

L. W., M. H. history No. 70735, a 54 year old male, had complete urinary retention following abdominoperineal removal of the rectum. Neurological changes in the urinary apparatus could not be demonstrated. Two transurethral resections resulted in total incontinence even though the external urethral sphincter had not been damaged. Perineal pressure would provide good control. Simple suprapubic suspension of the vesical outlet by suturing to the pubis immediately and completely corrected his urinary control which has remained normal for a period of 46 months.

By analogy, the knowledge gained from the study of these rectal cases was applied to the problem of the common stress incontinence of females. A simple operative elevation and fixation via the suprapubic route was planned; but first a prognostic test was devised, based particularly upon the observations regarding sagging of the vesical outlet and the effect of perineal pressure. This test provides simple temporary elevation and fixation of the vesical outlet as an evaluation for each case considered for operation. Its value was promptly appreciated because a successful result from

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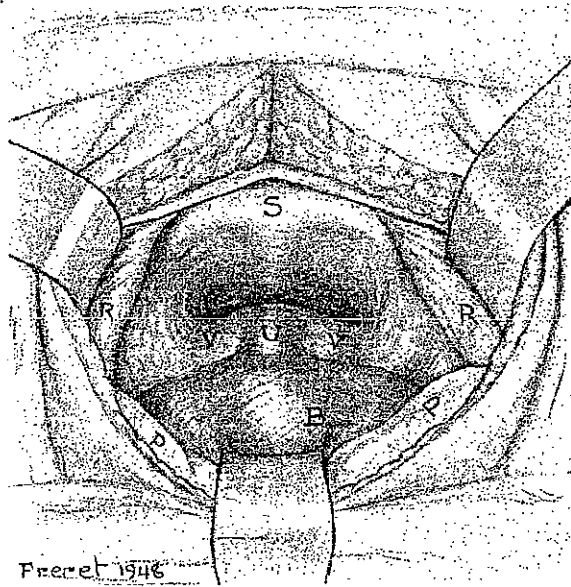


Fig. 1. Operative area exposed and urethra, *U*, separated from symphysis, *S*. *R*, rectus muscles; *B*, bladder; *P*, peritoneum; *V*, upper surface of vagina.

the new operation was rarely obtained if the preoperative test was unfavorable. Furthermore, the cause of some failures following the suspension and standard operations for incontinence can be revealed by this trial procedure.

The test was made by filling the bladder with 250 cubic centimeters of saline and observing the patient's urinary control while coughing and straining in the prone and standing positions. After the bladder was refilled to 250 cubic centimeters the same procedures were repeated with the exception that elevation and fixation of the vesical outlet was provided in the following manner: A wheel of novocain which was made in the vaginal wall at a point estimated to be under the interureteric ridge was grasped with an Allis clamp and held firmly upward toward the umbilicus, not permitting downward movement on coughing and straining. If this elevation and fixation provided good urinary control, the test was considered favorable. As accessory evidence, pulling the vesical base downward toward the introitus caused poorer control. Use of the clamp attached to the wheel was more accurate than providing the support with a finger because the examiner

could be more certain that control was not afforded merely by compression of the urethra or vesical neck. Actually a finger just anterior to the cervix can provide the elevation and fixation without compression of the outlet if carefully done. Pressing the rectum posteriorly usually made control worse. Having the patient stop and start the urinary stream while the upward immobilization was maintained would indicate by the caliber of the stream whether or not the lumen of the outlet was constricted, as well as further indicating the degree of control obtained.

The first female patient (I. B., M. H. history number 58436) selected for simple suprapubic elevation and immobilization of the vesical neck and urethra was 51 years old, complaining of constant painless leakage of urine from the urethra for 2 years, except when in bed. Even though pads were worn constantly, she was required to change her clothing at least twice daily. A mild cystourethrocele was present. Urinalysis and cystoendoscopy were unremarkable. No psychiatric nor psychosomatic disorder was evident. The previously described test was favorable.

On June 8, 1944, under general anesthesia, the following operation was performed and the technique has not been altered essentially in subsequent cases. A No. 24 F. Foley catheter with a 30 cubic centimeter balloon was placed into the bladder transurethrally and the bag inflated. The patient was arranged in Trendelenburg position with emphasis on the elevation of the pelvis proper rather than merely lowering the head of the table and bending the knees downward (19). A suprapubic incision was made to expose the space of Retzius widely. Light pressure on the top of the bladder and the urethra with a sponge on ring forceps readily separated the bladder and urethra from the posterior surface of the pubis and rectus muscles down to 1 centimeter or less of the external urethral meatus. The suspensory attachments between these structures were extremely delicate, bearing only the faintest resemblance to the tough puboprostatic ligaments of the normal male. An assistant's fingers in the vagina aided the palpation of the catheter and balloon which corresponded to the urethra and vesical neck, respectively. Three sutures of No. 1 chromic catgut were placed equidistant from each other on either side of the urethra. The su-

turing needle was inserted deeply into the upper wall of the vagina adjacent to the urethra and through the lateral wall of the urethra, caution being exercised to avoid entering the urethral lumen. A double bite was taken to insure a secure hold and also to place eventually as large an amount of tissue as possible in apposition to the pubis. A similar suture was then placed on either side of the vesical outlet, in the angle between the balloon and the catheter after the balloon had been pulled down to mark the outlet. When upward traction was made on the long ends of these eight sutures, the urethra and vesical neck were lifted away from the introitus, which change was particularly noticeable by the assistant who had two fingers in the vagina. At this stage additional sutures were placed at points of advantage lateral to the urethra where the vaginal wall apparently sagged: that is, one additional suture on each side, but the number has varied according to circumstances in subsequent cases. With a curved, round-edged needle the long ends of these sutures were placed securely through the periosteum of the pubis, especially into the cartilage of the symphysis whenever feasible. The locations for these sutures in the pubis, or rectus muscles when indicated, were carefully selected in order that when the sutures were tied they would move the urinary passage upward and backward from the introitus. Upward displacement by the assistant's fingers in the vagina aided the selection of these sites and avoided undesirable tension until a sufficient number of the sutures had been tied. Thus, the space of Retzius was closed and a wide area of the superior surface of the urethra and vesical neck opposed to the symphysis and the posterior surfaces of the rectus muscles. Additional sutures were now placed in the musculature of the lower and lateral portions of the bladder with their long ends in the posterior parts of the rectus muscles and tied to further pull the bladder anteriorly into the space of Retzius. One small rubber drain was inserted in the wound for the same reason that chromic catgut sutures were used instead of silk: namely, better to protect the field of operation should urinary leakage occur as a result of any of the sutures having

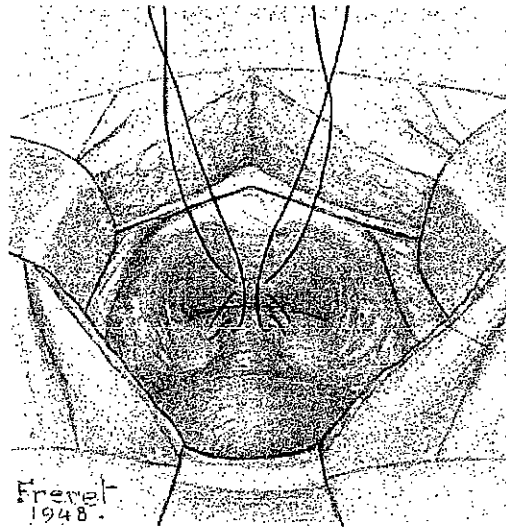


Fig. 2. Lowest suture on either side in place.

penetrated the urinary lumen. The abdominal wound was closed in a routine manner.

Inspection following the procedure revealed no cystourethrocele and only the barest motion of the urethra on straining. With the patient lying horizontally, the long axis of the urethra was close to a 45 degree angle with the floor instead of parallel as before the operation. The external urethral meatus appeared retracted inward and upward. The Foley catheter was attached to the thigh by adhesive tape in order to absorb any accidental traction contrary to the purposes of the operation. The urine contained gross blood for 2 days after operation. The drain was removed on the second postoperative day and the catheter on the seventh.

In the 34 months following operation this patient has not worn a perineal pad or other protection and has not been incontinent. She has worked moving office files without urinary incontinence and can safely cough and sneeze. In addition, there has been no recurrence of the cystocele. The urinary stream is of large caliber and forceful. Two hundred fifty cubic centimeters of water placed in the bladder is retained and voided normally without leaving any residual. She voids on the average of five times a day and occasionally once at night.

In selecting additional candidates for this operation, the value of the previously described test was not only emphasized, but certain other conditions frequently required exclusion by specific measures. When stress

incontinence coexisted with other diseases which may cause urinary dysfunction, the differentiation of the degree of trouble attributable to each disorder separately was often difficult. The commonest disease confused and coexistent with stress incontinence was chronic nonspecific urethritis with or without cystoscopically observable trigonitis. This frequent coexistence of incontinence and urethritis suggested that their relationship was etiologically more than fortuitous, particularly as the correction of one often decreased the symptoms due to the other. Generally speaking, the urethral irritation was the more easily treated of the two. Those patients with urethritis as the major factor producing their complaint were usually found, on careful questioning and observation, to have marked urgency and frequency rather than actual loss of the mechanics of retention. They had the desire to void, which might be sudden and irresistible, and then wet themselves. They, however, had some warning. The truly incontinent patients would wet themselves without warning (except as only experience might have taught them that certain activities usually caused leaking). A therapeutic trial of slowly progressive urethral dilations to open the ducts of the urethral glands, followed by instillations into the bladder and urethra of 1:5000 silver nitrate at weekly intervals, and accompanied by two sitz baths daily of 15 minutes each, usually produced marked improvement by the second or third week if urethritis was a major factor causing symptoms. The source of such urethral infection was sometimes evident in the vagina, cervix, periurethral ducts and glands or in a urethral caruncle. Correction of these disorders, when they existed, was occasionally of paramount importance. Other more generally recognized causes of cystitis or urethritis were excluded, particularly if the urinalysis was abnormal: tuberculosis, neoplasms, urethral obstructions, fistulas, renal infections, etc. Hunner's ulcer usually produced a characteristic history of pain with bladder distention, and cystoscopy established that diagnosis. Fully developed neurogenic bladders were usually suspected from the history and general examination, but in the incipient stages

the differentiation from non-neurogenic incontinence was difficult. Occasionally, females were found to have large residual urines and thereby overflow or paradoxical incontinence—not a weakness of the retaining mechanism. Cystoendoscopy, trial therapy for urethritis, a simple neurological examination, complete urinalysis, estimation of renal function, and finally the inquiry into the patient's psychological reactions seemed important in the selection of candidates for this new operation in addition to the described test. It will be pointed out later that some of our failures can be attributed to poor selection rather than to the operation itself which is not designed to cure all types of incontinence.

Following the first 2 cases just described an additional 48 patients, 4 male and 44 female, have been operated upon. They had various lesions causing poor urinary control and various bases for selection. The results have been excellent in 32 of the total number of 50 patients; good but not excellent, in 6; improved but not satisfactory, in 3; failures, in 9; but none had worse control than before operation. This gross tabulation does not present the true value of the method, though it does indicate the existence of limitations. If the results for those cases preoperatively selected as favorable by the advised study are tabulated, the effectiveness of the procedure is apparent: of 44 so selected, 36 (82%) are excellent results; 3 (7%) are improved; and 5 (11%) are failures at the time of this writing. Furthermore, the reason for not obtaining excellent results is obvious in 4: sutures insecurely placed (the first attempt of an operator not familiar with the details of the procedure); excessive scarring which did not permit elevation by the suprapubic route alone, due to lymphogranuloma in 1 case, and due to previous surgery with infection in another; and, wound infection. The cause of a fifth incomplete result is uncertain. The patient stated she was greatly improved when seen in our follow-up clinic; but when seen later outside the hospital said she still leaked, and she will not return to the clinic for evaluation. After leaving the hospital 3 patients' control became weak from cause unknown

except in 2 of these a partial recurrence followed unusual straining.

The largest single group in the series is perhaps the most important, not only because the best results were obtained, but also because it represents the commonest variety of incontinence. The group consists of 38 female patients having the common variety of so called stress incontinence: that is, the type generally recognized as being due to relaxation, especially following deliveries or the endocrine changes of aging; the variety considered suitable for such standard operations as those devised by Kelly, Kennedy, Aldridge, Studdiford, and others. Furthermore, 25 (66%) of the patients in this group had had 40 standard gynecological operations of types which are recognized to provide good control routinely, but which had failed in these cases. Twenty-nine (76%) of these 38 patients had control so poor that urine leaked out of the urethra even while in bed or leakage was so constant when up and about that only occasionally did they retain enough to void a stream. These 29 could be termed "soakers." Eight others wore protection for their clothing or changed clothes daily because of wetting at least 5 days out of 7. One patient had only mild difficulty but poor control was demonstrable, the suspension operation being done incidental to the removal of an ovarian cyst. All 38 patients came to the hospital to request treatment to improve their control. Preoperatively, 37 were considered suitable for the new operation. The thirty-eighth case was an error in selection and this error was the obvious cause of failure. The patient had had 2 vaginal operations to gain control which resulted in a urethra and vesical neck so scarred as to contain almost no functioning muscle. The walls of these structures were paper-thin, apparently consisting of only a mucosal lining inside and vaginal epithelium outside. The urethra was approximately 1 centimeter in length. The supportive test was equivocal preoperatively, and postoperatively this trial procedure remained unfavorable. Only broad firm compression of the vesical outlet (not merely the urethral remnant) against the pubis permits retention of more than a few cubic centimeters.

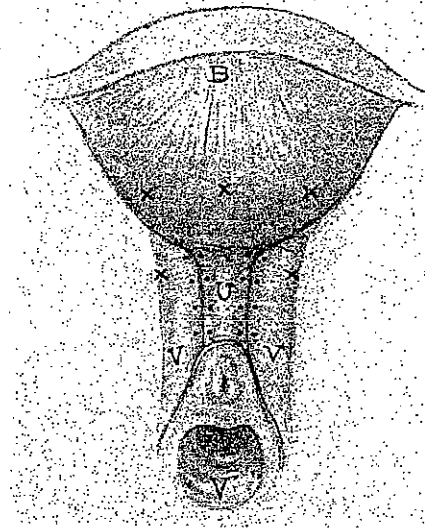


Fig. 3. Diagram of sites for sutures. Dots are for sites along urethra and vesical neck. Crosses, for sites in lower bladder and vagina. Other sutures are often taken as explained in text.

Of the whole 38 cases of this female group with so called stress incontinence 28, or 74 per cent, have entirely satisfactory urinary control at the time of this writing from 1 to 35 months after operation. By "entirely satisfactory" is meant that the patient does not wear protection for her clothes, does not even get damp in spite of pursuing her usual activities, and voids without difficulty. Seven, 18 per cent, have evident improvement but the result is not completely satisfactory. One of these 7 is a 72 year old female who had normal control until a cystocele was repaired after a radical vulvectomy for carcinoma. The cystocele was corrected, but heavy scarring around the vagina resulted which seemed to hold the urethra and vesical neck down. After the suprapubic suspension she no longer leaked in bed, voided regularly, and usually stayed dry for 20 to 40 minutes after each voiding during the day—all in direct contrast to her preoperative status. However, leakage occurs so easily she must wear protection during the day. A satisfactory pessary cannot be fitted, but manual support still improves control if enough pressure is used to release the downward tension of the vaginal fibrosis. Four others in this group of improved but not satisfactory results show approximately the

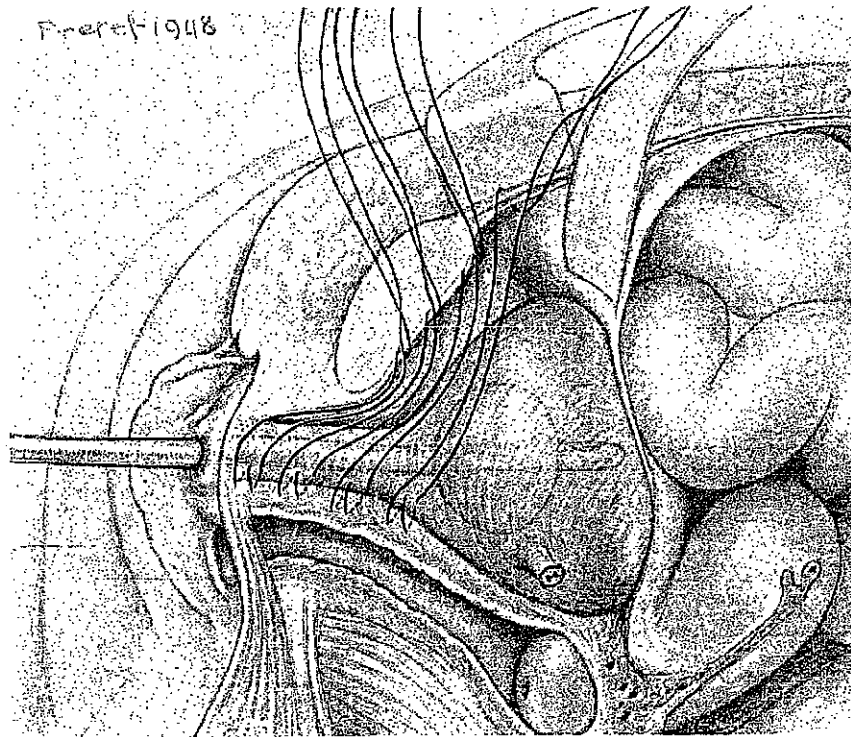


Fig. 4. Sagittal section showing location of the four pararethral sutures on the left.

same degree of improvement as in the case just described: they do wet themselves, yet not enough to be "soakers." Two patients are personally pleased. The other two, while improved, are not personally pleased by the amount of control returned. All considered, it can be academically stated that 92 per cent of the patients postoperatively show a change in urinary control definitely for the better. Three, 8 per cent, of the 38 are complete failures, one being due to improper selection as described. (The cases of incontinence due to lymphogranuloma and transurethral resection of the vesical neck are not included as being the usual type of female urinary incontinence though the cases have items in common).

These results compare reasonably well with reports in the literature concerning the results of other operations designed for the cure of this type of incontinence. Kelly and Dumm reported 20 per cent failures with the now-famous Kelly operation. The results of 105 vaginal operations for obtaining urinary control were reported by Watson as satisfactory

in 65.7 per cent, improved in 21.9 per cent, and unimproved in 12.4 per cent. Berkow, using an operation consisting of advancement of the urethral meatus and "suburethral reefing," had 2 failures in 21 attempts (9 per cent). Kennedy (7, 8, 9) after a detailed study of the anatomy and physiology concerning micturition devised a vaginal operation, similar in part to Kelly's plans, with which he has had only 7.1 per cent failures. Studdiford, using Aldridge's fascial sling operation, had 4 failures in 15 attempts (26.6 per cent) but with Studdiford's modification 27 of 30 were successful (10.0 per cent failures). Te Linde reports 90.3 per cent well, 5 per cent improved, and 3.5 per cent unimproved with a Kelly-type procedure used selectively 249 times.

The details of the follow-up of cases, including definition of terms and time elapsed since operation, are seldom indicated in the literature. Most of the results reported are immediate outcomes, yet late recurrences are recognized not to be rarities. One author (14) reported 45.5 per cent recurrence of poor urinary control when 78.4 per cent had been



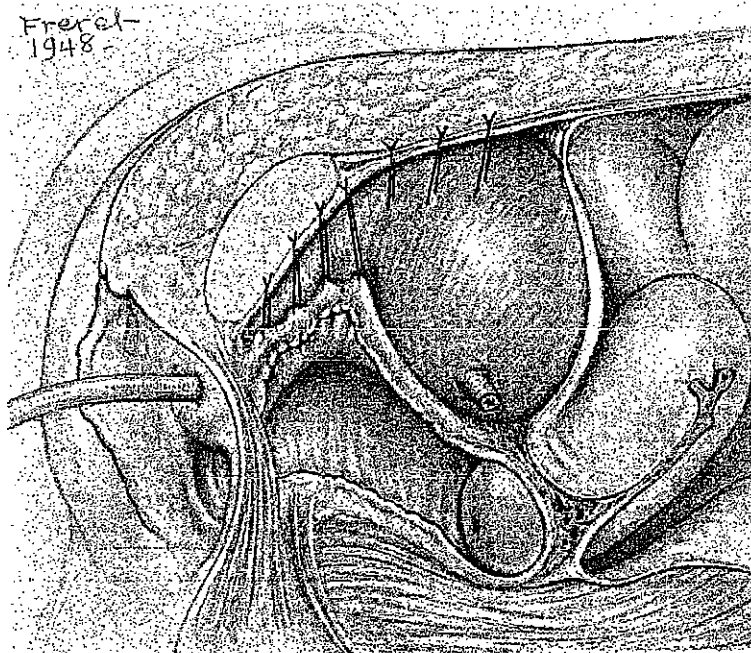


Fig. 5. Same as Figure 4 except sutures tied—diagrammatic, as actually less space remains between origin and insertion of sutures.

satisfactory immediately following anterior colporrhaphy. In the present series 3 recurrences of poor control have appeared since discharge from the hospital, 2 within 6 months and 1 later. Onset of recurrence was with lifting or severe coughing in each case. The other unsatisfactory results were evident upon removal of the catheter after operation. The follow-up time between operation and the last definite record regarding urinary control varies from 1 to 35 months, with 28 having been followed 6 months or more; 16, one year or more; and 5, two years or more. All patients have been seen since discharge. The effect of pregnancy, and especially vaginal delivery, upon the suprapubic suspension has not been tested, but from general considerations we advise these patients against pregnancy.

A review of the literature might lead one to believe that the standard gynecological operations for incontinence rarely, if ever, made the patients' condition worse; yet experienced gynecologists are aware of such complications as vaginal fistulas, ureteral fistulas, ureteral ligation, and poorer control. None of these occurred in the present small series but because of the operative approach the incidence

of these complications should be exceedingly small. One patient's urethra was so adherent from 4 previously unsuccessful operations that an opening was inadvertently made into it which was sutured. A small amount of urinary drainage occurred suprapubically for 7 days after which the fistula closed spontaneously. This patient had normal control 6 months later. Two psychiatric patients with both enuresis and partial incontinence were cured of the incontinence but not of the enuresis (though one wet the bed only once in a year after operation). Often the patients had frequency and urgency until the irritative effects of the indwelling catheter and infection were overcome after operation. Two wound infections occurred, both were mild, and neither required additional drainage but in one of these a hernia later developed. One other patient has a ventral hernia but this is apparently the result of a previous suprapubic operation. Two hematomas occurred but did not impair the result. One patient had an attack of acute cholecystitis during her hospital stay and one had pains suggesting osteitis pubis which promptly subsided. There were no deaths.



Of these 38 patients, 25 (66 per cent) previously had a total of 40 standard gynecological operations which should have provided good urinary control but failed to do so. These operations included simple anterior colporrhaphy, the Kelly operation, the Kennedy procedure, various plications, and combined suprapubic-vaginal operations apparently of the fascial sling type. Nineteen or 76 per cent, of these patients previously operated upon unsuccessfully now have good control; an additional 3 are improved, but not satisfactory, and 3 are failures. The candidates were selected in the manner already indicated, though one failure was due to poor selection as already discussed. Twenty-one of these 25 patients have been followed 6 months or more and 11 for 1 year or more. Three patients leaving the hospital with excellent control have had a decrease in ability to retain urine. A reasonable review of the literature concerning urinary control does not provide for comparison a well followed series of similar size in which all patients had had previously unsuccessful operations. Most authors and consultants indicate, however, that cures are more difficult to obtain after a first procedure has failed and usually emphasize any case of theirs obtaining a successful result after an initial failure. The simple suprapubic suspension and immobilization as here described seems particularly valuable for patients whose first procedure failed, but whose sphincter mechanism is demonstrated to be favorable by the test outlined, as results have been reasonably good, no tissues are likely to be destroyed, no patients have been made worse, and the procedure is not difficult for either surgeon or patient.

In addition to the cases of stress incontinence in females already discussed, 12 patients with unsatisfactory urinary control due to various causes have had simple operative elevation and fixation of the vesical outlet to elucidate further the advantages and limitations of the basic plan derived from the study of patients with dysfunction after excision of the rectum. In these 12, 5 had satisfactory results, 4 being excellent; 2 were improved, but not satisfactory; and 5 were complete failures. A résumé of these 12 miscellaneous cases is given below.

L.H., N.Y.H. history No. 466 376 (seen with Dr. Thomas J. Kirwin), a 60 year old female had had a transurethral resection of the vesical outlet elsewhere because of episodes of difficulty in voiding. In spite of three Kelly type vaginal operations by well trained surgeons she remained constantly soaked during the day and needed 3 to 8 pads during the night. The supportive test was favorable, as were the other routine examinations already outlined. The described operation resulted in a marked improvement, but it cannot be classified as entirely satisfactory. The patient, 2 months later, voids regularly in amounts up to 300 cubic centimeters, does not wet the bed, can sit and walk without leaking, but on getting from the lying or sitting position to standing when the bladder is full, leakage varying from a few drops to a tablespoonful occurs. Nocturnal urgency is her main complaint. She does not wear a pad regularly.

The case is not classified as the routine variety of female stress incontinence because the poor control resulted from a transurethral resection.

Four females with carcinoma of the urethra had excision leaving 1 centimeter or less of urethra. The vesical neck was suspended by sutures to the interior surface of the pubis through a wide vaginal exposure. Two of these, one with only 2 millimeters of urethra, have satisfactory control; one whose carcinoma recurred occasionally wets herself on coughing and straining, but did not need a perineal pad; and one had good control until the wound infection broke down the suturing (a pessary support has, however, provided normal control for over 4 months). These cases are of special interest because most of the urethra with a large part of any surrounding sphincter has been removed, yet reasonable control has been obtained.

M. B., N.Y.H., History No. 439 709, a 40 year old negress with extreme scarring from lymphogranuloma, was almost totally incontinent. The supportive test was favorable. However, it was necessary to move the vagina and rectum to support the bladder because of the fibrosis joining these structures solidly. A suprapubic suspension produced no evident change as an adequate elevation and fixation was not possible. Then a Kelly type vaginal operation, through the unhealthy fibrosis, gave excellent control; but it too failed when a hemorrhage into the vaginal wound occurred.

L. R., M.H., History No. 75687, a 40 year old female, had difficulty voiding and a residual urine in the bladder varying from 300 to 700 cubic centimeters after an abdominoperineal excision of the rectum for carcinoma. A suprapubic suspension through an incision immediately adjacent to the

colostomy reduced the residual to 75 to 200 cubic centimeters, but a wound infection disrupted the suturing with resultant return of the same degree of retention.

The case of a male patient having a successful suprapubic suspension after removal of the rectum and transurethral resections was outlined at the beginning of this article. One additional case, almost exactly similar, has shown improvement; the patient is pleased but he does leak at times so the result is classed as improved but not satisfactory.

Of three male patients having unfavorable supportive tests preoperatively, only one obtained improvement, though none became worse. Two were incontinent after suprapubic prostatectomies done elsewhere, and one after accidental transurethral incision of the external sphincter by us.

#### DISCUSSION

The word "new" is used advisedly in referring to this simple suprapubic vesicourethral suspension. As far as we can determine, the procedure as a whole is new for *incontinence*. Hepburn (4, 5), and later Miller (12), used a similar technique for *prolapse* of the female urethra, but not primarily for the correction of incontinence. However, Miller (12) remarked that 1 of his 3 patients had better control following operation so that the procedure might cause improvement. Others, notably Perrin and Williams, have sutured the top of the vesical outlet to the symphysis and thereby improved control. Apparently they did not suspend and fix the urethra also. Suprapubic Kelly type plications, some successful, have been reported by Furniss and others. Suprapubic transvesical operations (10, 22) may have had part of their success due to the unrecognized adherence of the vesical neck to the symphysis postoperatively. The mere conception of elevating and fixing the outlet is by no means new but surprisingly is frequently ignored.

The exact mechanism by which this operation improved urinary control in most of the selected cases is not entirely understood. However, simple elevation and fixation of the vesical outlet and urethra seem to be the only

significant change that can result from the technique. No muscles are plicated and no hammock-like support is constructed under the sphincter. Most sphincters have two or more relatively firm attachments and perhaps the major achievement of the operation is providing such attachment. The recent work of Rose particularly stresses the importance of these attachments in contributing to normal urinary control.

#### SUMMARY

The development of a new operation for certain types of urinary incontinence has been described. A preoperative test, consisting essentially of temporary elevation and fixation of the vesical neck and urethra, has permitted the selection of those candidates who have an excellent chance for improvement by the operation, and which at the same time seems to indicate those whose postoperative result will not be good. The operation is a simple elevation and immobilization of the vesical neck and urethra by suturing them to the pubis and rectus muscles. Of 44 suitable cases excellent results were obtained in 36 (82%), significant improvement in 3 (7%), and no improvement in 5 (11%). The causes of most of the failures seem evident and are discussed. The most significant group reported consisted of 25 patients with the common variety of female stress incontinence which had failed to be corrected by one or more standard gynecological procedures for incontinence. Of these 25 patients, 19 have normal control from 1 to 35 months after this new operation with 21 having been followed 6 months or more. Poorer urinary control did not result in any instance.

It is not the intent of this presentation to advocate this operation to the exclusion of others. As can be seen, the procedure is followed by failures in 10 to 15 per cent though careful use of the described preoperative test should permit better selection and thereby fewer failures.<sup>1</sup> The intent is to emphasize two principal points: first, that elevation and

<sup>1</sup>Since preparation of this article an additional 20 patients have been operated upon by this technique. Nineteen have excellent results and the follow-up is incomplete in the other case.

fixation of the vesical neck is a major factor in the maintenance of urinary control; and, second, that this operation is worthy of trial in selected cases in which previous surgery has failed.

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