

THE RESULTS OF TREATMENT IN CERTAIN TYPES OF INCONTINENCE*

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Few patients present a greater challenge to the urologist than those who are continuously, or even intermittently, wet. My interest in the subject, first aroused by a paper by Terence Millin in 1939,¹ has been constantly stimulated by the frequent visits to my consulting rooms of a patient on whom I have performed several operations and whom I have still only partially cured. This man has forcibly brought home to me the shifts and social evasions forced upon these unfortunate individuals, the influence of their disability upon their chances of securing employment, and the state of despair to which constant wetness, excoriated skin, and a constant urinary odour reduce them. Incontinence bags, a misery to the male, are almost impossible to adjust with success in the female. A penile clamp, at first hailed as a boon, ultimately becomes a burden through inaccurate adjustment of pressure, or through skin ulceration; and leaks occur past the clamp. Training, exercises, dilatation, and electrotherapy will relieve only the minor degrees of incontinence.

This paper is concerned with those cases of true incontinence amenable to surgical repair, and is an attempt to assess the results of treatment in patients seen and treated personally over a 15-year period.

I am excluding from this small series patients with traumatic paraplegia and patients with incontinence resulting from other neurological causes, as well as patients with fistulae which sometimes follow suprapubic operations. The latter group of patients are usually successfully treated according to the ordinary principles of urological surgery, namely, relief of bladder-neck obstruction and, if necessary, dissection and closure of the fistula.

The types selected therefore fall into 2 groups:

- A. Those associated with the trauma of childbirth or surgery.
 1. Stress incontinence in females.
 2. Uretero-vaginal fistulae following pelvic surgery.
 3. Vesico-vaginal fistulae.
 4. Incontinence following operations on the prostate.

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B. Congenital causes.

1. Ectopia vesicae.
2. Epispadias.
3. Aberrant ureteric orifice.

This is admittedly a somewhat restricted and selective list and does not include all cases of incontinence.

STRESS INCONTINENCE IN FEMALES

During the last decade I have operated on 11 patients for this condition. In every case the Millin I operation² has been performed, and a cure has resulted in every case. The complication rate has been high, and the difficulty of the operation has in some cases been considerable. It has been difficult to make the tunnel for the sling without some trauma to the bladder or urethra. I have also not found it easy to close the fascial gap in fat patients. These difficulties have been, I think, from inexperience, and I have not had much trouble with the last half-dozen cases.

Several points need emphasis. A careful history should be taken and a thorough clinical examination made. A routine intravenous urogram should include a cystogram, both in the supine and in the erect position. There will usually be some descent of the bladder, but I have not found this a determining factor when deciding whether to operate or not. Urethrography, similarly, is interesting, but not conclusive.

It is at cystoscopy, which should be routine (to exclude urge incontinence from cystitis and other bladder lesions), that the clinical diagnosis is made. The cystoscopy, performed with gentleness and persuasiveness, requires no anaesthetic, and at the conclusion of the examination the patient is requested (a) to strain and (b) to cough, before the bladder has been emptied.

A cystocele will be evident on straining, and in most cases of stress incontinence coughing will be accompanied by a forcible jet of fluid from the urethra.

If two fingers are now placed, one on either side of the urethra, well up on the anterior vaginal wall, as advocated by Bonney,³ the leak will be controlled. If no leak is detected while the patient is in the cystoscopy position, it should be looked for with the patient standing.

TABLE I. INCIDENCE OF COMPLICATIONS

Case	Age	Spurt	Previous operations	Signs of injury to bladder or urethra	Result
1	38	++	1 colporrhaphy	Blood drained from bladder	Cure
2	38	++	1 colporrhaphy	Urine leaked from wound. Sloughs seen on cystoscopy	Cure
3	38	++	1 colporrhaphy	Postoperative urinary leak from wound. Sloughs seen near bladder neck	
4	51	++	Gynaecologist refused	Blood in urine at end of operation	Cure
5	15	++	Double ureters. Previous left nephrectomy	Bladder accidentally opened. Closed	Cure
6	51	Only on standing	1 colporrhaphy	Nil	Cure
7	54	++	Colporrhaphy refused by gynaecologist	Nil. Transient retention later reduced to R.U. 10ml. . .	Cure
8	30	++	2 colporrhaphies	Nil	Cure
9	46	++	1 colporrhaphy	Cystitis. Cured with furadantin	Cure
10	55	+++	Left nephrectomy	Nil	Cure
11	48	+	2 colporrhaphies Marshall-Marchetti ..	Nil	Cure

The smallness of this series is partly explained by the fact that most of these patients are seen by gynaecologists, and that all patients seen by me are referred to a gynaecologist before any sling operation is undertaken. A substantial proportion of patients seen by me have been cured by a vaginal procedure by a gynaecologist, and it is only to the failures that the sling operation has been applied.

Encouraged by these results, I have not been tempted to use procedures such as the Aldridge,⁴ Millin II,⁵ or Marshall, Marchetti and Kranz⁶ operations. Kennedy⁷ describes a series of 34 patients treated by the Millin I sling with a cure rate of 87.5%. The two deaths in his series were caused by pulmonary embolism and liver necrosis.

The incidence of complications in my short series is summarized in Table I. There were no deaths.

It will be noted that one of these operations was performed on a girl of 15 (case 5) who had previously had a nephrectomy for ectopic ureter. She must be classed as a case of congenital incontinence. An indwelling catheter and a packed vagina are of great assistance in performing the Millin sling operation, and in this girl's case I was unable to separate the urethra or to control bleeding until I had ruptured the hymen and packed the vagina.

Case 10 had a left ureter opening into her urethra. I thought that a nephrectomy would cure her, but she remained incontinent after this operation. Since the sling operation she has abandoned a vaginal tampon that she was previously obliged to wear. The gynaecologist who referred her to me had declined to consider a vaginal operation.

The Millin I sling has to some extent fallen into disrepute. I do not think that this is justified. As Millin⁵ points out, it is a difficult procedure for those not

accustomed to working in the retropubic space. Horrific tales are told of fascial slings working their way through the urethra or bladder and hanging loose in the urinary tract. I believe that attention to 2 details will prevent this disaster:

1. The urethra should be freed over a limited area by working away from it, with curved forceps, onto a tightly packed vagina. A catheter in the urethra is grasped between finger and thumb, and dissection proceeds behind it by opening and closing a Moynihan's forceps onto the vagina and so creating the desired tunnel.

2. No attempt should be made to have a tight sling. This is quite unnecessary. I adjust it with great care, and no tension.

URETERO-VAGINAL AND URETERO-ABDOMINAL FISTULAE

My series includes 18 patients with ureteric injury caused by pelvic surgery. Of these, 15 had fistulae and are included in this series. The question of ureteric injuries in gynaecology has been admirably dealt with in a recent paper by Jacobson,⁸ and the simple technique of uretero-neocystostomy advocated by him has been used. I leave a splinting polythene tube in for 16 days, reinforce the anastomosis by stitches outside the bladder, fixing the bladder to the outer coat of the ureter, and drain the bladder suprapubically.

Uretero-neocystostomy succeeded in 9 patients. One of these subsequently developed a staghorn calculus and 2 others developed infection which yielded to treatment. In 1 anastomosis failed, and 1 could not be done owing to fibrosis. Three patients were treated by nephrectomy, with cure of the fistula, and in 1 the ureter was exposed, incised, and splinted with a good result. The patient whose ureters could not be liberated (owing to fibrosis), sub-

TABLE II. URETERIC INJURIES

Case	Age	Causative trauma	Treatment	Result	Complications
1	47	Hysterectomy	L. uretero-neo-cystostomy	Cure. Normal efflux	Nil
2	50	Hysterectomy	R. uretero-neo-cystostomy	Cure	Nil
3	50	Ca. cervix. Wertheim	L. uretero-neo-cystostomy	Cure	Staghorn calculus
4	77	Abdomino-perineal resection of rectum	R. uretero-neo-cystostomy	Cure	Nil
5	46	Ca. cervix. Radium. Wertheim.	L. uretero-neo-cystostomy	Failure	See vesico-vaginal fistula
6	?	Ca. cervix. Wertheim. Bilateral uretero-vaginal fistula. Both u. blocked 4 cm.	Exploration. Widespread fibrosis. Could not identify ureters	Failure	Died of widespread secondary deposits
7	22	Caesarian section and subtotal hysterectomy, 3rd child	Ureter exposed, freed, and opened. Splinted	Cure	
8	?	Hysterectomy. Both u. injured. R. nephrostomy	L.u. cath. Pyelogram normal (recovered). R. subcapsular nephrectomy	Cure	
9	55	Hysterectomy	L. uretero-neo-cystostomy	Cure	Infection cured by furadantin
10	53	Hysterectomy (fibroids)	L. uretero-neo-cystostomy	Cure. Normal efflux	Proteus infection
11	?	Hysterectomy 4 years ago. R. no function. L. normal. R. cath. stuck 2 cm.	R. nephrectomy	Cure	
12	36	Hysterectomy (fibroids)	L. uretero-neo-cystostomy	Cure. IVP perfect	
13	53	Hysterectomy. Uretero-abdominal F.	L. uretero-neo-cystostomy	Cure. IVP perfect	
14	36	Hysterectomy. Division of ureter and repair over cath. 3 weeks later I recovered cath. from bladder. Leak. Peritonitis. Fistula (10 cm.)	Subcapsular L. nephrectomy	Cure	
15	—	Hysterectomy. Left uretero-vaginal fistula. Fistula healed. Left hydronephrosis, dye goes through stricture	L. uretero-neo-cystostomy	Cure	

sequently died of widespread metastases. The anastomosis which failed had been performed on a patient who had had a Wertheim hysterectomy after radium treatment and later received X-ray treatment. It is possible that the irradiation contributed to the failure of the tissues to unite.⁹

The results of treatment here have, on the whole, been very satisfactory. The new ureteric orifice has been observed to efflux normally in 3 of the patients and in 2 a cystogram has failed to reveal reflux. These investigations have not been carried out on all the patients. The whole series of ureteric injuries will be reported in detail in a later paper, with the addition of further cases.

Details of these patients are given in Table II.

VESICO-VAGINAL FISTULAE

I saw 25 patients with vesico-vaginal fistula. Of these, 6 had had no previous attempts at cure, and of the six 5 were cured, 3 by an ordinary transvesical procedure, and 1 at a second attempt by myself, using a transperitoneal bladder-splitting technique (Morgan,¹⁰ Dorsey¹¹), and 1 by a vaginal repair with added cystostomy drainage.

The remainder had all had one or more gynaecological attempts at vaginal closure, two of the series having had 5 operations, one 3 operations, four 2 operations, and the remainder 1 previous operation (Table III).

In all, only 9 of the 25 were completely cured, and 3 were partially cured, expressing themselves as satisfied and refusing further operation. One of these patients had had an unsuccessful vaginal attempt. This was followed by a pyonephrosis for which I did a nephrectomy. I then closed the fistula by a transvesical operation after removing a stone. On the 17th day severe secondary haemorrhage, necessitating repeated transfusions, led to my asking Prof. J. T. Louw to operate from below and ligate the cervical branch of the uterine artery. He did this with vaginal closure of the fistula, and she now has a tiny hole which leaks only at night. The other two partial cures had had their urethrae completely destroyed and a wide fistula plastered on the back of the pubis. These were closed and an attempt made to fashion a new urethra by tunnelling and pulling down flaps to the distal $\frac{1}{4}$ inches remaining of the urethra. Both of these patients leak a little through the urethra.

In all, of the 9 patients cured, 5 were approached transvesically, 2 by transperitoneal bladder-splitting operations, and 2 by vaginal closure supplemented by cystostomy. Ten patients were subjected to uretero-sigmoidostomy, with one death from sepsis and peritonitis.

In one patient Prof. J. H. Louw made an ileal conduit and I implanted the ureters into this. There was some

TABLE III. RECORD OF 25 CASES OF VESICO-VAGINAL FISTULAE

Case	Age	Cause	Previous operations	Treatment	Result
1	40	Hysterectomy	No previous attempt	Transvesical	Cure
2	18	Childbirth	Gross sepsis. Weak. Very large fistula	Uretero-sigmoidostomy	Death
3	19	Childbirth	1 gynae. failure	Uretero-sigmoidostomy	Recovery good pyelograms
4	28	Childbirth	2 gynae. failures	Uretero-sigmoidostomy	Recovery. Blood urea 68
5	?	Childbirth	Not stated	Uretero-sigmoidostomy	Blood urea 156. Seems well
6	29	Childbirth	Bladder vault is vaginal vault	Uretero-sigmoidostomy	Blood urea 140 in 1 month, 60 in 3 months
7	28	Childbirth	Urethra and trigone gone	Uretero-sigmoidostomy	Recovery
8	20	Childbirth	Repeated failures. L. inguinal colostomy	Ileal bladder with J. H. Louw	Recovery
9	22	Childbirth	J. T. Louw—vagina. L. nephrectomy for pyonephrosis	Removed stone. Repair from above. Severe haemorrhage (secondary). J. T. Louw from below	Partial cure (tiny hole). Leaks at night
10	22	Childbirth	5 gynae. operations	Bladder-splitting	Cure
11	28	Caesarean section	2 gynae. failures	Transvesical	Cure
12	51	Surgical	2 gynae. failures	Vaginal	Failure
13	23	Childbirth	Colostomy and alleged uretero-sigmoidostomy elsewhere. Blocked urethra	Transvesical	Leaks through urethra. Lost sight of
14	24	Childbirth	5 unsuccessful gynae. operations	(1) Vaginal + cystostomy (2) Uretero-sigmoidostomy	(1) Failed (2) Satisfactory
15	20	Childbirth	Vaginal and suprapubic attempts failed. Fistula under pubis	Uretero-sigmoidostomy	Satisfactory
16	25	Childbirth	2 gynae. operations	(1) Vaginal and cystostomy (2) Bladder split (3) Uretero-sigmoidostomy	(1) Failed (2) Failed (3) Satisfactory
17	46	Hysterectomy	1 gynae. attempt	Transvesical	Cure
18	30	Caesarean hysterectomy	Nil	Transvesical	Cure
19	32	Childbirth	Nil	Transvesical	Cure
20	40	Childbirth	Nil	Vaginal	Cure
21	45	Childbirth 13 yrs. before	3 previous gynae. attempts	Vaginal	Cure
22	68	1 Hysterectomy 2 Abdominoperineal	Nil	(1) Failure-fibrosis (2) Fistula dissect off sacrum and closed	Cure (transperitoneal)
23	30	Childbirth	Urethra destroyed and closed fistula on pubis	Closure of fistula and tunnelling of new urethra	Closed, but poor control
24	20	Childbirth	Urethra destroyed. 2 previous attempts	My attempt failed, uretero-sigmoidostomy	Satisfactory
25	21	Childbirth	Decided to attempt ileal bladder. Large suppurating cyst		Failed

leakage, but the patient recovered. One vaginal attempt was a complete failure and I did not see the patient again.

The record therefore is:

Cases 25.

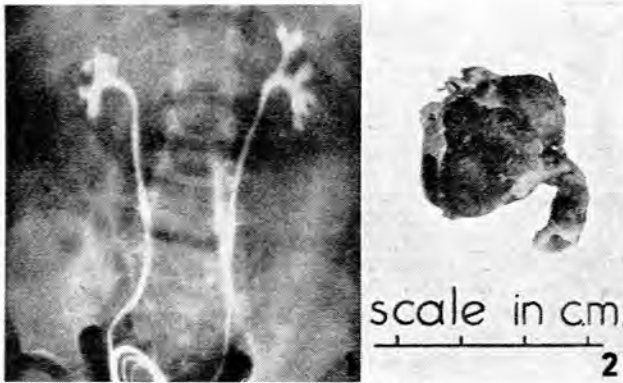
Cures 9; transvesical 5, bladder-splitting 2, and vaginal plus cystostomy 2.

Partial cures 3.

Failures, lost sight of 2.

Ileal conduit 1.

Uretero-sigmoidostomy 10.



Figs. 1 and 2. See text.

Of the patients subjected to uretero-sigmoidostomy, 1 died, 3 gave early evidence of hydronephrosis, but seemed well clinically, and 5 were apparently satisfactory. Follow-up in most of these women has been impossible, since they return to their tribal areas and are lost sight of.

I am sure that uretero-sigmoidostomy must be replaced by one of the techniques which avoid infection and hyperchloraemic acidosis, but I have been conditioned in the past by the fact that any efficient sphincter is preferable to an apparatus which these rather primitive women have to wear and manage.

ECTOPIC URETERS

Two patients with constant wetness from an ectopic vaginal ureter have been dealt with by partial nephrectomy. The first patient (Figs. 1 and 2) had been treated on psychological lines for enuresis for some months. The truncated right pyelogram with the upper calyces missing is characteristic. I tried hard to find and catheterize a vaginal opening, but failed. The small upper portion of the kidney, drained by the ectopic ureter, was removed practically bloodlessly. In the second patient (Figs. 3, 4 and 5), the paediatrician (Dr. P. V. Suckling) who referred the patient to me, had made the diagnosis by noting the

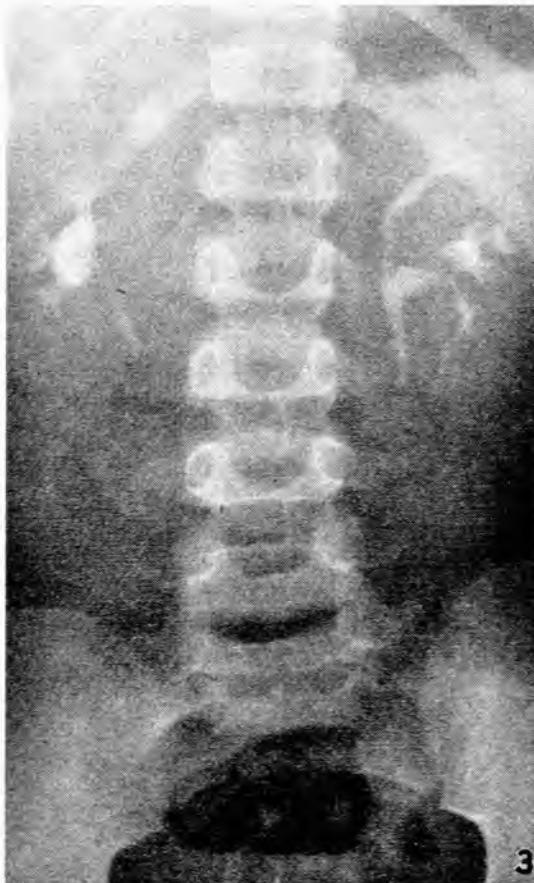


Fig. 3. Pre-operative pyelogram.



Fig. 4. Postoperative pyelogram.



Fig. 5. See text.

characteristic syndrome of constant wetness associated with normal regular micturition. In this case evidence of the upper segment could be seen, but I again failed to find or catheterize the ectopic opening.

Partial nephrectomy was again easy and practically bloodless, and I removed most of the dilated ureter.

MALE INCONTINENCE

Temporary incontinence after removal of a very big prostate by the retropubic method is not uncommon, possibly because the catheter is removed so early. I have not found that it persists.

Of the 4 patients with male incontinence I have treated, 1 followed dissection of a fibrous prostate elsewhere, 1 appeared to be caused by widespread excavations following prostatic abscesses, and 1 by transurethral resection of a carcinoma. I used Millin's perineal urethroplasty with ribbon catgut with success in the first 2, and failure in the third.

My fourth attempt at urethroplasty was in the patient mentioned at the beginning of this paper. He had had a transurethral resection elsewhere which led to moderate incontinence. At cystoscopy a projecting nubbin of prostatic tissue was seen, well above the verumontanum. I resected this and his incontinence became complete. A colleague to whom I referred the patient found another projection and increased his incontinence still further. I then did a ribbon catgut encirclement of the bulb, with complete success for 6 months. The patient then had left renal pain and a non-functioning kidney. After cystoscopy and retrograde pyelography he again became completely incontinent. I repeated the procedure with fascia lata, without success. He then wore a Cunningham clamp for some years, and finally I performed a sling operation of the type suggested by Uhle and Bradley,¹² and he has now

dispensed with the clamp and can control his stream, but is occasionally wet.

ECTOPIA VESICAE

Two patients have been treated by uretero-sigmoidostomy, with 1 death. The infants were both under 2 years. In the surviving patient I removed the bladder mucosa and closed the defect 5 years later by the method suggested by Spence.¹³ One of the kidneys was moderately hydronephrotic 5 years after the uretero-sigmoidostomy.

EPISPADIAS

I have attempted to cure the incontinence in 2 patients with male epispadias, and failed in both of them. Symphysiotomy was performed and an endeavour made to bring together what Sweetser¹⁴ calls the 'posterior transverse intersymphyseal band'.

SUMMARY

In this paper an attempt is made to assess the results of treatment in patients (seen and treated personally over a period of 15 years) who were suffering from true incontinence amenable to surgical repair.

I wish to thank Mr. G. McManus for the excellent photographs.

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