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Cystometric studies of gynecological patients with pelvic relaxation

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CYSTOMETRIC STUDIES OF GYNECOLOGICAL PATIENTS WITH PELVIC RELAXATION

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INTRODUCTION

The purpose of this study is: (1) to determine if a correlation exists between the cystometrogram and symptoms and physical findings in patients with cystocele, rectocele, urethrocele, or prolapse and to determine by doing post-operative cystometrograms if the operations produce normal bladder function; and (2) to determine if the cystometrogram shows which, if any, of these parients benefits from surgery.

These cystometrograms were performed upon twenty-four women patients with urinary symptoms or physical findings of pelvic relaxation, and upon nine men patients with bladder disorders. Although this is primarily a study of gynecologic patients, studies upon the men were included to demonstrate types of bladders not available because of a lack of women patients with these types of symptoms.

This is not intended to be a final study on this subject, as only thirty-three patients were included, but rather is a pilot study of this type examination of bladder function.

Cystometry, as a method of examination which has value in clinical gynecologic practice to reduce diagnostic inaccuracies and therapeutic failures, will be described and the results of its application will be reported and discussed in this paper.

MATERIAL AND METHOD

The object of cystometry is to measure the changes in the

intravesicle pressure when the bladder is being progressively filled with fluid to its maximal capacity. The apparatus used is a modification of that described by Munro (1).

The Material used in the procedure consists of a 700 ml. container graduated in 25 ml. amounts. To the outlet is connected an air-tight "Murphy drip". Above the drip an adjustable clamp surrounds the connecting tube. A length of tubing connects the "Murphy drip" to a glass "Y" tube, of which one end connects to a water manometer made of 4 mm. bore glass tubing attached to a one meter rule. The other end of the "Y" tube is attached to the distal end of an inlying Foley catheter. The graduated container with tubing is filled with room temperature sterile saline.

Before starting the procedure, vaginal packs and pessaries are removed and prolapsed uteri replaced in the vagina. The patient is asked to void and assume the lithotomy position and under aseptic precautions a large (22 French) Foley catheter is inserted through the urethra and the bag of the catheter is filled with 10 ml. of sterile saline. The residual urine is collected and measured. The extroceptive sensation of the bladder is tested by first instilling approximately 100 ml. iced sterile saline (33°F.) with an asepto syringe and then emptying the bladder and instilling approximately 100 ml. warm sterile saline (120°F.); the bladder is again emptied. The patient is asked to determine the temperatures each time, i. e., hot, cold or undeterminable. The water manometer is adjusted so that the zero point is at the same

level as the urethra and the catheter is connected to the tubing of the apparatus which has been prepared beforehand and is described above. It is important to make sure that the system is free from air and that the water levels in the graduated container and in the manometer are at the zero point.

The patient is instructed to relax and not talk or move about. She is instructed to tell the examiner when the first desire to void is felt and again when extreme fullness is felt. The saline is allowed to run at the fastest rate at which a drop may still be seen in the "Murphy drip" (approximately 65 ml. per min.). The manometer pressure is plotted on a graph against the milliliters of saline instilled. The volume at time of first desire and at time of fullness is recorded. Normally, when maximum bladder capacity is reached, the intravesical pressure will rise to a high level. The bladder is emptied and the catheter removed. The bulbocavernous reflex is tested by noting rectal sphincter action when the glans clitoris is pinched, Lapides (2).

Changes in pressure due to respiration and obvious voluntary movements of the patient were not recorded. Post operative studies include only the cystometric procedure.

RESULTS

Normal Bladder

For purposes of this study, the normal cystometrogram is one in which there is normal proprioceptive and extroceptive sensation;

there are no uninhibited contractions before the maximum capacity is reached; there is a normal bulbocavernous reflex; there is a bladder capacity of 350 to 500 ml., a residual urine less than 50 ml., a first desire at 150 to 200 ml., feeling of fullness at 300 to 500 ml., and a characteristic curve in which the pressure rises to a certain level at the onset of the procedure and there remains until the bladder capacity is reached, Nesbit, Lapides, and Baum (3).

Nine cases are presented as normal bladders by cystometric study, although in each case genito-urinary symptoms and, or, physical findings were present. The first desire to pass urine occurred between 35 and 400 ml.; the average was 170 ml. The sensation of fullness occurred from 150 to 500 ml.; the average was 320 ml.

In five patients with chronic cystitis, four who had some degree of cysto-urethrocele (Cases 1-4), and one who had a previous perineal repair (Case 5), filling of the bladder resulted in marked discomfort to the patient and a rise in intravesicle pressure with increasing volume. The first desire and fullness occurred at a much lower volume than in a non-infected bladder. Residual urine ranged from 0 to 40 ml. Frequency of micturation, burning, urgency and stress incontinence were common symptoms. All cases were shown to have pus cells in the urine.

Two cases of moderate prolapse were found to have normal cystometrograms. One patient (Case 6), a 29-year-old mother of

six children, surprisingly had a normal cystometrogram even though she had a prolapse for two years. During her last pregnancy, the cervix had protruded from the vagina and she gave birth to a ten-pound-three-ounce infant.

The other patient (Case 7), was an 82-year-old woman with marked cerebral arteriosclerosis. Symptoms included pressure, frequency, nocturia, urgency and stress incontinence of two years duration; she, too, had a normal cystometrogram.

A patient (Case 8), with symptoms of burning after urination, frequency, difficulty starting a stream, nocturia, and stress incontinence, was found to have a small papilloma of the bladder neck.

One woman (Case 9), was studied who had an enterocele as large as a complete procedentia. She had a vaginal hysterectomy four years before. The enterocele sac was very tender to palpation and the cystometric curve showed bladder hypertonia, ranging from 50 to 60 cm. of water.

Decompensated Bladder

Fourteen patients in the study were found to have decompensated bladders, i. e., with normal innervation but with a capacity over 500 ml., and, or, residual urine over 50 ml.

In twelve cases (Cases 10-21), the symptoms, physical findings, and cystometrograms were similar in nature. Frequency and nocturia were constant symptoms; urgency, stress incontinence and difficulty starting a stream were also frequently noted. In

all cases, prolapse with varying degrees of cystocele was present. The average content of the bladder at the first desire to void was 347 ml., and the average content of the bladder at the feeling of fullness was 573 ml.; both figures were markedly increased over normal.

The average residual urine was 50 ml., and the average bladder capacity was 793 ml. The largest bladder capacity was 1200 ml. in a patient with complete prolapse who had only mild urinary symptoms.

All twelve of these patients were treated surgically by vaginal hysterectomy, and, or, anterior-posterior colporrhaphy. Cystometrograms were repeated approximately six weeks after the operation.

In all cases a perfect anatomic result followed the operations and there was improvement of symptoms, but in only four cases was the cystometrogram normal and in five cases there was no improvement shown by cystometric examination.

One case of decompensated bladder with a capacity of 1200 ml. was found in a woman (Case 22), who had an anterior-posterior colporrhaphy eighteen months before with good repair to physical examination, who continued to complain of urgency incontinence. The cystometrogram was done to rule out neurologic disorders.

Another case of decompensated bladder was found in a mentally retarded 39-year-old man (Case 23), who had acute urinary retention when he was admitted to the hospital with a huge impaction

resulting from a megacolon. With removal of the impaction, urinary function returned. A cystometrogram done two weeks after the return of normal function showed normal innervation with 300 ml. residual urine and 1250 ml. capacity.

Neurogenic Bladders

All five types of neurogenic bladders were demonstrated in the studies of ten cases, Nesbit, Lapides, and Baum (3). Men were used in a few cases because no women patients of certain types were available.

The uninhibited neurogenic bladder shows the least variance from normal with only a loss of cerebral inhibition over reflex bladder contractions. Residual urine is zero, bladder sensation is normal, and the bulbocavernous reflex is present.

A 25-year-old woman (Case 24), had complained of eneuresis and urgency incontinence for three years; she also had narcolepsy and catalepsy for six years. She had complete remission of eneuresis during two pregnancies. Physical examination, including an exhaustive neurological examination, showed no abnormalities. The patient was found to have small uninhibited contractions and a first desire to urinate beginning at 100 ml. The contractions increased in intensity until at 180 ml. bladder pressure rose to over 100 cm. of water. The bladder was emptied and Pro-banthine (30 mg.) was injected intravenously. After five minutes, the cystometrogram was repeated, at which time 550 ml. solution was

instilled into the bladder before a feeling of fullness was experienced by the patient and strong uninhibited contractions of the bladder occurred. Upon removal of the catheter the patient was unable to void, since a motor paralytic bladder had been induced by the large dose of intravenous Pro-banthine. After careful adjustment of dosage was made, the patient was entirely free from urinary symptoms and was happy. A daily oral maintenance dosage of 150 mg. Pro-banthine was required.

A man with a cervical cord injury (Case 25), showed a type of uninhibited neurogenic bladder. He had partial paralysis of his upper extremities and almost complete paralysis of his lower extremities. An external condrom catheter was being used. The patient had severe pain when a Foley catheter was inserted for the cystometrogram. Although proprioceptive sensation was absent, I classified this as an uninhibited type because he possessed a sensation to cold and a small capacity (60 ml.).

The reflex neurogenic bladder is demonstrated in three young men, all of whom were quadraplegics as a result of cervical cord injuries. Micturation is reflex and involuntary. The ability to start or stop micturation is lost along with all bladder sensation, although some visceral sense of impending bladder contraction may be present. Bulbocavernous reflex is absent.

The cystometric curve in two of these cases has a series of uninhibited contractions which build up to an emptying contraction when capacity is reached (Cases 26-27); the other (Case 28), has a

smooth curve with increasing volume to capacity at which time an uninhibited emptying contraction occurs. Bladder capacity was between 150 to 250 ml. Two of the patients had supra-pubic cystostomies and one patient had continuous urethral catheter drainage.

The autonomous neurogenic bladder is produced when both limbs of the reflex arc which control the bladder or both the sensory and motor roots in the sacral plexis are destroyed. The patient has no urge to void and cannot void voluntarily. Two cases were studied.

A 55-year-old man (Case 29), was first troubled by urinary retention following an operation on a spinal bifida. The cystometrogram showed no extroceptive sensation, no discomfort with bladder distention, and a typical curve on which the intravesicle pressure varies directly with the intravesicle volume so that a straight-line relationship results. This patient obtained some relief from a trans-urethral resection.

A patient with idiopathic spinal cord degeneration (Case 30), who had a typical autonomous neurogenic bladder, showed no extroceptive or proprioceptive sensation. This patient was treated by a supra-pubic cystostomy.

The sensory paralytic bladder results from interruption of the sensory limb of the segmental or suprasegmental reflex arc. Atony is secondary to prolonged overdistention due to lack of sensation and desire to void. Great capacity and overflow incon-

tinence are present in advanced cases.

A 53-year-old woman (Case 31), had a history of a Watkins interposition operation in 1948 for stress incontinence and uterine prolapse. She complained that she could not walk any distance without losing urine; she complained of urgency, and that it would take her a longer time to void than others. Cystometric studies revealed an absence of extroceptive sensation, a bulbocavernous reflex, no desire to void, vague feeling of fullness at 500 ml., and epigastric pain at 625 ml. Filling was stopped at 850 ml. after patient complained of severe epigastric pain. Intravesicle pressure at this time was only 30 cm. A maximum intravesicle pressure of 47 cm. could be obtained only when the patient pressed on her abdomen with her hands.

The motor paralytic bladder results when the motor neurones or nerves which control the bladder are injured or fail to function. Normal sensation is retained. Atony and overdistention result if there is not adequate early catheter drainage. Two cases were studied and presented, although the presence of cerebral lesions distorts the typical picture.

An 82-year-old man (Case 32), was mentally confused and, following a series of cerebral thromboses, had urinary retention which required continuous catheter drainage. Diagnostic cystometry showed absent extroceptive sensation, with first desire occurring at 175 ml. The patient did not feel full, but when the volume reached 275 ml. at a pressure of 90 cm. water, the patient

was generally very uncomfortable. He complained that his feet hurt; his face was flushed and his legs were shaking.

A 73-year-old man had urinary retention following an operation for trigeminal neuralgia (Case 33). Since the patient was unable to void, catheterization was necessary. Cystometry showed loss of extroceptive sensation, first desire at 200 ml., fullness at 360 ml. and severe bladder discomfort at 450 ml. volume and an intravesicle pressure of 50 cm. of water. There were no uninhibited contractions and the bulbocavernous reflex was present.

DISCUSSION AND CONCLUSIONS

Although this study does not contain a large number of cases, it has shown the value of cystometry in the gynecological patient as a necessary diagnostic procedure to rule out neurologic bladder disorders, the symptoms of which might otherwise be mistaken for those of pelvic relaxation and incorrectly treated.

The symptoms of the uninhibited neurogenic bladder were shown to resemble, in one case, those of incontinence due to urinary infection or inefficient urinary sphincter.

The sensory paralytic bladder found after the Watkins interposition operation has been shown to be at least a contributing cause of one patient's stress incontinence. In such a case, one might expect to find overflow incontinence even after surgical correction of the mechanical disorder, unless the patient would periodically empty her bladder. In this case, during the procedure

of bringing the uterus forward and anchoring it under the bladder, the bladder may have been denervated. Epigastric pain experienced by the patient as the bladder was distended may be referred pain as the result of pulling on structures attached by adhesions to the bladder. This operation is now rarely performed, Malpus (4).

It has been mentioned by Fujimori, Kadobayashi, and Hashimoto (5), that the rate of filling of the bladder markedly affects the volume at first desire, fullness, and capacity. At a slow rate of filling (170 drops per minute) of the normal bladder, the average capacity is about 480 ml., while with continuous filling stream, the average is 220 ml. These findings bear out those of the author who found also that bladder pressure is directly proportional to rate of filling for this study was arbitrarily taken (65 ml. per min.).

Cystometric studies were done in most cases approximately six weeks post-operatively, since this was believed to be an adequate recovery period, although Fujimori, Kadobayashi, and Hashimoto (5), report that bladder contraction waves require about 60 days to return to normal after radical hysterectomy; in this study there were no patients with this type of operation.

The presence of some degree of cysto-urethrocele, uterine prolapse, and, or, genito-urinary symptoms does not necessarily preclude an abnormal cystometrogram, as was found to be the case in patients with chronic cystitis, an enterocele, a bladder neck papilloma, marked cerebral arteriosclerosis, and in a patient who

had severe cervical prolapse during pregnancy. Symptoms and physical findings of these patients were not substantially different from those in patients with decompensated bladders.

In patients with chronic cystitis, increased bladder tonicity and decreased volumes at first desire and fullness were found, agreeing with the findings of Youssef (6).

Although a few patients with urinary symptoms and varying degrees of pelvic relaxation had normal cystometrograms, as mentioned above, the majority of patients with these findings (twelve out of eighteen patients in this study) are found to have decompensated bladders. All twelve of these patients had moderate or complete uterine prolapse. The degree of decompensation was, in general, directly proportional to the amount of pelvic relaxation as determined by physical examination.

Of the twelve cases in this study who were surgically treated, five were shown to have no improvement cystometrically, although they had improvement of symptoms and physical findings. This could mean that an operation does not always produce a normal bladder, and that a normal cystometrogram does not always accompany clinical improvement.

In mentally deteriorated patients with mild signs of pelvic relaxation and severe urinary symptoms, a normal cystometrogram may help to determine that the true cause is of a functional nature. These patients may simply have forgotten when they last micturated or they forget to micturate at all, and then complain

of either frequency or incontinence.

From the cases studied, it appears that there is no relationship of the cystometrogram to stress incontinence, although the author has had some subjective feeling that the insertion of the catheter was much easier in patients with stress incontinence than in patients without such symptoms; the catheter would appear to meet with no resistance when being inserted. In one case of stress incontinence, however, a patient who otherwise had a normal cystometrogram (Case 7), was noted to have a leakage around the Foley catheter when about 60 ml. pressure and a full bladder were obtained. This may be as Jeffcoate (7), reports.

SUMMARY

Cystometry, a simple method of examination, has value as a diagnostic procedure to rule out neurologic bladder disorders. In this study, cystometry also showed that the majority of patients with uterine prolapse and varying degrees of cysto-urethrocele have decompensated bladders.

Surgery did not produce normal cystometrograms in all patients, nor did it completely relieve their symptoms; this seems to indicate inadequacy of the surgical procedures used or inability of the tissues to be repaired.

Cystometry, it has been shown, has no relation to the symptom of stress incontinence of urine, if a Foley catheter is used as in this study.

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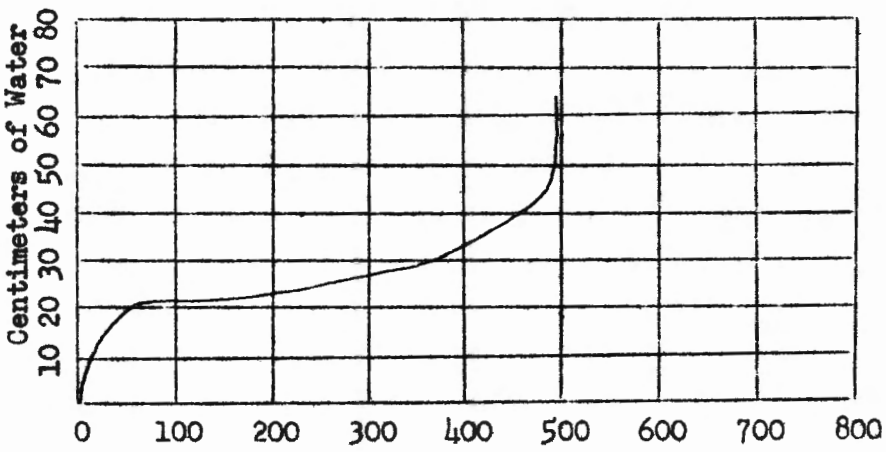
Case No. 1 E. S.

A 40-year-old white woman. Four children.

Recent urinary tract infection. Frequency, backache, urgency and pelvic pressure 3 months duration.

Cystocele, grade II
Rectocele, grade II
Uterine prolapse, grade II



	Pre-operative 1-6-57
Residual Urine	0 ml.
Capacity	450 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Present
Cold	Present
Proprioceptive Sensation:	
First Desire	150 ml.
Fullness	350 ml.

Comment: Normal bladder. Cystitis.

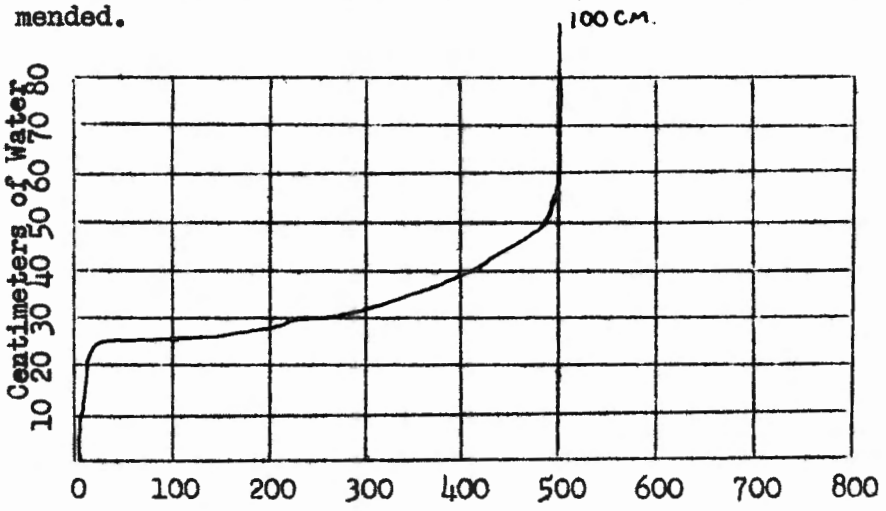
Case No. 2 R. S.

A 30-year-old white woman. Three children.

Stress incontinence since delivery of second child 10 years ago; nocturia, frequency, burning and irritation one year duration; greenish-white vaginal discharge one year duration.

Cystocele, grade II
Urethrocele, grade II
Rectocele, grade II
Dorsal scoliosis
Bronchial asthma

Patient dismissed without operation, pelvic exercises recommended.



	Pre-operative 9-19-56
Residual Urine	40 ml.
Capacity	500 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Present
Cold	Present
Proprioceptive Sensation:	
First Desire	400 ml.
Fullness	500 ml.

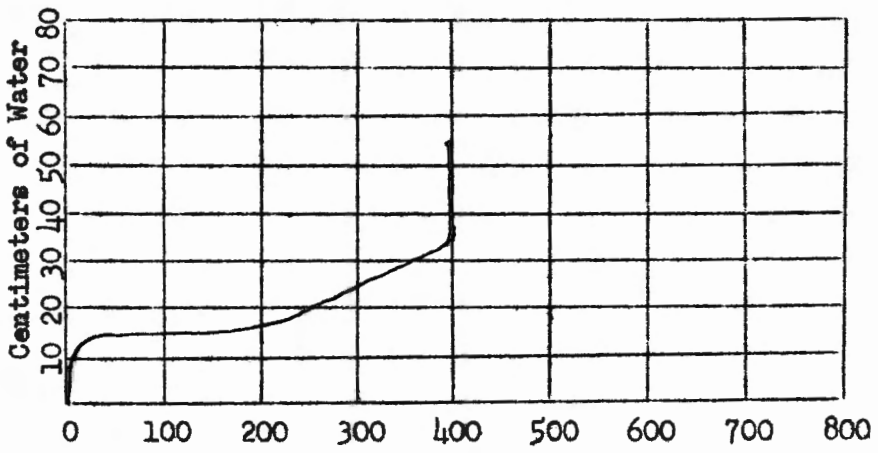
Comment: Normal bladder. Cystitis.

Case No. 3 R. H.

A 42-year-old white woman, 6 children, the largest weighed 7½ lb. at birth. Thyriodectomy 20 years ago.

Frequency, urgency, and nocturia past 7 years.
Dysuria, pain in bladder, low back pain and stress incontinence of urine one year duration.

Cystocele, grade II
Chronic cystitis,
Obesity



	Pre-operative 11-26-56
Residual Urine	40 ml.
Capacity	400 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Present
Cold	Present
Proprioceptive Sensation:	
First Desire	50 ml.
Fullness	200 ml.

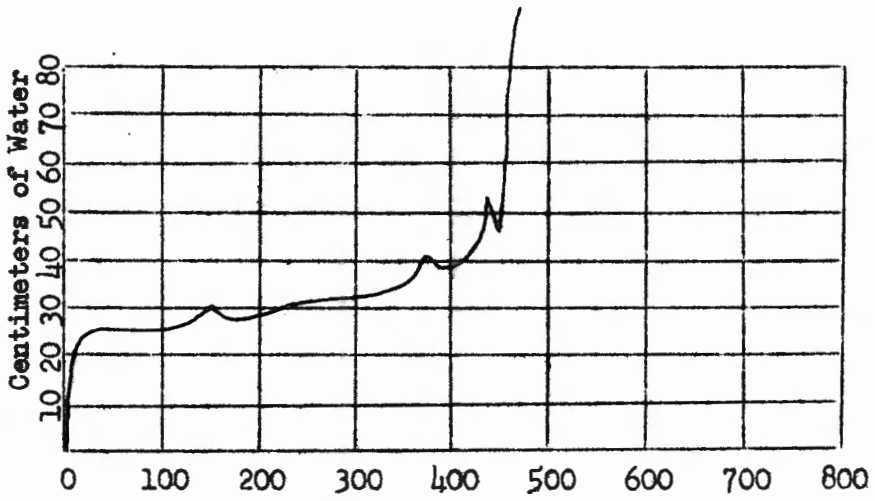
Comment: Normal bladder. Cystitis.

Case No. 4 B. F.

A 52-year-old white woman. Eleven children, the largest weighed 12 lb. at birth. Varicose veins since first pregnancy.

Vaginal bleeding from April to July 1956. Foul smelling vaginal discharge since July 1956. Nocturia, frequency, urgency and stress incontinence of urine for the past several years.

Cysto-urethrocele, grade III
Rectocele, grade II



Volume in Milliliters

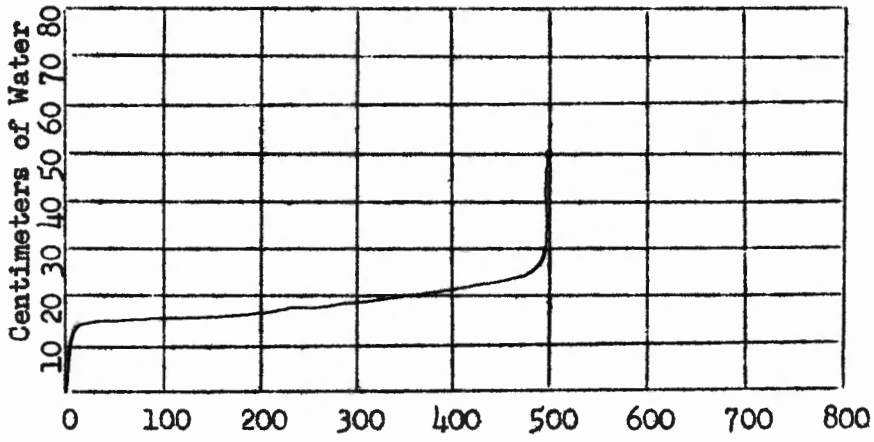
	Pre-operative 10-17-56
Residual Urine	21 ml.
Capacity	465 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Present
Cold	Present
Proprioceptive Sensation:	
First Desire	35 ml.
Fullness	150 ml.

Comment: Normal bladder. Cystitis.

Case No. 5 E. J.

A 59-year-old white woman. Seven children, the largest weighed 11 lb. at birth. Hysterectomy in 1937 for excessive bleeding. Two hemorrhoidectomies and several herniorrhaphies. Perineal plastic repair five years ago which was repeated two times.

No symptoms for 5 years until 4 months ago when she began to have: frequency, nocturia 8 times per night, urgency, burning on urination and stress incontinence of urine.



Volume in Milliliters

	Pre-operative 12-11-56
Residual Urine	40 ml.
Capacity	500 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Present
Cold	Present
Proprioceptive Sensation:	
First Desire	150 ml.
Fullness	250 ml.

Comment: Normal bladder. Cystitis.

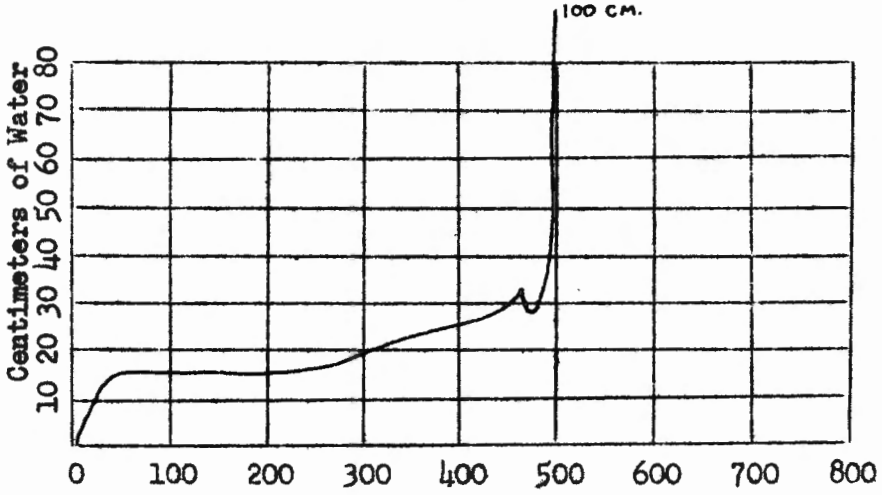
Case No. 6 S. H.

A 29-year-old white woman. Six children.

Falling of pelvic organs and difficulty starting a stream 2 years duration. The cervix protruded past the vagina during her last pregnancy and she delivered a 10 lb. 3 oz. post-mature infant.

Uterine prolapse, grade III
Cystocele, grade III
Rectocele, grade II

10-3-56 Vaginal hysterectomy with anterior-posterior colporrhaphy
10-7-56 Patient signed herself out of hospital.



	Pre-operative 10-2-56
Residual Urine	25 ml.
Capacity	500 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Present
Cold	Present
Proprioceptive Sensation:	
First Desire	225 ml.
Fullness	500 ml.

Comment: Normal bladder.

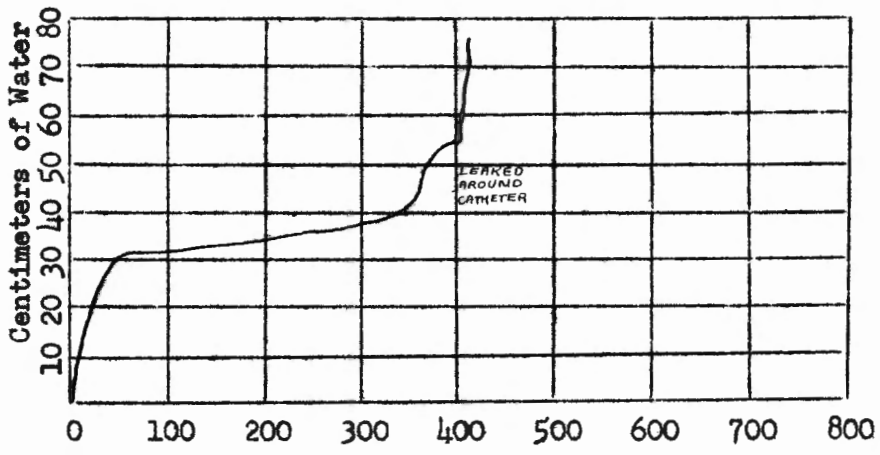
Case No. 7 M. J.

An 82-year-old white woman. Nine children.

Falling of womb for the past 6 years. She wore a pessary for a short period two years ago. Frequency, nocturia, urgency and stress incontinence two years duration.

Uterine prolapse, grade II
Cystocele, grade II
Rectocele, grade II
Intraductal carcinoma of the left breast
Marked cerebral arteriosclerosis

10-27-56 Vaginal hysterectomy with anterior-posterior colporrhaphy.



Volume in Milliliters

	Pre-operative 10-10-56
Residual Urine	5 ml.
Capacity	400 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Present
Cold	Present
Proprioceptive Sensation:	
First Desire	275 ml.
Fullness	375 ml.

Comment: Normal bladder.

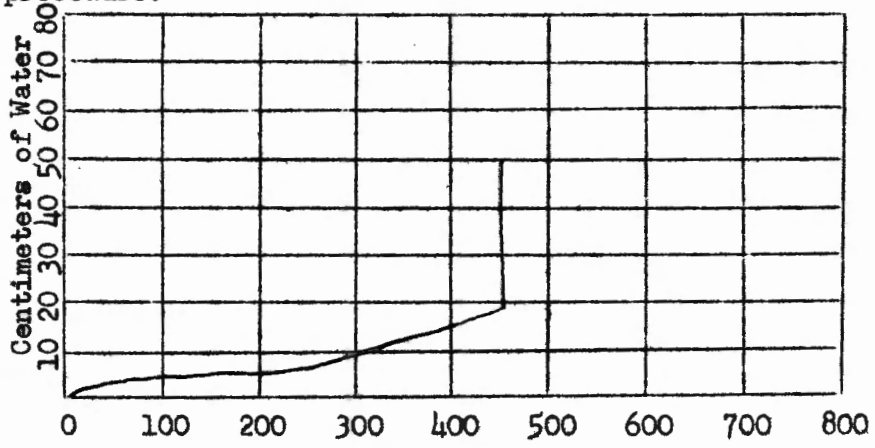
Case No. 8 B. L.

A 54-year-old white woman. Two children.

Uterine suspension and vaginal plastic operation 29 years ago. Cystitis and lioyoma with sub-total hysterectomy two years ago. Burning in the bladder region, especially after urination, frequency, nocturia, difficulty starting a stream, without suprapubic pressure, and a feeling that the bladder is never empty for the past two years.

Cystocele, grade I
Rectocele and enterocele, grade III
Small papilloma of bladder neck.

9-18-56 Excision of cervical stump, enterocele repair, Marchette procedure.



	Pre-operative 9-7-56
Residual Urine	35 ml.
Capacity	450 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Present
Cold	Present
Proprioceptive Sensation:	
First Desire	125 ml.
Fullness	350 ml.

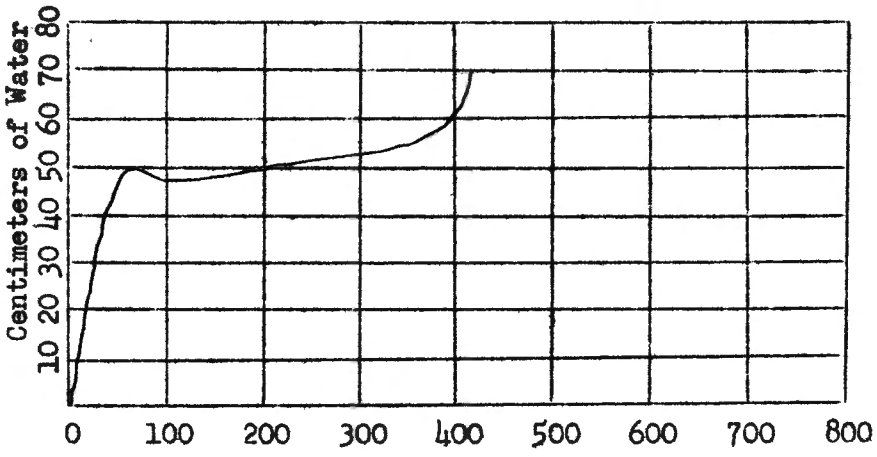
Comment: Normal bladder.

Case No. 9 P. W.

A 70-year-old white woman. Three children weighing 5, 8, and 9 lb at birth.

Falling of tissue from the vagina for three years. Vaginal hysterectomy in 1952. Patient was well for one year and then a mass began to protrude from the vagina.

Enterocele, grade IV



Volume in Milliliters

	Pre-operative 11-8-56
Residual Urine	7 ml.
Capacity	410 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Present
Cold	Present
Proprioceptive Sensation:	
First Desire	125 ml.
Fullness	200 ml.

Comment: Normal bladder.

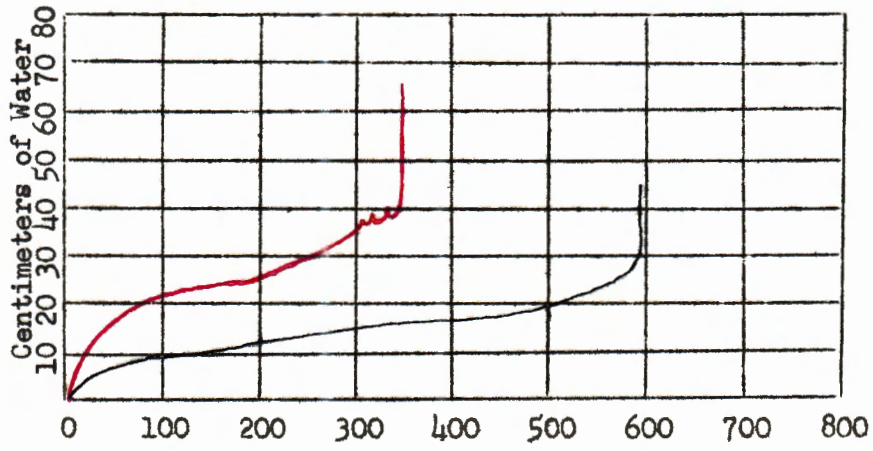
Case No. 10 R. B.

A 72-year-old white woman. Two children weighing 10½ and 11 at birth.

A mass protruding from the vagina since the birth of her last child in 1909. Unsuccessful operation for support of mass five years after onset of the first symptoms. Patient has worn a pessary since that time. Nocturia. No dysuria or incontinence.

Uterine prolapse, grade IV
Rectocele, grade II
Enterocele, grade I

9-10-56 Vaginal hysterectomy with anterior and posterior colporrhaphy.



	Pre-operative 9-8-56	Post-operative 10-3-56
Residual Urine	20 ml.	5 ml.
Capacity	600 ml.	350 ml.
Uninhibited Contractions	None	None
Bulbocavernous Reflex	Present	Present
Extroceptive Sensation:		
Heat	Present	Present
Cold	Present	Present
Proprioceptive Sensation:		
First Desire	300 ml.	225 ml.
Fullness	600 ml.	300 ml.

Comment: Decompensated bladder improved by operation. Normal post-operative bladder function.

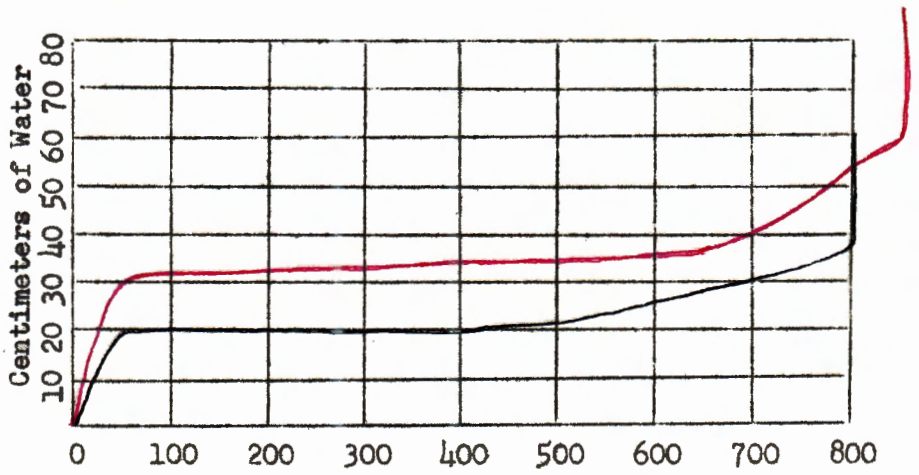
Case No. 11 B. V.

A 38-year-old white woman. Four children, the largest weighed 8½ lb. at birth.

Stress incontinence of urine, frequency, urgency, and nocturia 3 years.

Cystocele, grade II
Rectocele, grade II
Urethrocele, grade II
Chronic cervicitis

9-10-56 Marchetti procedure with excision of a left ovarian cyst.



	Pre-operative 9-8-56	Post-operative 10-26-56
Residual Urine	45 ml.	10 ml.
Capacity	800 ml.	850 ml.
Uninhibited Contractions	None	None
Bulbocavernous Reflex	Present	Present
Extroceptive Sensation:		
Heat	Present	Present
Cold	Present	Present
Proprioceptive Sensation:		
First Desire	200 ml.	270 ml.
Fullness	600 ml.	580 ml.

Comment: Decompensated bladder with no post-operative improvement.

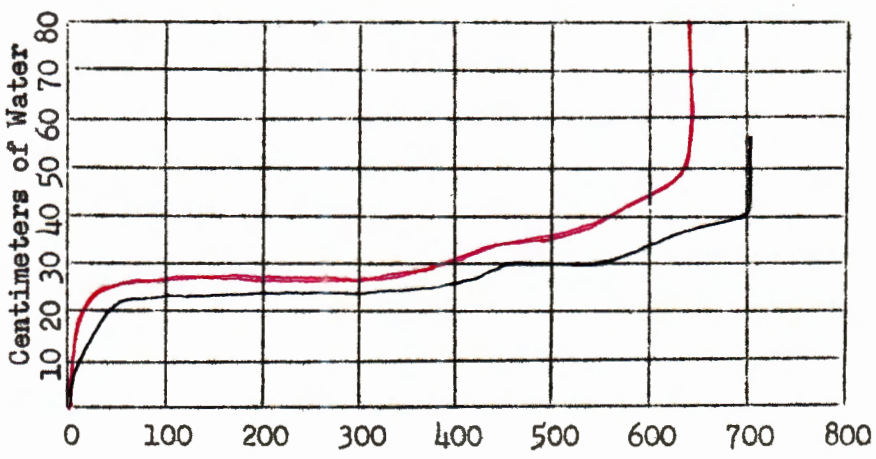
Case No. 12 A. V.

A 63-year-old white woman. Ten children, the largest weighed 11 3/4 lb. at birth.

Frequency, nocturia, difficulty starting a stream, stress incontinence of urine and a mass protruding from the vagina one year duration.

Cystocele, grade III
Rectocele, grade II
Uterine prolapse, grade II

9-12-56 Vaginal hysterectomy with anterior and posterior colporrhaphy.



	Pre-operative 9-11-56	Post-operative 10-19-56
Residual Urine	20 ml.	2 ml.
Capacity	700 ml.	640 ml.
Uninhibited Contractions	None	None
Bulbocavernous Reflex	Present	Present
Extroceptive Sensation:		
Heat	Present	Present
Cold	Present	Present
Proprioceptive Sensation:		
First Desire	500 ml.	100 ml.
Fullness	650 ml.	340 ml.

Comment: Decompensated bladder, improved by operation.

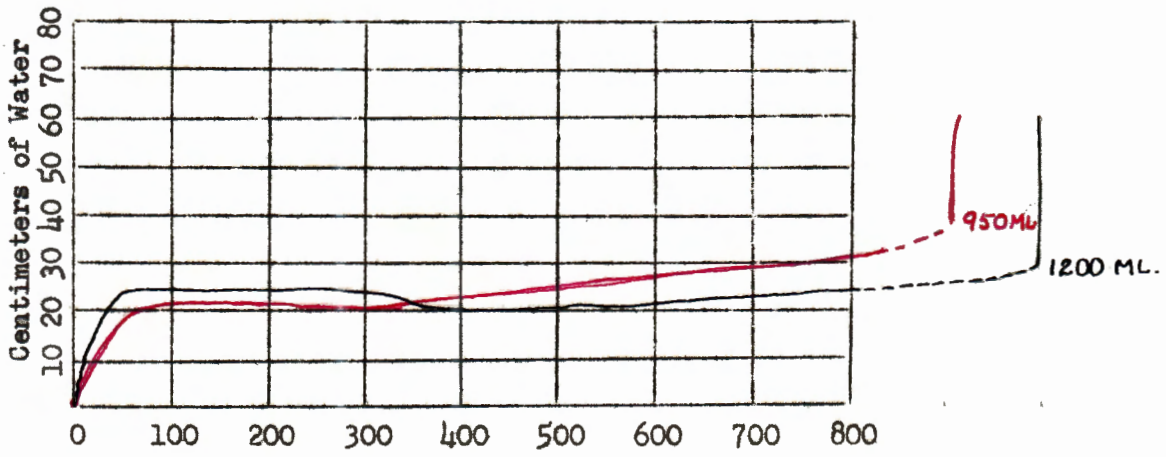
Case No. 13 I. M. B.

A 76-year-old woman. Three children.

Gradual uterine descent past 25 years and difficulty starting a stream. No nocturia, urgency, frequency or stress incontinence.

Uterine prolapse, grade IV
Rectocele, grade II

9-15-56 Vaginal hysterectomy with anterior and posterior colporrhaphy.



Volume in Milliliters

	Pre-operative 9-13-56	Post-operative 10-8-56
Residual Urine	40 ml.	60 ml.
Capacity	1200 ml.	950 ml.
Uninhibited Contractions	None	None
Bulbocavernous Reflex	Present	Present
Extroceptive Sensation:		
Heat	Present	Present
Cold	Present	Present
Proprioceptive Sensation:		
First Desire	700 ml.	225 ml.
Fullness	1100 ml.	750 ml.

Comment: Decompensated bladder improved by operation.

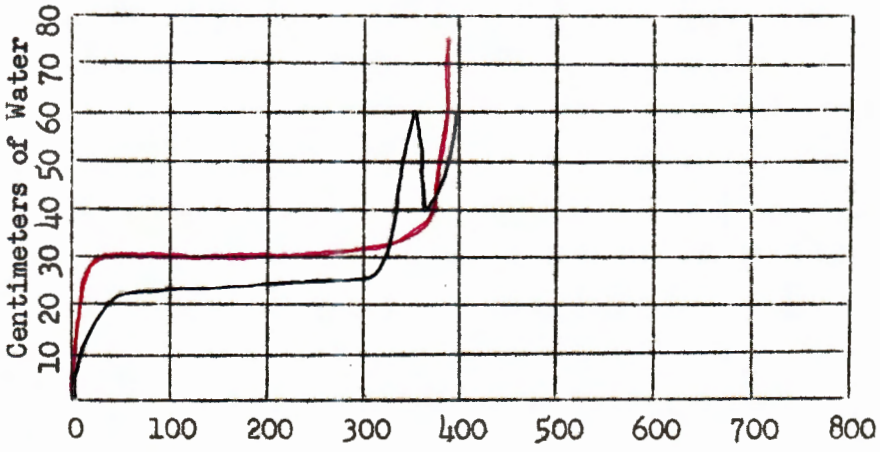
Case No. 14 A. C.

A 72-year-old white woman. Three Children.

Frequency and nocturia for the past ten years. Urgency, incontinence of urine when cold and a mass protruding from the vagina for 6 months.

Uterine prolapse, grade IV

9-22-56 Vaginal hysterectomy with anterior and posterior colporrhaphy.



	Pre-operative 9-19-56	Post-operative 1-9-57
Residual Urine	125 ml.	11 ml.
Capacity	400 ml.	380 ml.
Uninhibited Contractions	None	None
Bulbocavernous Reflex	Present	Present
Extroceptive Sensation:		
Heat	Present	Present
Cold	Present	Present
Proprioceptive Sensation:		
First Desire	300 ml.	300 ml.
Fullness	350 ml.	350 ml.

Comment: Decompensated bladder improved by operation.
Normal post-operative bladder.

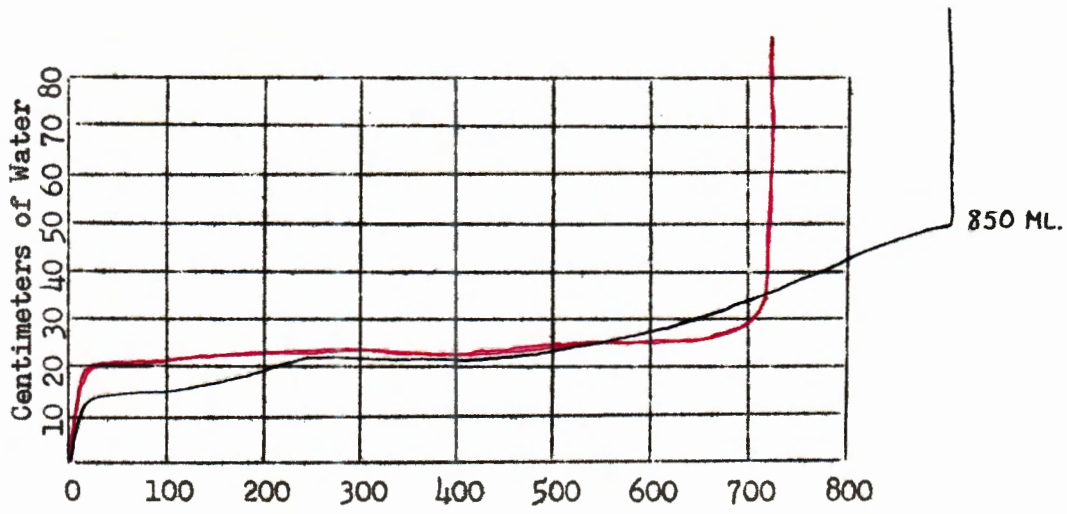
Case No. 15 E. J. C.

A 67-year-old white woman. Seven children.

Frequency, nocturia, pressure in pelvis, frequent bladder infections and stress incontinence of urine 40 years duration.

Cysto-urethrocele, grade II
Rectocele, grade II
Uterine prolapse, grade II

10-10-56 Anterior colporrhaphy.



Volume in Milliliters

	Pre-operative 10-5-56	Post-operative 11-26-56
Residual Urine	115 ml.	200 ml.
Capacity	850 ml.	750 ml.
Uninhibited Contractions	None	None
Bulbocavernous Reflex	Present	Present
Extroceptive Sensation:		
Heat	Present	Present
Cold	Present	Present
Proprioceptive Sensation:		
First Desire	150 ml.	100 ml.
Fullness	500 ml.	375 ml.

Comment: Decompensated bladder improved by operation.

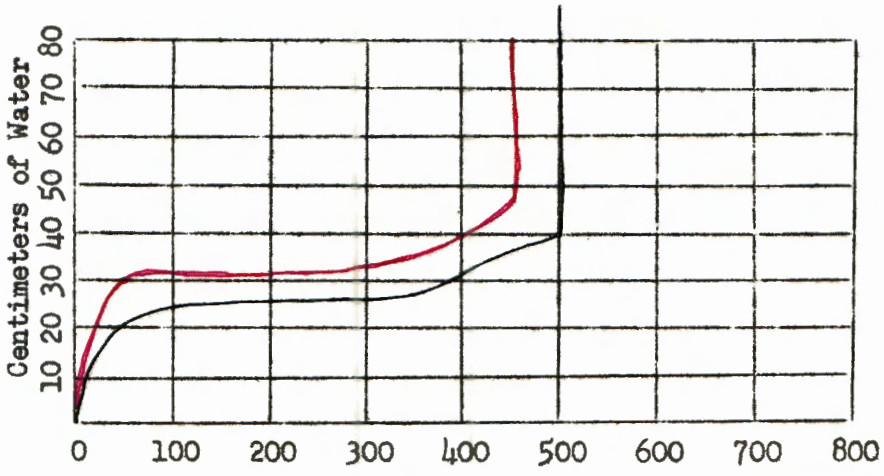
Case No. 16 M. W.

A 67-year-old colored nulliparous woman.

Subtotal hysterectomy in her late thirties for fibroids, feeling of something dropping into the vagina for 3 years, frequency and nocturia the past year, and diabetes for 2 months.

Prolapse of the cervix, grade III
Cystocele, grade II
Urethrocele, grade II
Rectocele, grade I

10-13-56 Excision of cervical stump, anterior and posterior colporrhaphy



	Pre-operative 10-8-56	Post-operative 11-2-56
Residual Urine	140 ml.	25 ml.
Capacity	500 ml.	450 ml.
Uninhibited Contractions	None	None
Bulbocavernous Reflex	Present	Present
Extroceptive Sensation:		
Heat	Present	Present
Cold	Present	Present
Proprioceptive Sensation:		
First Desire	150 ml.	150 ml.
Fullness	400 ml.	250 ml.

Comment: Decompensated bladder improved by operation.
Normal post-operative bladder

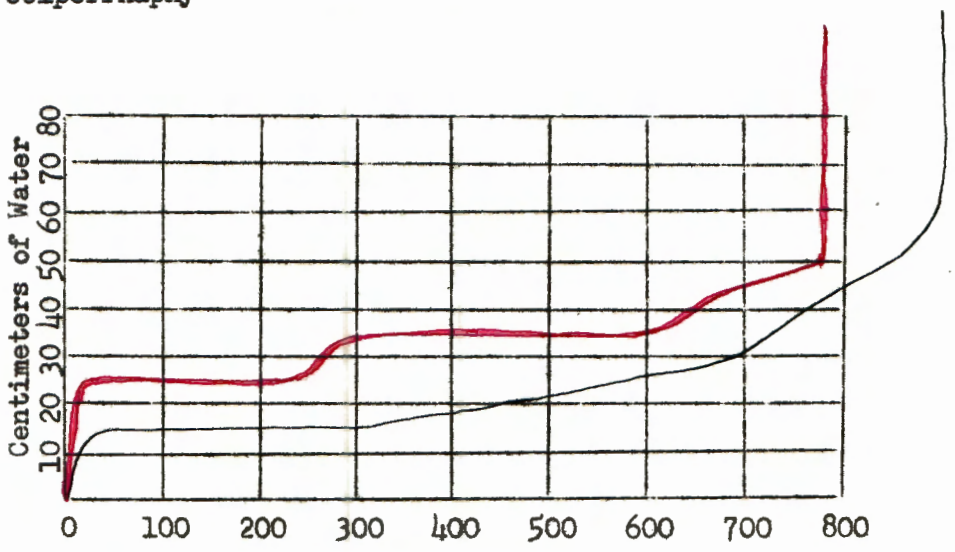
Case No. 17 V. B.

A 37-year-old white woman. Six children.

Dropping of pelvic organs for 6 years, heavy and irregular vaginal bleeding for the past 4 months, frequency, nocturia and urgency for the past 3 months.

Cystocele, grade II
Rectocele, grade II
Uterine prolapse, grade III

10-15-56 Vaginal hysterectomy with anterior and posterior colporrhaphy



	Pre-operative 10-12-56	Post-operative 12-7-56
Residual Urine	50 ml.	0 ml.
Capacity	850 ml.	750 ml.
Uninhibited Contractions	None	None
Bulbocavernous Reflex	Present	Present
Extroceptive Sensation:		
Heat	Present	Present
Cold	Present	Present
Proprioceptive Sensation:		
First Desire	225 ml.	250 ml.
Fullness	425 ml.	650 ml.

Comment: Decompensated bladder improved by operation.

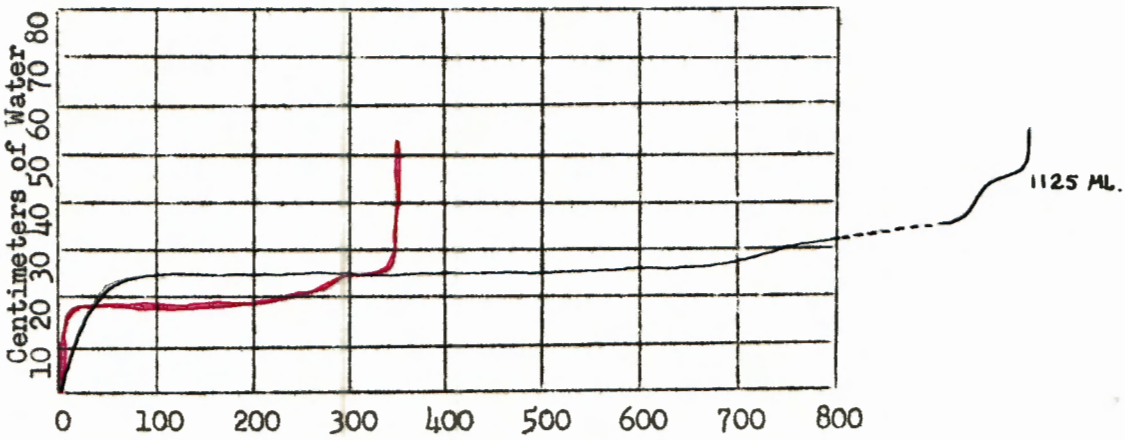
Case No. 18 M. H.

A 69-year-old white woman. Three children.

Chronic pyelonephritis for 20 years, nocturia and frequency. History is unreliable.

Uterine prolapse, grade IV
Chronic pyelonephritis,
Non-functioning left kidney with laminated calculus
Psychosis with mental deficiency

11-19-56 Vaginal hysterectomy with anterior and posterior colporrhaphy



Volume in Milliliters

	Pre-operative 11-8-56	Post-operative 12-6-56
Residual Urine	9 ml.	44 ml.
Capacity	1125 ml.	350 ml.
Uninhibited Contractions	None	None
Bulbocavernous Reflex	Present	Present
Extroceptive Sensation:		
Heat	Present	Present
Cold	Present	Present
Proprioceptive Sensation:		
First Desire	500 ml.	0 ml.
Fullness	600 ml.	150 ml.

Comment: Decompensated bladder improved by operation
Normal post-operative bladder

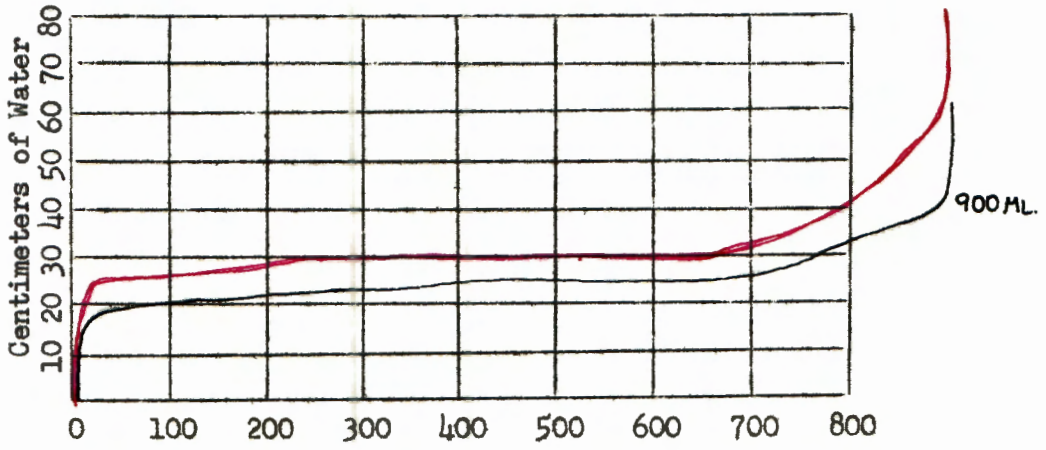
Case No. 19 J. G.

A 71-year-old white woman. Three children, all weighed 10 lb. at birth.

Falling of womb to entroitus for 20 years. A pessary worn for the past 6 years caused much irritation. Stress incontinence when she is cold.

Uterine prolapse, grade III
Rectocele, grade III

11-29-56 Anterior and posterior colporrhaphy



Volume in Milliliters

	Pre-operative 11-26-56	Post-operative 1-10-57
Residual Urine	13 ml.	7 ml.
Capacity	900 ml.	900 ml.
Uninhibited Contractions	None	None
Bulbocavernous Reflex	Present	Present
Extroceptive Sensation:		
Heat	Present	Present
Cold	Present	Present
Proprioceptive Sensation:		
First Desire	250 ml.	400 ml.
Fullness	400 ml.	700 ml.

Comment: Decompensated bladder not improved by operation

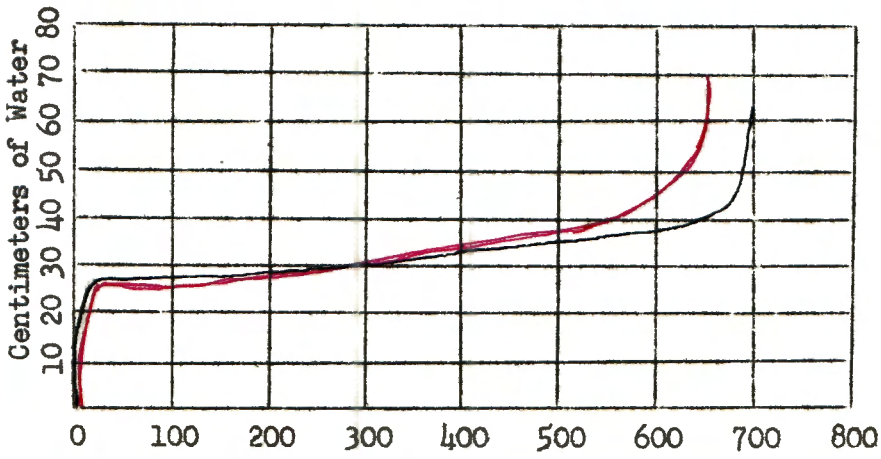
Case No. 20 M. L.

A 57-year-old white woman. Two children.

Tissue protruding from the vagina 8 to 10 years. Stress incontinence of urine and difficulty starting a stream until the uterus is replaced.

Uterine prolapse, grade IV

12-10-56 Vaginal hysterectomy with anterior and posterior colporrhaphy



	Pre-operative 12-7-56	Post-operative 2-12-57
Residual Urine	2 ml.	3 ml.
Capacity	700 ml.	650 ml.
Uninhibited Contractions	None	None
Bulbocavernous Reflex	Present	Present
Extroceptive Sensation:		
Heat	Present	Present
Cold	Present	Present
Proprioceptive Sensation:		
First Desire	325 ml.	250 ml.
Fullness	450 ml.	550 ml.

Comment: Decompensated bladder with slight post-operative improvement

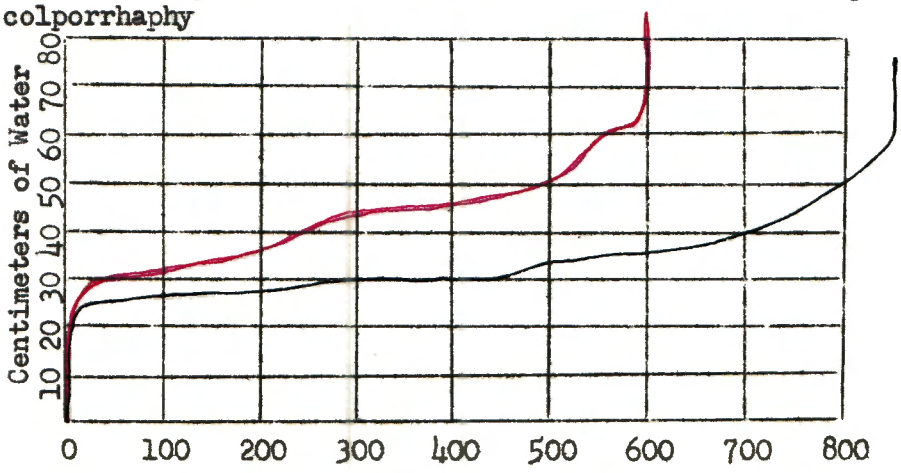
Case No. 21 R. L.

A 79-year-old white woman with 7 children. Uterus partially cut off in 1936 and a perineal repair in 1937.

Falling of womb for 15 years with falling of womb completely out of the vagina for the past 5 weeks. Urgency, stress incontinence of urine and difficulty starting a stream. Diabetes for 4 years.

Uterine prolapse, grade IV
Rectocele, grade II
Diabetes mellitus
Rheumatoid arthritis

12-18-56 Amputation of the cervix with anterior and posterior colporrhaphy



	Pre-operative 12-11-56	Post-operative 2-7-57
Residual Urine	45 ml.	13 ml.
Capacity	850 ml.	600 ml.
Uninhibited Contractions	None	None
Bulbocavernous Reflex	Present	Present
Extroceptive Sensation:		
Heat	Present	Present
Cold	Present	Present
Proprioceptive Sensation:		
First Desire	570 ml.	300 ml.
Fullness	800 ml.	550 ml.

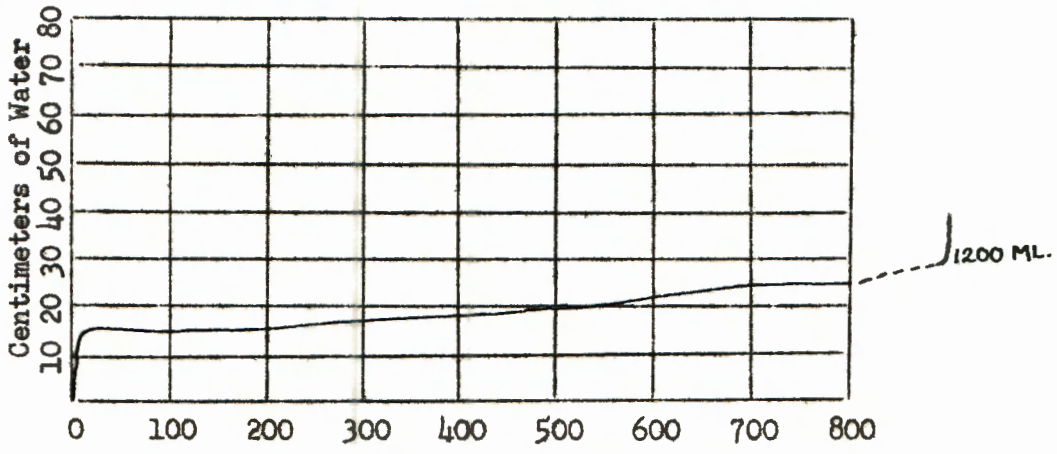
Comment: Decompensated bladder improved by operation

Case No. 22 M. D.

A 41-year-old white woman with 2 children who had an anterior-posterior colporrhaphy in May 1955.

Incontinence of urine before she has an urge to void. Onset related to delivery of last child 12 years ago. Patient was relieved of symptoms for a few months after operation but incontinence has returned.

Good perineal repair
No cysto-urethrocele



	12-5-56
Residual Urine	5 ml.
Capacity	1200 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Present
Cold	Present
Proprioceptive Sensation:	
First Desire	360 ml.
Fullness	850 ml.

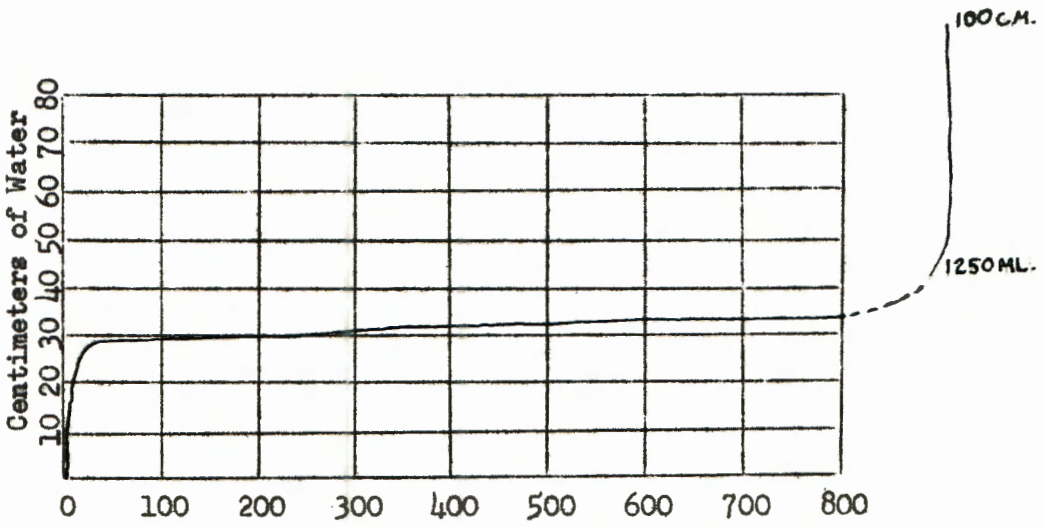
Comment: Chronically decompensated bladder.

Case No. 23 R. H.

A 39-year-old white man.

Acute urinary retention 2 weeks ago with cystitis.

Mental retardation
Megacolon
Obesity
Absent left testicle
Left esotropia



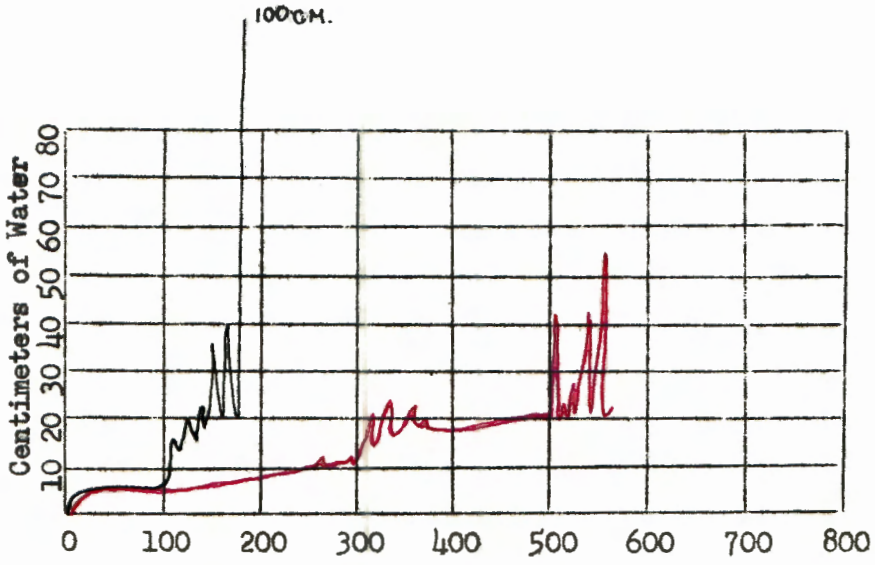
	12-21-56
Residual Urine	300 ml.
Capacity	1250 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Present
Cold	Absent
Proprioceptive Sensation:	
First Desire	400 ml.
Fullness	550 ml.

Comment: Normal nervous function. Decompensated bladder.

Case No. 24 M. R.

A 25-year-old white woman with narcolepsy and catalepsy seven years duration. Enuresis 3 years duration starting one month after marriage and with complete remission during 2 pregnancies.

No physical findings
Completely normal neurological examination



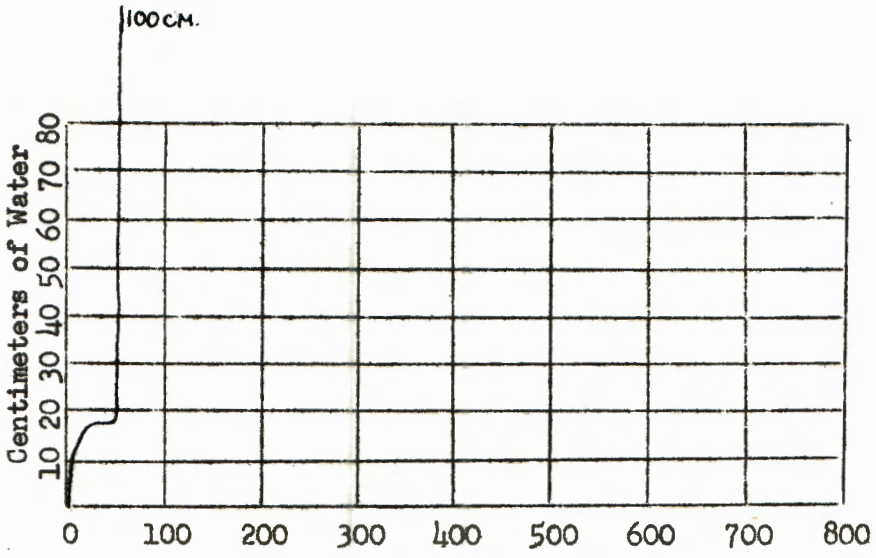
	No Medication 11-17-56	Pro-banthine
Residual Urine	0 ml.	0 ml.
Capacity	Not reached	550 ml.
Uninhibited Contractions	Present	Present
Bulbocavernous Reflex	Present	Present
Extroceptive Sensation:		
Heat	Present	Present
Cold	Present	Present
Proprioceptive Sensation:		
First Desire	100 ml.	150 ml.
Fullness	180 ml.	550 ml.

Comment: Uninhibited neurogenic bladder.
Pro-banthine 30 mg. intra-venously. Motor paralytic bladder. Completely controlled on Pro-banthine 150 mg. q.d.

Case No. 25 J. A.

A young man with a cervical cord injury from a swimming accident.

An external condrom catheter is in place.



10-14-56

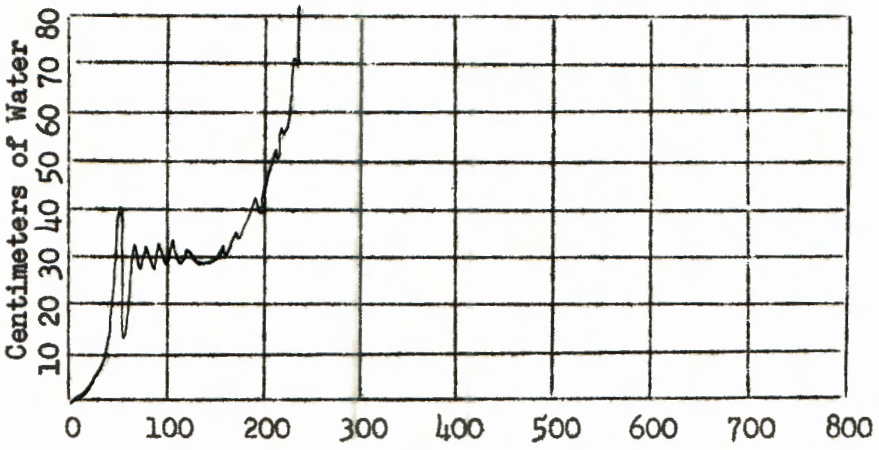
Residual Urine	Unable to void
Capacity	60 ml.
Uninhibited Contractions	Present
Bulbocavernous Reflex	Not tested
Extroceptive Sensation:	
Heat	Absent
Cold	Present
Proprioceptive Sensation:	
First Desire	None
Fullness	None

Comment: Uninhibited neurogenic bladder

Case No. 26 R. M.

A young man with a cervical cord injury from a swimming accident.

Supra-public cystostomy



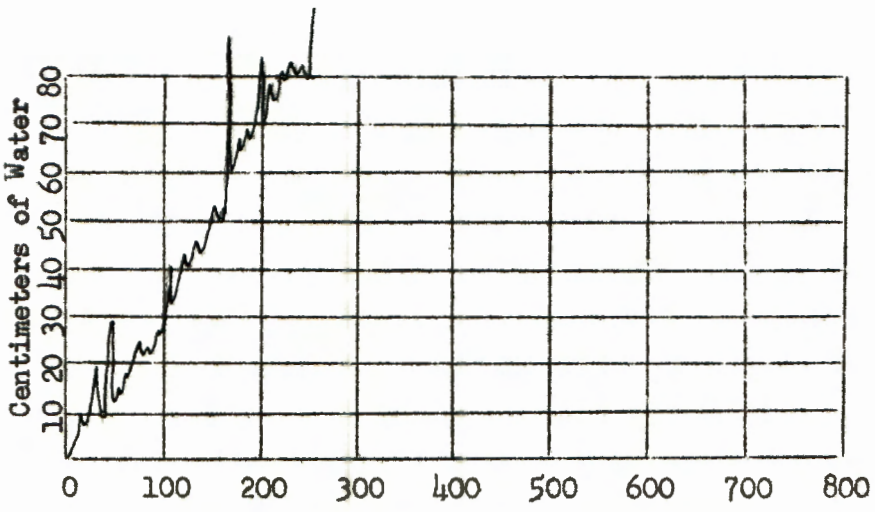
10-13-56

Residual Urine	Unable to void
Capacity	210 ml.
Uninhibited Contractions	Present
Bulbocavernous Reflex	Absent
Extroceptive Sensation:	
Heat	Absent
Cold	Absent
Proprioceptive Sensation:	
First Desire	None
Fullness	None

Comment: Reflex neurogenic bladder.

Case No. 27 H. M.

A 26-year-old white man. Cervical cord injury as a result of an auto accident.



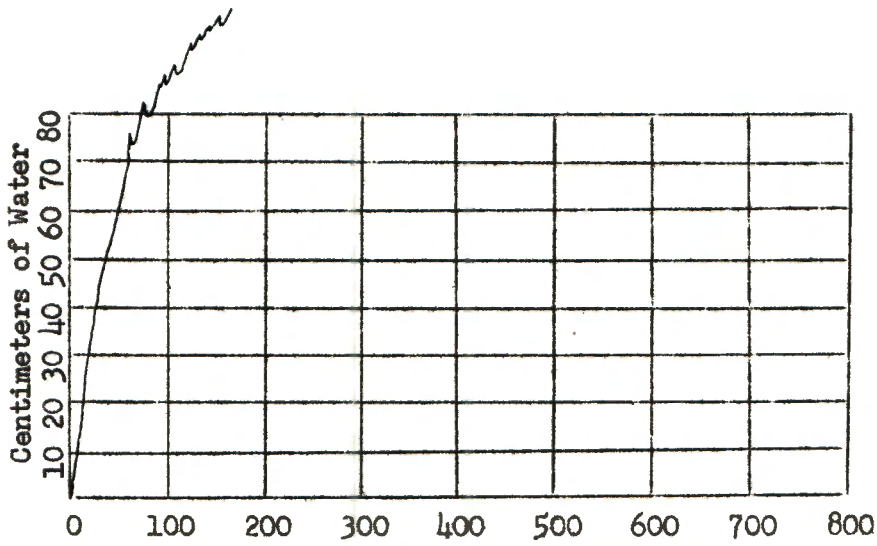
10-14-56

Residual Urine	Unable to void
Capacity	250 ml.
Uninhibited Contractions	Present
Bulbocavernous Reflex	Absent
Extroceptive Sensation:	
Heat	Absent
Cold	Absent
Proprioceptive Sensation:	
First Desire	None
Fullness	None

Comment: Reflex neurogenic bladder.

Case No. 28 D. H.

A 26-year-old white man. Sixth cervical vertabra fracture and cervical cord injury in July 1954. He has automatic voiding of urine.



11-16-56

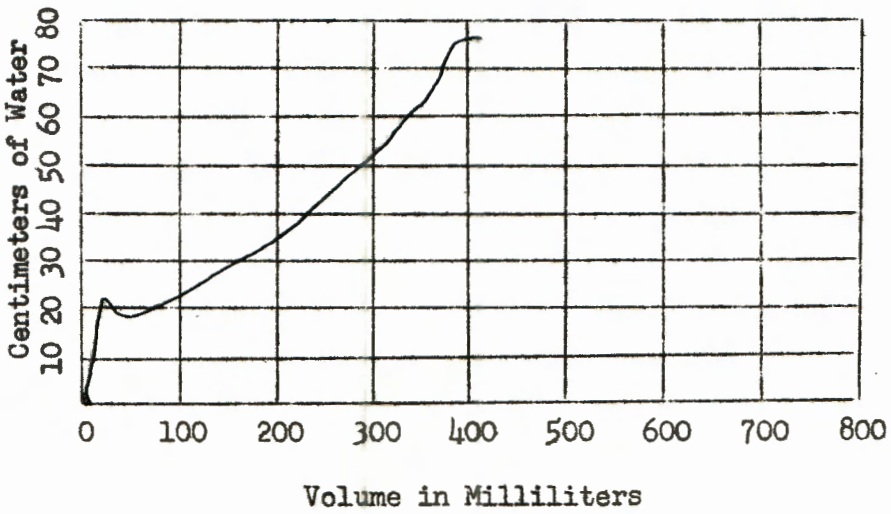
Residual Urine	Unable to void
Capacity	150 ml.
Uninhibited Contractions	Present
Bulbocavernous Reflex	Absent
Extroceptive Sensation:	
Heat	Absent
Cold	Absent
Proprioceptive Sensation:	
First Desire	None
Fullness	None

Comment: Reflex neurogenic bladder

Case No. 29 E. K.

A 55-year-old white man, operated for a spina bifida March 1956, which was followed by partial paralysis of both legs, urinary retention and over-flow incontinence. He attempted suicide in July 1956 by shooting; the bullet entered through the inner canthus of the right eye and lodged inside the left parietal bone. He has since had cerebro-spinal fluid drainage, periods of confusion, aphasia and hyperpyrexia to 104.8°.

11-5-56 Craniotomy and repair of pneumocele
11-14-56 Trans-urethral resection
11-28-56 Trans-urethral resection



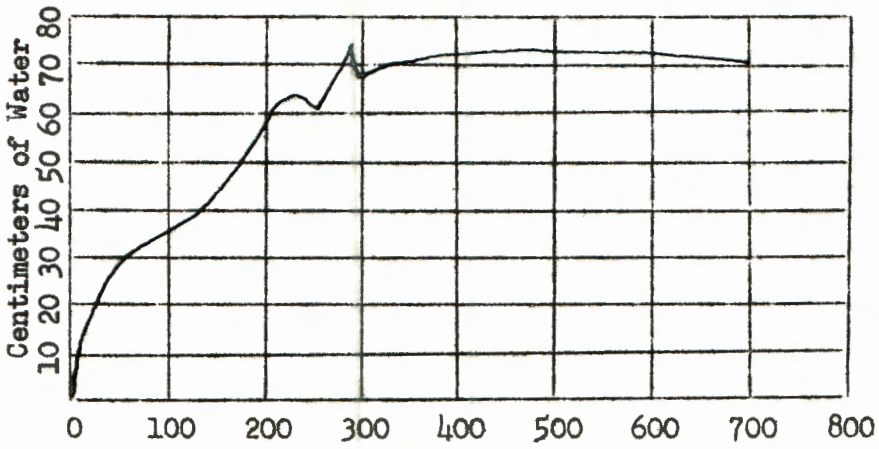
11-13-56

Residual Urine	Unable to void
Capacity	Not reached
Uninhibited Contractions	None
Bulbocavernous Reflex	Absent
Extroceptive Sensation:	
Heat	Absent
Cold	Absent
Proprioceptive Sensation:	
First Desire	140 ml.
Fullness	350 ml.

Comment: Autonomous neurogenic bladder

Case No. 30 O. G.

A young man with idiopathic spinal cord degeneration.



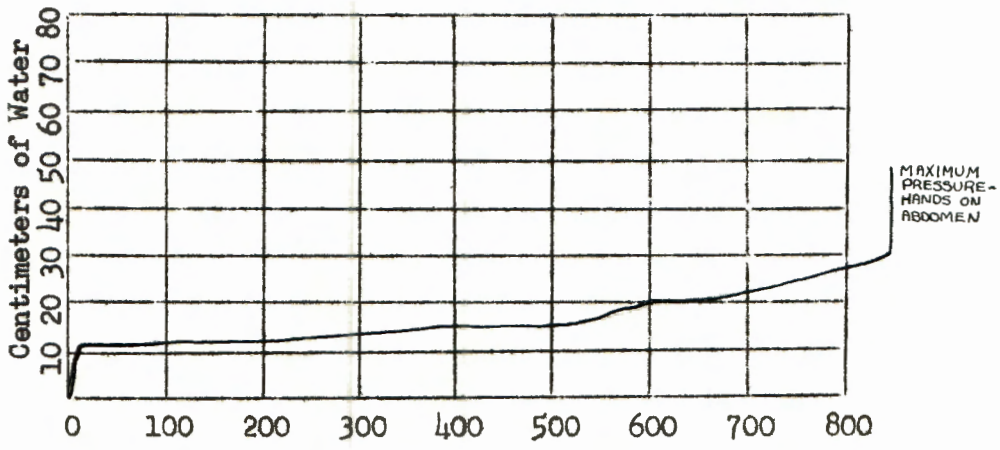
10-26-56

Residual Urine	Unable to void
Capacity	Not reached
Uninhibited Contractions	None
Bulbocavernous Reflex	Absent
Extroceptive Sensation:	
Heat	Absent
Cold	Absent
Proprioceptive Sensation:	
First Desire	None
Fullness	None

Comment: Autonomous neurogenic bladder

Case No. 31 H. T.

A 53-year-old white woman with stress incontinence since the birth of a child in 1934. Watkins interposition operation in 1948 for uterine prolapse with no improvement. She now can not walk any distance without losing urine. She has urgency--when she has a full feeling, she must void immediately. She states that it takes her longer to void than others. Nocturia once per night.



Volume in Milliliters

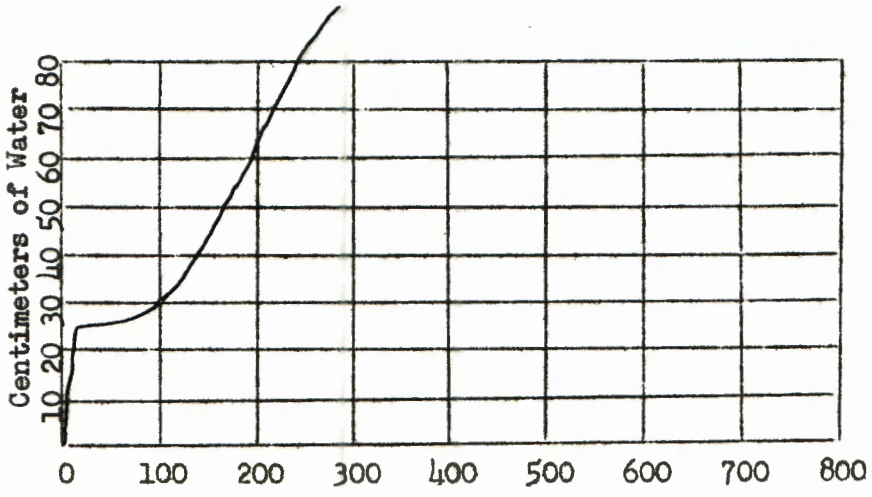
	1-15-57
Residual Urine	9 ml.
Capacity	850 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Absent
Cold	Absent
Proprioceptive Sensation:	
First Desire	None
Fullness	500 ml.

Comment: Sensory paralytic bladder

Case No. 32 A. H.

An 82-year-old white man who had a stroke in 1955 and one five weeks before test with no paralysis but with a psychic effect. Two weeks after the stroke he began to have urinary retention and has since required continuous catheterization

Cystoscopy shows only slight obstruction.

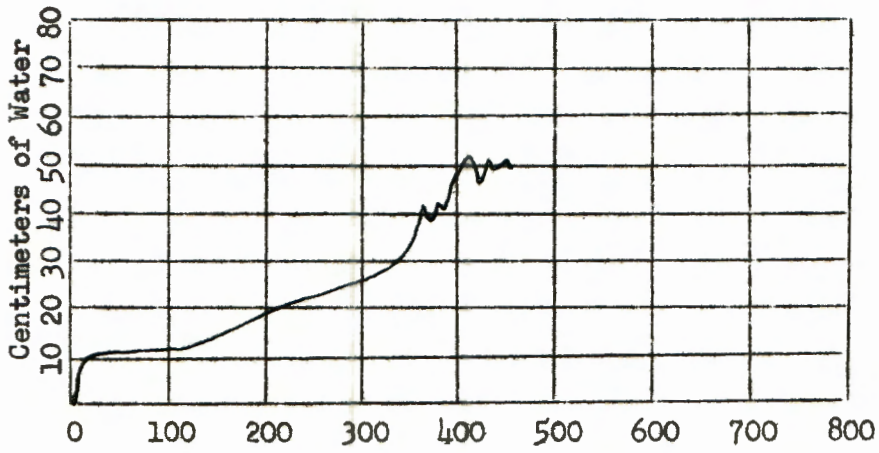


	12-6-56
Residual Urine	Unable to void
Capacity	275 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Absent
Cold	Absent
Proprioceptive Sensation:	
First Desire	175 ml.
Fullness	None

Comment: Motor paralytic bladder with reduced capacity due to long duration of catheterization.

Case No. 33 E. C.

A 73-year-old white man who was operated for trigeminal neuralgia on 1-31-57. Urinary retention followed. He has had bouts of retention before.



	2-17-57
Residual Urine	Unable to void
Capacity	450 ml.
Uninhibited Contractions	None
Bulbocavernous Reflex	Present
Extroceptive Sensation:	
Heat	Absent
Cold	Absent
Proprioceptive Sensation:	
First Desire	200 ml.
Fullness	360 ml.

Comment: Patient had severe discomfort at 450 ml.
Motor paralytic bladder