Examination.—Large r. kidney; tender over r. kidney region; cystoscope; general injection; several areas gran. tissue, which bled easily; a large ulcer near r. uret. orifice; bladder urine contained pus, blood, epithelia, casts and t. b.; guinea-pig test positive; r. uret. urine contained pus, blood, epithelia, casts and t. b. in large numbers; l. uret. urine neg.

Parts Involved.—Bladder; r. kidney; from history, probably primary in kidney.

Treatment.—R. nephrect. June 20, 1896; cautery of whole bladder under ether, with pure silv. nit., July 10, 1896; grt. relief; urination dropped from 40 t. d. to 4 t. d. in one week; perm. potass. irrigations until May, 1897, not efficacious; in August, 1897, getting irritable again; Oct. 2, 1897, cautery of tuberc. and red patches with galv. cautery; made worse; Guyon treatment, February, 1898, until April, 1899; no improvement; artificial vesico-vaginal fistula, April 25, 1899; cease Guyon treatment; comfort; from now until March, 1904, boric acid irrig.; occasional applications of pure silv. nit. and injections of ichthyol and glycerin, March 12, 1904; Guyon treatment resumed and continued until Oct. 24, 1904, when fistula was closed, with success; patient has been completely well ever since; no pyuria; no vesical irritability.

Remarks.—Cure could have been effected sooner had Guyon treatment been instituted at time fistula was made.

Date of Last Note.—Patient has been well 2 years.

URINARY INCONTINENCE.

THE TREATMENT OF CERTAIN FORMS BY THE FORMATION OF A VESICO-VAGINO-RECTAL FISTULA, COMBINED WITH CLOSURE OF THE INTROITUS VAGINÆ.*

REUBEN PETERSON, M.D.
ANN ARBOR, MICH.

Incontinence of urine in the woman is usually due to a vesico-vaginal fistula. The ordinary varieties of such fistulæ are easily cured by plastic surgery if modern methods be employed. Even large fistulæ involving a considerable portion of the vesico-vaginal septum and surrounded by dense scar tissue can be successfully closed by loosening the attachments of the bladder, separating this viscus from the vaginal wall and closing the rent in the bladder wall by a separate suture. But there always will remain cases where the neck of the bladder and portions of the urethra have been so destroyed as to preclude the restoration of the sphincter urinæ muscle, so that continence will be established. Under such circumstances the surgeon must consider the following procedures:

1. He can construct by a plastic operation an urethra which will serve as a channel for the urine, but leaves the patient without control of the stream. This is always an unsatisfactory procedure as far as the patient is concerned. By various devices, such as tamponade of the vagina, the sphincterless urethra may be shut off and the urine controlled to a certain extent. But the patient is never completely satisfied and her dissatisfaction would seem justifiable.

2. He can utilize the rectal sphincter by diverting the urinary stream into the rectum either directly by an anastomosis between the bladder and rectum or indirectly through the formation of a recto-vaginal fistula with a subsequent closure of the introitus vaginæ.

The following case will serve as a text for the discussion of the last-named procedure:

* Read in the Section on Obstetrics and Diseases of Women of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

History.—Mrs. P., aged 60, married, was referred to me by Dr. M. C. Strong, of Jackson. Her present trouble dates back one year, when she began to experience pain, burning and irritation in the neighborhood of the meatus urinarius. The pain was worse when she was on her feet; micturition was quite painful and has become more so recently.

Examination.—On entrance to my private hospital, Oct. 17, 1904, the meatus urinarius was found to be the seat of a growth the size of a cherry. It was dark-red in color and sprang from the upper and lateral walls of the meatus. The growth was somewhat hard and the induration extended up the urethra for about 2 cm. The inguinal glands were not enlarged. A piece of the growth had previously been removed and pronounced malignant by a competent pathologist.

Primary Operation Oct. 17, 1904—Removal of Growth at Meatus Urinarius.—A circular incision was made $1\frac{1}{2}$ cm. outside and beyond the growth. The line of demarcation between the upper normal and lower injected mucosa was plainly visible and was situated about $2\frac{1}{2}$ cm. above the meatus. The urethra was dissected out and amputated about 1 cm. above this point. The urethral mucosa was then stitched with interrupted silkworm-gut sutures to the vestibule. So much of the urethra was removed and the integrity of the muscular structures was so impaired that the expected incontinence followed. From the time of the operation the patient practically had no control over the urine. The amputated urethra healed by primary union and the patient was discharged Nov. 9, 1904.

The patient re-entered the hospital March 18, 1905. The incontinence had continued since the first operation and the patient complained of great soreness and irritation about the site of the operation. Examination showed the remnant of the urethral opening, measuring $1\frac{1}{2}$ cm. in diameter. Through this opening protruded the bladder mucosa, forming an external tumor the size of an English walnut. The bladder mucosa was reddened and at one spot was a superficial ulcer 4 mm. in diameter.

Second Operation March 22, 1905.—Formation of a Vesico-Vaginal Fistula and Closure of the Urethral Opening for the Purpose of Curing a Prolapse of the Bladder.—A centimeter and a half incision was made in the vesico-vaginal septum $2\frac{1}{2}$ cm. above the cervix. The edges of the vesical and vaginal mucosa were united by interrupted catgut sutures. The prolapsed bladder was replaced and the edges of the opening freshened outward for a distance of 2 cm. The clitoris and upper part of the labia minora were removed during this process. The aperture was closed by a continuous catgut suture, the overlying tissues being drawn together laterally by interrupted silkworm-gut sutures. Both wounds healed by primary union and the patient left the hospital April 12, 1905.

The patient consulted me again June 3, 1905, complaining bitterly of the irritation arising from the continual flow of urine from the vagina. Examination showed perfect closure of the urethral opening, with no bulging. There were great reddening and signs of irritation about the vagina, labia and buttocks, arising from the continuous urinary flow. The patient asked that something be done for her relief and elected the following operation after its disadvantages and advantages had been fully explained to her:

Third Operation, June 4, 1905.—Utilization of Rectal Sphincter by the Formation of a Recto-Vaginal Fistula, with a Subsequent Closure of the Introitus Vaginæ.—The sphincter muscle was thoroughly stretched and partially paralyzed. A longitudinal opening, 2 cm. in length, was made in the recto-vaginal septum, just above the internal sphincter. The vaginal and rectal mucosal edges were united by interrupted catgut sutures. The remainder of the labia minora were removed, and the surface about the introitus freshened for a distance of 2 cm. The vagina was closed with interrupted silkworm-gut sutures, care being taken to prevent any strain on the stitches. The rectum was drained by means of a large-sized rubber tube. This tube was removed at the end of four days, after which time the patient passed her urine every two or three hours by way of the rectum, having, of course, perfect control over the urine. The vulva stitches were removed at the end of a week, union by first intention resulting. After

the first few days there was one or two partially formed stools daily. The patient was fairly comfortable on leaving the hospital about three weeks after the operation. She experienced some pain just prior to the passage of the urine per rectum. This she attributed to gas passing upward into the vagina, as it was always relieved by the passage of the urine. The patient had to get up once or twice only in the night and was able to retain the urine about three hours in the day time.

Subsequent History.—The patient was very comfortable for a time. Then she found the urine was not passing freely and that straining and pain were of frequent occurrence. August 13, 1905, she was examined under chloroform, and, as suspected, the recto-vaginal opening was found contracted, thus preventing a free passage of the urine. The opening was now made 4 instead of 2 cm. in length, the work being done through the dilated anal opening. The vagina was carefully palpated and inspected and appeared perfectly normal. A catheter was passed into the bladder by way of the recto-vagino-vesical opening and a small amount of urine collected. Careful chemic and microscopic examinations showed this urine to be perfectly normal. For a time the patient was very comfortable. Then she began to have considerable pain in the region of the bladder and the urine seemed to irritate unless large quantities of water were ingested and internal antiseptics were administered.

March 10, 1906, she was again examined under chloroform. The recto-vaginal opening was patulous and admitted the forefinger with ease. The vesico-vaginal opening, however, was greatly contracted. This was dilated and a calculus 1½ cm. in diameter removed from the bladder. The vesico-vaginal opening was made twice its original size and urine withdrawn from the bladder for examination. Again it was found perfectly normal. The patient has been in good health since the removal of the calculus. The rectum apparently serves very well as a substitute for a bladder. She is able to retain the urine three or four hours and has to get up twice only during the night.

The credit of suggesting the utilization of the rectum and the anal sphincter as a substitute for the bladder and urethra is due to E. Rose. He operated on his first patient in 1872. The vesico-vaginal fistula resulting from the extensive destruction of the bladder wall was transformed into a vesico-vagino-rectal fistula with complete success so far as the rectal urethra was concerned. Death followed ten months later from a nephritis brought about by the previous attack of diphtheria. His second patient was operated on for an incontinence following extensive carcinomatous disease. It was a success so far as the function of the rectal urethra was concerned, but death resulted later from extension of the carcinoma. His third patient was operated on nineteen years before his final report.¹ The patient had had various operations for a vesico-vaginal fistula consecutive to a rupture of the bladder and was given up as incurable. A vagino-rectal fistula was made and the introitus closed. The patient had been employed as a maid of all work during the nineteen years and had been in good health. She not only urinated, but also menstruated through the anus, with no resulting infection, as far as could be observed, of either uterus or urinary tract. The autopsies on the first two patients showed no signs of inflammation in rectum or vagina.

INFECTION AS A SEQUEL OF DIVERTING THE URINE INTO THE INTESTINE.

Fortunately, the surgeon can speak more authoritatively on this point to-day than formerly. The results of experimental and clinical work may be summed up briefly as follows: The urinary stream, either from the ureter or bladder, can be safely diverted into the intes-

tine for the purpose of utilizing the anal sphincter, if the vesical ureteral orifices remain intact. On the other hand, pyelonephritis in varying degrees of intensity always follows the anastomosis of the severed ureter with the intestine. I have gone into this subject at some length in a paper dealing with the anastomosis of the ureters with the intestine, which was published in 1901.² Hence I had no hesitancy, so far as infection was concerned, in advising my patient to submit to an operation for the formation of a rectal urethra. Infection is not to be feared, because in a vesico-vagino-rectal fistula the ureteral orifices remain intact and act as a safeguard against pyelonephritis. There are many cases in the literature where patients have lived for years without signs of kidney lesions after the formation of a vesico-rectal fistula from the passage of a vesical calculus into the rectum. Keen's case is particularly interesting. The introitus was closed for the relief of a patient suffering from a vesico-vagino-rectal fistula. Twenty-two years subsequent to the operation the patient was in perfect health, with no sign of renal infection. Additional proof is furnished by the present case, where two careful examinations of the urine removed months after the operation failed to show any signs of renal infection.

THE PASSAGE OF FECES INTO THE VAGINA.

I do not believe that this occurs to any great extent. Contrary to expectation, patients with rectal urethras do not suffer from diarrhea. They have one or two well-formed stools daily. Consequently the tendency of the fecal matter is to pass by the recto-vaginal opening. In my experience patients with recto-vaginal fistulae are not so much annoyed by the passage of feces as of gas by way of the vagina. Any slight amount of fecal matter finding its way into the closed vagina will be washed back again into the rectum by the constantly flowing urine. In the reported cases, my own included, particular mention is made of the freedom from irritation of the vagina.

THE FISTULOUS OPENINGS.

The truth of the above remarks are more or less dependent on the size of the newly-formed recto-vaginal fistula. Obviously, if the entire septum should be removed, the feces of necessity would pass into the vagina. Hence the opening must be neither too large nor, on the other hand, too small. Dread of the passage of the fecal matter into the vagina led me at the primary operation to make the recto-vaginal opening too small, necessitating subsequent enlargement. I believe it can with safety be made four centimeters in length. Its width should be two centimeters or less and the edges of the rectal and vaginal mucosa should be brought together with sutures to prevent subsequent contraction. The vesico fistula should be made a trifle smaller and if the edges of vesical and vaginal mucosa unite by primary union very little contraction will take place. Even in case of subsequent contraction the apertures can be easily dilated from time to time under an anesthetic, a procedure far preferable to enduring the discomforts of incontinence.

THE RECTUM AS A SUBSTITUTE FOR THE URINARY BLADDER.

Experimental work and clinical cases have shown that the rectum tolerates the presence of the urine and acts as a good substitute for the urinary bladder. The pa-

1. Deutsche med. Woch., 1903, No. 24.

2. THE JOURNAL A. M. A., Feb. 16, 23; March 2, 9, 16 and 23, 1906.

tient has good control of the anal sphincter, the urine being passed, as a rule, only about once in two or three hours in the daytime and only twice at night. No irritation of the rectum seems to result.

CLOSURE OF THE INTROITUS VAGINÆ.

It must be borne in mind that the operation under discussion is for exceptional cases of such a nature as to preclude the hope of relief by plastic surgery. Hence these women are in a pitiable condition and should not be expected to perform their marital duties, much less expose themselves to the risk of pregnancy. At least in two cases closure of the introitus was made during menstrual life, and the women menstruated through the anus without any resulting ill effects. There is no particular difficulty in securing closure of the introitus at the first operation, provided the stitches are so passed as to preclude urinary contamination. The tendency of gas to pass from the rectum to the vagina can be combated to a great degree by a proper regulation of the diet.

DISCUSSION

ON PAPERS OF DRs. GARCEAU AND PETERSON.

DR. C. P. NOBLE, Philadelphia, said that he thought that Dr. Garceau was very moderate in his statements as to the curability of this condition. In his experience it is far more curable than Dr. Garceau stated. He operated on 16 women, and all of them recovered and are now in sound health. Without any exception they made perfect recoveries. With reference to tuberculosis of the bladder, the question of treatment resolves itself as to whether it is primary or secondary to the kidney, and by doing a nephrectomy or nephroureterectomy it will be followed by a spontaneous cure, if secondary. He has been surprised at the facility with which the women got well. The only man operated on by him, who had tuberculosis of the tract with lung involvement, died at a subsequent date. So far as early diagnosis is concerned, he long ago gave up all methods, with the exception of securing the urine and injecting it into guinea-pigs. This, he said, is the only certain way not to confuse the smegma bacillus with the tubercle bacillus. He is convinced of the curability of this trouble. In one case he was misled. He had a patient with tuberculosis of the kidney and bladder whom he sent home to die, but without any treatment she made a good recovery.

DR. J. WESLEY BOVÉE, Washington, D. C., agreed that the results depend largely on whether or not the disease is localized in those organs. The affections of the bladder disappear if the kidney and ureter are removed, but many cases are found in which not sufficient is done; that is, the kidney is removed and the ureter is left, and the disease tends to get worse. It is necessary to do more than one operation in these cases. Surgeons are not justified in saying that the bacillus is not found, because they are found in urine otherwise normal, so that the presence of the tuberculosis alone is not a positive indication as to the presence of tuberculosis in the kidney.

As to the cases reported by Dr. Peterson, one point is the danger of infection following the operation due to the contamination of the vagina and bladder with rectal contents. If the introitus is closed, the opening into the rectum should be near the sphincter. Make the closure higher in the vagina and get away from the sphincter, as irritation of it means more frequent evacuation. It is interesting to know, he said, whether the vaginal secretion has a bactericidal action on micro-organisms in the presence of urine, as it has in the absence of urine. If he were to do an operation diverting urine from the bladder to the rectum, making use of the rectal sphincter as a sphincter, he would form an artificial bladder from the rectum, bringing down the sigmoid and attaching it also, having the sphincter ani muscle act. In these cases it can be done as a preliminary procedure, and then the opening can be made through into the newly made bladder, and there would then be no risk of future contamination.

DR. EMIL RIES, Chicago, said that in the case reported, undoubtedly various other methods could have been considered, and one was mentioned by Dr. Bovée. He thinks in a similar way the Freund operation could be considered; that of turning down the uterus and utilizing it for plastic purposes. Freund's first case was operated in 1894 and the patient had exceedingly good sphincteric action. In Dr. Peterson's case the woman had passed the menopause. Perhaps, he said, the uterus in his case could have been used for sphincteric purposes. In the same way the Maydl operation can be considered. But the only one who can determine what is the best operation for the case is the one who had to do the work and had the case before him.

DR. R. PETERSON, Ann Arbor, Mich., said that the implantation of the trigonum with the ureteral orifices into the sigmoid or rectum (Maydl's operation) is the ideal method of diverting the urinary stream into the bowel. But it certainly is a more dangerous operation than the one he employed, and his patient was not inclined to take any unnecessary risks. He emphasized the point that when the vesical ureteral orifices are preserved intact, there is very little danger of ascending renal infection, no matter what method of anastomosis is employed. The presence of the calculus in his case should not be counted against the operation. Having nothing to go by, he made the openings between bladder, vagina and rectum too small.

CONSERVATIVE SURGERY OF THE OVARIES.*

EDWARD REYNOLDS, M.D.

BOSTON.

In recent literature it has been usual to speak of the conservative surgery of the uterine adnexa as though it were one subject. In point of fact, the resection of diseased tubes and the conservation of the ovaries belonging to them is usually brought to our attention in inflammatory cases and the question then hinges mainly on the condition of the tube, i. e., on the possibility of its restoration to functional value, as balanced against the possibility of reinfection of the pelvis from the patent stump. In this class of cases the condition of the ovary is usually a subordinate matter. These cases are etiologically in a different class from those which present normal tubes and neoplastic ovaries. They are also distinct clinically since in the latter class the decision rests wholly on the state of the ovary. I believe that confusion has been wrought, that clearness of thought has been lost, by treating the two classes as one. Though both are equally important, in this communication I limit myself to the subject of the surgical treatment of neoplastic ovaries with normal tubes.¹

The advisability of the conservative surgical treatment of the ovaries must plainly be determined by observation of the ultimate results of such surgery in practice, and this is usually computed by statistical reports of a series of cases, to which is commonly added the judgment of the individual operator.

I think most of us are satisfied that the application of the strictly statistical method to questions of such comparatively vague nature as the ultimate influence of a conservative operation on the nervous system and general health of a patient is not only capable of producing any result to which the general judgment of the reporter

* Read in the Section on Obstetrics and Diseases of Women of the American Medical Association, at the Fifty-seventh Annual Session, June, 1906.

1. From a clinical standpoint there are of course cases in which cystic ovaries are attached to inflamed tubes or in which the tube attached to neoplastic ovaries is slightly inflamed, but even from a clinical standpoint the cases usually arrange themselves clearly into one or the other class and the existence of transitional cases may clearly be disregarded from the academic point of view.