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DR. EDWIN BEER

Mt. Sinai Hospital

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SOLITARY KIDNEY WITH ARTIFICIAL URETER*

ABRAHAM HYMAN, M.D.

NEW YORK

THE patient, a young woman of twenty-six years of age, was admitted to Mount Sinai Hospital on August 16th, 1924, with the following history:

She has had pain in the left loin radiating downwards for the past five years. These attacks are becoming more frequent of late, lasting about one hour and accompanied by frequency, dysuria, nocturia, nausea and vomiting. She has been married four years and had one miscarriage a few years ago. Two years ago she was operated upon at another hospital and a bicornate uterus was found, the left horn with the tube and ovary being amputated. There was no investigation of the urinary tract made at the time.

Physical examination shows a patient in fairly good condition. Neither kidney is palpable or tender. On vaginal examination an irregular, stony, hard, fixed mass about the size of an orange is felt in the cul-de-sac. It gives one the impression of either a calculus or a malignant growth. A roentgenogram of the urinary tract shows a giant calculus in the left ureter. This calculus is about 4 inches in length and the thickness of the thumb.

Cystoscopy showed an injected bladder with edema of the left meatus. The ureteral catheter was obstructed at the orifice and could not be passed beyond this point. The right ureteral orifice could not be found, after a very intensive search. No blue appeared from either side within fifty minutes after injection. The catheterized urine was cloudy, and showed pus and red blood cells. The phenolsulphonephthalein test was 15 per cent in two hours; the blood chemistry was only slightly elevated. At another cystoscopy a few days later, it was impossible to find a right ureteral orifice, and a diagnosis was then made of ureteral calculus with congenital single kidney.

Operation, August 22, 1924. Left ureterotomy and drainage for ureteral calculus. Though a pararectal incision the left ureter was exposed extraperitoneally. The ureter was found markedly dilated, adherent, and the walls thinned out. An incision was made over the stone and a large calculus extracted in two segments. One fairly large piece remained wedged in the lower end of the ureter, and could not be dislodged.

The condition of the patient did not warrant any further attempts at removal of the remaining fragment, and a drainage tube was inserted into the ureter and brought out through the lower angle of the wound. Following this operation, all the urine drained through the tube in the left kidney, and there was no urine found at any time in the bladder, thus verifying the absence of the right kidney. Indigocarmin was injected and did not appear in the urine until five days after operation.

On September 3, 1924, the patient was again operated, a vaginal ureterotomy being done for the stone impacted in the lower end of the ureter. The stone was readily removed in this way. A few weeks after operation, it was found impossible on a few occasions to catheterize the left ureteral orifice, obstruction being encountered at a few centimeters' distance. After removing the tube from the left ureter, all the urine drained out through the sinus, none being voided by the patient. This condition continued until October 22nd, when it was decided to expose the lower end of the ureter and determine the exact state of affairs.

Operation, October 22, 1924. Suprapubic cystotomy and establishment of ureterovesical anastomosis for ureteral fistula.

A bougie was passed into the ureter through the fistula. An incision was then made, excising the old scar and exposing the ureter. The ureter was found densely imbedded in surrounding tissues which were all baked together, rendering it impossible to mobilize the ureter which was thinned out and friable. The lower

* Read before Section of Genito-Urinary Surgery, New York Academy of Medicine, Dec. 21, 1927.

end of the ureter was traced downwards, where it was found to be entirely occluded. The bladder was then opened and the left ureteral orifice was probed. The bougie could be passed only for a few centimeters. This end of the ureter was also closed off and a gap of about three-fourths inch between both ends of the ureter was present; this portion of the ureter had evidently sloughed away.

Since it was impossible to mobilize the ureter so as to make a new anastomosis with the bladder, the bladder was partially mobilized and brought up to the lower end of the proximal ureter. A hole was then punched in the bladder wall and a drainage tube passed through it into the ureter, after opening up the closed off ends of the ureter. During this procedure the peritoneum was opened in a few places but immediately closed. The bladder was closed with two layers of sutures, and the ureter tube was brought out through the upper angle of the incision. A small suprapubic tube was inserted and kept in place for about three weeks. The tube in the ureter was removed about a week after this.

For a while urine naturally drained through the suprapubic sinus. After its closure the patient voided for the first time per via naturalis. This continued for about four weeks. Less and less urine was then voided, and more and more appeared through the ureterotomy sinus in the abdominal wall. A cystoscopic examination at that time demonstrated that the artificial anastomosis had contracted considerably, just allowing the passage of a No. 5 catheter. The ureter was gradually dilated up to the large Garceau catheter, after which the patient again voided all of her urine. This state of affairs continued for a few months, the anastomosis always showing a tendency to re-contract. It was then found that there were evidences of retention and infection in the left kidney, and in order to remove the strain from this organ it was decided to do a lumbar ureterostomy.

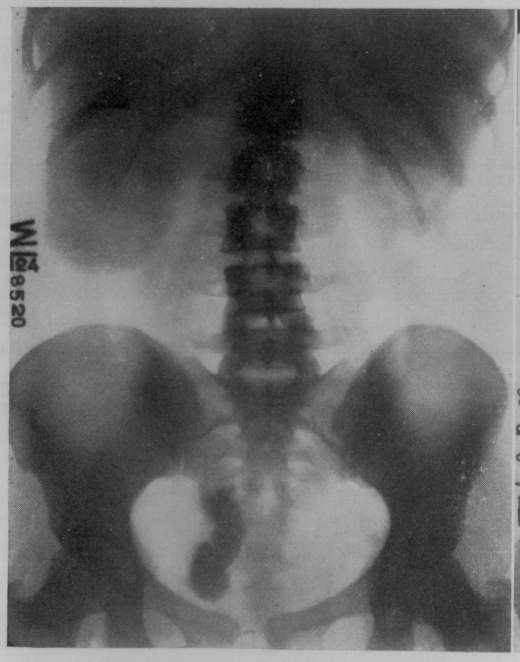

Fig. 1. Ureteral calculus in ureter of solitary kidney.

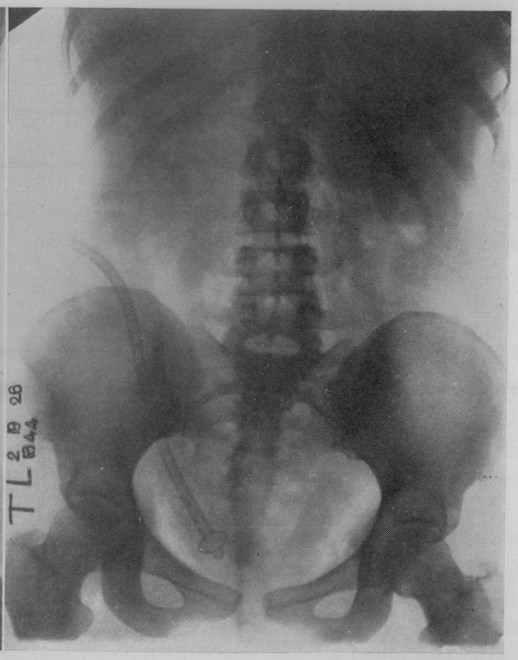

Fig. 2. Artificial ureter employing a Pezzer catheter.

Through a lumbar incision the kidney was exposed and the pelvis and ureter found markedly dilated. An incision was made just below the ureteropelvic junction and a tube placed through the ureter into the pelvis. The problem which confronted us was how to maintain a patulous anastomosis. For this purpose we had special Pyrex glass tubes made, the size being about No. 15 Fr., approximately an inch long. These were passed by means of strings into the anastomotic opening and kept in place for weeks at a time. By clamping the ureterostomy tube, it was found

that the patient voided all of her urine through the urethra. This state of affairs continued for a number of months until the patient had a very severe hemorrhage, evidently due to an erosion of a blood vessel by the glass tube. This form of dilatation was then discontinued. After months of such dilatation by glass tubes, it was found that after discontinuing it the anastomosis again re-contracted. We then decided upon the use of a large Pezzer catheter, which has proved very satisfactory for the past few years. The patient returns to the hospital about once every seven weeks to have a fresh catheter inserted. The technique of changing this catheter is as follows:

A heavy silk thread, about 10 or 12 inches long, is attached to the end of the catheter which projects from the lumbar sinus. A cystoscope is then introduced, and alongside it a heavy dressing forceps which grasps the bulb of the catheter. The catheter is then withdrawn through the urethra. A fresh catheter is then tied onto the lower end of the string, and this is pulled up through the urethra into the bladder so that the bulb lies snugly against the ureteral orifice. The catheter, of course, has a number of perforations to allow of drainage through it from the kidney.

About a year and one-half ago she went through a normal pregnancy without any unusual complications. She retains her urine from two to three hours during the day, and voids once or twice by night. By means of this catheter she is enabled to irrigate the bladder whenever necessary, by opening up the tube which projects from the lumbar sinus and inserting the nozzle of a syringe. We anticipate removing the tube sometime in the near future with the hope that this continuous dilatation for a number of years may have served to establish an anastomosis which will not re-contract.

BILATERAL DOUBLE PELVES AND DOUBLE URETERS*

RIGHT NEPHRECTOMY AND LEFT HEMINEPHRECTOMY

Abraham Hyman, M.D.

NEW YORK

THE patient, a male twenty-eight years of age, was admitted to the hospital in January, 1922. Past history: He had been complaining of pain in the back and frequent urination for two years. Present illness: The above symptoms have been increasing in severity of late, and the patient has noticed that his urine was turbid. Physical examination showed a young man in good condition. Neither kidney was palpable or tender. The roentgenogram of the genitourinary tract was negative. The urine was cloudy, containing large amounts of pus. The phenolsulphenophthalein test was 40 per cent; blood chemistry normal; the Wassermann negative. Cystoscopic examination showed an inflamed bladder. The right ureteral orifice was considerably retracted, and an impassable obstruction encountered at 15 cm. No flow of urine or indigocarmin was obtained from this side. The left ureteral orifice, which was normal in appearance, was catheterized and clear urine obtained, with good indigocarmin within 15 minutes. At the time the first cystoscopy was done, it was not noticed that there were two extra ureteral orifices. A diagnosis of right sided infected hydronephrosis was made, and the patient operated.

At operation it was discovered that there was a double pelvis with two ureters. The kidney was found atrophic and hydronephrotic. In view of the fact that there was practically no kidney tissue left, a nephroureterectomy was done, removing the kidney and ureters in one piece down to within an inch of the bladder. This necessitated an anterior extraperitoneal incision. After operation the patient's urine was perfectly clear for about a week, when it suddenly became turbid. In view of the findings on the right side, a similar condition was suspected on the left.

* Read before Section of Genito-Urinary Surgery, New York Academy of Medicine, Dec. 21, 1927.

The patient did not return again until October, 1927. In the interval he had been fairly well except for attacks of pain in the left lumbar region with moderate frequency of urination. The urine has been increasing in turbidity and the patient finally consented to undergo a second cystoscopic examination. This showed an inflamed bladder. There were two ureteral orifices seen on the right side. These could only be catheterized a short distance. The ureteral orifice on the left side was considerably swollen. Above and to the outer side of the ureter there was an inflamed, edematous area which appeared to be a second ureteral orifice. This orifice, however, could not be catheterized, and no indigocarmin was observed coming down. The normally placed left ureteral orifice was catheterized to the pelvis and clear urine obtained, with strong indigocarmin. The catheterized specimens showed occasional pus cells. At a third cystoscopy the same findings were observed, it being impossible to catheterize the second orifice. A diagnosis was made of double kidney and double ureters, with infection of the lower pelvis and ureter.

Operation, October 14, 1927. A left lumbar incision exposed a double kidney, the upper half represented by normal, solid looking parenchyma. The lower half was hydronephrotic. The kidney was somewhat contracted in the middle at the point of fusion of the upper and lower halves. The ureter coming from the upper half of the kidney was normal in size and appearance; that from the hydronephrotic part of the kidney was considerably dilated. Fortunately, the main blood supply entered the upper half of the kidney. A heminephrectomy was done, with removal of the dilated ureter as far down as could be reached through the lumbar incision. The bleeding was controlled by means of mattress sutures.

The day following operation the patient passed only a few ounces of urine, and for the succeeding twenty-four hours the output was about four ounces. The patient then became stuporous, although he could be aroused. The blood chemistry, which prior to operation showed an urea of 23, now rose to 32, and we were at first under the impression that he was suffering from uremia. The urinary output steadily increased, however, under diureses. This peculiar stupor lasted for about three days and then entirely cleared up, the condition evidently being a postoperative psychosis. Despite the fact that his urinary output increased steadily, his blood chemistry mounted, the urea reaching as high as 73 mgm. a few weeks after operation. A considerable collection of pus was found in the wound. After thorough drainage his general condition gradually improved and the urea dropped down to 49 mgm.

His condition now is very good. The urine is slightly cloudy, the wound is firmly healed. It may be necessary at some future time to remove the lower segment of the ureter, if the pyuria does not clear up completely.

MASSIVE HEMATURIA COMPLICATING PYELONEPHRITIS*

Abraham Hyman, M.D.

NEW YORK

IT is not generally recognized that pyelonephritis may be the cause of a massive hematuria. We have observed two such cases during the past few years which seem worth while reporting.

A male forty-two years of age entered the hospital in April, 1926, with a history of intermittent attacks of pain in the right loin of three years' duration. For the past year the pain has been more constant, radiated downwards, and is accompanied by frequent urination. He has been subject to recurrent attacks of colds, and with each attack there was an exacerbation of the urinary symptoms. For the past seven months he has complained of pain in the left loin, weakness, loss of weight, headaches and nausea, and occasional chilly sensations with slight fever.

Physical examination showed an anemic, thin individual who looked acutely ill. The

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urine was cloudy, acid, with a specific gravity of 1018, and contained considerable amounts of pus. There was fairly marked right costovertebral tenderness. Roentgenogram of the genitourinary tract was negative for calculus, and the blood chemistry was practically normal.

Cystoscopic examination showed an inflamed bladder with numerous cystic lesions resembling cystitis cystica. Both ureters were catheterized, no obstruction being encountered on either side. Indigo carmin appeared from both kidneys within ten minutes, and the catheterized specimens from both sides showed pus, the cultures of which were sterile. Numerous smears examined for tubercle bacilli were negative. A cystogram showed a moderately trabeculated bladder with no evidences of a reflux. Under rest in bed and diureses the patient's condition improved and he was discharged from the hospital after a month.

The patient returned to the hospital in June, 1926, with practically the same symptoms, increasing in severity during the past month. A cystoscopic examination demonstrated the same findings, cloudy urine being obtained from both kidneys. The function of the left kidney was somewhat better than the right. About a week after the cystoscopy he developed a very profuse hematuria which lasted a few days. Cystoscopy showed that the blood came from the right kidney, clear urine being obtained from the left side. During this time he had chills and fever. A pyelogram of the right kidney showed dilation of the pelvis and calices. The phenolsulphenophthalein test was 20 per cent. He then developed very marked left costovertebral tenderness, and a temperature fluctuating between 103 and 105 degrees. Despite an indwelling catheter in his left kidney the temperature did not recede, and a diagnosis was made of a possible left perinephric abscess.

On July 7th the left kidney was exposed, no evidence of a perinephric abscess being found. The kidney was twice its normal size, and on decapsulation revealed multiple small foci of suppuration. The kidney was opened bluntly and the dilated pelvis and calices explored, with negative findings. A tube was then inserted, and the patient drained for a number of weeks. At this time the cultures from both kidneys showed a pyocyaneus infection. Tubercle bacilli were repeatedly sought after but never found. The patient's condition gradually improved and he was discharged a few months after entering the hospital.

He entered the hospital again in October, 1926, with a history of fever, chills, and pain in both kidney regions. This condition lasted for about ten days, and then the temperature dropped to normal.

In February, 1927, he again returned with pain in the left loin. A cystoscopic examination demonstrated a bilateral pyuria with evidences of retention in the right pelvis. Cultures showed pyocyaneus bacilli in both kidneys.

In recapitulation of his treatment during all this time, it may be stated that he had pelvic lavages with mercurochrome and silver nitrate, autogenous vaccines and intrapelvic injections of pyocyaneus vaccines, besides internal antiseptics, including caprikol and methenamine.

Although his general condition has improved somewhat, there has been no change in the local condition, the urine still being turbid and containing large amounts of pus, with a pyocyaneus culture from both kidneys.

The second case, a male fifty-one years of age, was first examined in February, 1927. This patient's history dates back eighteen years when he first contracted bladder and kidney trouble, for which he consulted innumerable physicians. A diagnosis at the time was made of left pyelonephritis. For years he suffered from frequent attacks of pyuria, with severe hematurias, fever and chills and pain in both kidneys. He has had all forms of treatment, including a perineal operation and suprapubic drainage. About ten years ago his left kidney was removed and was found to be a site of a chronic pyelonephritis. Since this operation he has had frequent attacks of pain in the right kidney, fever, chills and massive hematurias lasting from one week to ten days.

Physical examination showed a man in fairly good general condition. He had just recovered from one of these acute attacks of pyelonephritis, and there was still some tenderness present in the right loin. A cystoscopic examination showed a thickened and inflamed mucosa with slight intraurethral and intravesical prostatic adenoma. The residual urine was one-half ounce. The right meatus was swollen. Catheterization of the ureter to the pelvis was made without encountering obstruction. The capacity of this kidney was 8 cc. Urine obtained from the right kidney was

cloudy and contained numerous pus cells in clumps. Indigocarmin appeared in poor concentration four minutes after intravenous injection. The culture from the right kidney and bladder specimens showed a pure growth of colon bacilli. A roentgenogram of the genitourinary tract demonstrated the right kidney to be about twice the normal size. No calculi were seen. We did not consider it advisable to take a pyelogram of this kidney.

Since February the patient has had at least one-half dozen acute attacks of pyelonephritis. During two of these attacks he has had massive hematurias, the last about a month ago at which time the bleeding continued for four days. During these attacks he has fever and chills. He has had bladder and kidney lavages and internal medication with but slight improvement in the local condition. For a period of about two months he was given a colon bacillus Phage lavage of his pelvis twice a week. Some of these lavages were followed by a marked reaction which manifested itself within a few minutes after the injection. For days after such a reaction, the urine was remarkably clear and we looked forward hopefully to a cure of this condition. Since the Phage treatment was discontinued, however, the urine has resumed its same cloudy appearance, and we realize that the effect of the treatments was only transitory.

ECTOPIC SUPERNUMERARY URETER OPENING INTO THE VAGINA*

PARTIAL RESECTION OF KIDNEY AND URETER

ABRAHAM HYMAN, M.D.

NEW YORK

THE patient, a female sixteen years of age, has since early childhood had constant dribbling of urine by day and night. There has never been a period when this has ceased. She voids normally four or five times during the day. Her general health has always been excellent. She has been examined on a number of occasions, and treated for a nervous form of enuresis.

Physical examination shows a well developed, healthy girl. There is considerable excoriation of the labia and the inner aspect of the thighs, the result of constant dribbling of urine. A first inspection of the vaginal outlet was negative. A catheter was then passed into the bladder and some 8 ounces of clear urine withdrawn. A pledget of cotton was then placed in the vaginal orifice; about ten minutes later this pledget was soaked. The bladder was then filled with an indigocarmin solution, and another pledget inserted and removed ten minutes later. It was found soaked with urine, but colorless, thus demonstrating that it was not a vesicovaginal fistula. By means of a strong light and a speculum, a tiny opening was revealed on the anterior vaginal wall, just behind the external meatus. Drops of urine were seen coming from this orifice. Attempts to probe the orifice with fine catheters or bougies were negative, an obstruction being encountered at about 1 cm. distance. A diagnosis was made at this time of ectopic ureter opening into the vagina.

At the next examination the patient was cystoscoped and a normal bladder and ureteral orifices revealed. Both ureters were catheterized to pelvis and clear urine was obtained, with good equal function as determined by indigocarmin. The urine from the third ureter contained no blue after thirty minutes, and was of a pale, watery consistency. The catheterized specimens from the two normally placed ureters contained 1.2 per cent urea; that from the ectopic ureter showed 0.2 per cent urea. A roentgenogram of the urinary tract was negative. A film taken with two opaque catheters in situ showed a normal position of both kidneys. The ureteral orifice in the vagina was then injected with iodid by means of a large syringe with a conical tip.

* Read before Section of Genito-Urinary Surgery, New York Academy of Medicine, Dec. 21, 1927.

After about 30 cc. had been introduced, the patient complained of pain in the left loin. A roentgenogram then taken showed a considerably dilated ureter, ending in a small pelvis in the region of the left kidney. A pyelogram of the left pelvis showed a normal outline, and was in close proximity to the pelvis communicating with the third ureter.

Operation, September, 1927. A left lumbar incision was made, exposing a normal sized kidney with an accessory ureter coming off the upper pole of the kidney. This ureter was markedly dilated all the way down to the pelvis. The normal pelvis was situated in the middle of the kidney and was not dilated. A careful examination of the blood vessels was made and it was found that the vessels entered the kidney in their normal relation, with the exception of a large branch of the renal vein which entered the upper pole of the kidney behind the ureter.

Procedure: It was determined to resect the upper pole of the kidney. The ureter was opened, and a finger introduced into the pelvis to demarcate its outline. The upper pole of the kidney was then resected, after ligating the branch of the renal vein above mentioned. The ureter was freed as far down in the pelvis as could be reached through a lumbar incision, cut across, and the stump carbolized. The upper pole of the kidney was closed with mattress sutures, using fat implants, and the wound closed in layer suture, with rubber dam drain.

The dribbling stopped immediately after operation. The patient made an uneventful convalescence and was discharged from the hospital within three weeks after operation. A control cystoscopy on November 14th (about two months after operation) showed that indigocarmin appeared in equal concentration from both kidneys within a few minutes after intravenous injection, and that there were no evidences of retention of urine in the left kidney.

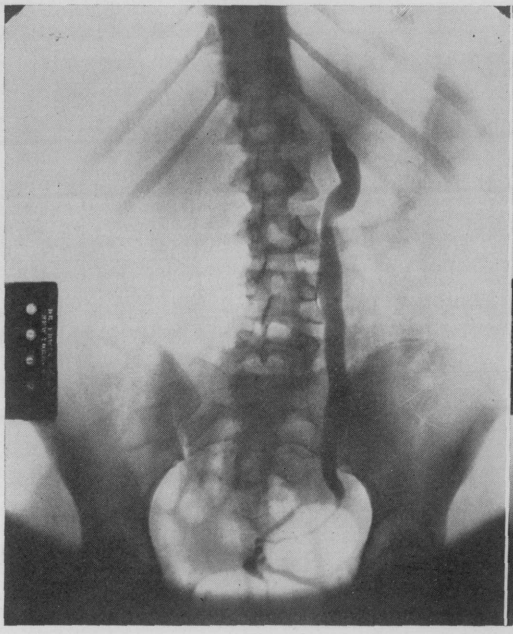

Fig. 1. Pyelogram of supernumerary ureter.

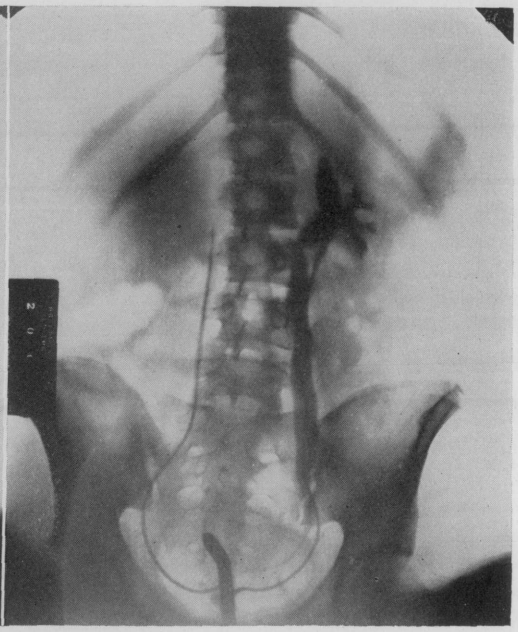

Fig. 2. Pyelogram showing normal pelvis and supernumerary ureter and pelvis.

Up to date there have been reported in the literature 103 cases of this type of anomaly.

Dr. H. Dawson Furniss. It has been my good fortune to have three cases of extravesical ureter. In determining the condition the bladder is filled with indigo carmine or methylene blue solution, and phenolsulphonephthalein injected intravenously. If the leakage is vesical a blue stained fluid is obtained; if the urine discharge is through an extravesical ureter, phenolsulphonephthalein is obtained, provided there is enough functionally active renal tissue connected with the ureter to eliminate the dye. Unfortunately, many are unable to excrete the dye. In some instances a pyelogram on the involved side will show

an absence of the upper calyx. In two of mine the pyelogram was that of a normal kidney. In the case presented by Dr. Hyman there is an absence of the upper calyx in the pyelogram made through the intravesical ureter. In my first case I did an implantation of the ureter into the bladder per vaginum, and seven years later resected the part of the kidney drained by this ureter. The resection is the preferable method unless a large amount of kidney tissue is drained by the ureter and there is no infection. Usually the ureter and the pelvis are dilated and there is infection and pressure atrophy of the renal tissue. It is not only useless but positively harmful to drain such a ureter into the bladder. One of my patients had the condition on both sides. Kilbane's statistics of 101 cases collected from the literature show this occurs in 4 per cent.

With a history of constant urinary leakage since birth, and normal voiding, one should search for an extravesical ureter; it will be present; the difficulty is to find it.

STONE IN HYPOPLASTIC MALPLACED KIDNEY*

Edwin Beer, M.D., F.A.C.S.

NEW YORK

THE patient, male, forty years of age, for the last year has had right sided colics which have gradually become more frequent. There has been no hematuria and no temperature. The roengtenogram of the genitourinary tract showed a shadow just above the posterior superior spine, on the right side. The shadow is semilunar in shape and lies transversally along its axis. The patient's voided urine was perfectly clear.

On admission to Mount Sinai Hospital, roentgenological studies of the genitourinary tract showed the right kidney to be low, part of it being in the false pelvis. There was a stone apparently in this kidney near the crest of the ilium. On pyelography, the kidney was found partly in the pelvis, its upper pole extending a little above the crest of the ilium. The calices were dilated and blunt, and two of them pointed towards the spine, whereas the lowest calyx pointed in the opposite direction. Pyelograms of the opposite kidney showed slight abnormalities but the kidney was placed normally and the pelvis was apparently bifid.

Cystoscopic examination of the separated urines showed that the function of the right side was diminished, and microscopic examination showed some pus cells.

On May 27, 1927, with a diagnosis of stone in a non-rotated kidney, the right kidney was exposed through a very low incision starting in the lumbar region and coming down into the right iliac fossa, and since the kidney was converted into a hydronephrotic sac it was removed. The organ was found deformed and hypoplastic, and about one-half the size of a normal kidney. The pelvis presented anteriorly, and the kidney itself was held close to the midline and in the false pelvis by at least three groups of veins and arteries which entered the kidney on its mesial and anterior surfaces. In addition, one large vein ran across the lateral convexity over the upper pole, and a small vein entered posteriorly. All of these vessels had to be tied separately, and then the ureter was ligated and the specimen removed. The kidney was about 2¾ by 1¼ inches, having a fair residual of healthy parenchyma surrounding the dilated pelvis and over the calices.

The ureter entered the anterior surface near the lower pole and divided into three branches, two wide lateral branches and a superior branch which became a calyx of the upper pole. In the upper pole this extra calyx was divided into two small lateral branches. This created practically a condition without any definite intrarenal pelvis, all the branches being evident external to the kidney parenchyma except the terminal short piece. The stone was found stuck firmly within the first lateral branch of the pelvis near the lower pole in the external part of the kidney.

After a mild wound infection, the patient made an uneventful recovery.

ROENTGENOGRAPHIC EVIDENCE OF PERINEPHRITIC ABSCESS*

Edwin Beer, M.D., F.A.C.S.

NEW YORK

ALTHOUGH the majority of perinephritic abscesses are easily recognized, there is a large group of cases in which perinephritic abscess is present and in which the diagnosis is very difficult. Whether all of these abscesses originate in the kidney parenchyma or not, the urinary findings are usually of so little value that they do not help in the diagnosis. For many years, just as W. F. Braasch has done, I have tried to make use of urine cultures

* Read before Section of Genito-Urinary Surgery, New York Academy of Medicine, Dec. 21, 1927.

to determine the presence of such an infection in and about the kidney, but although a certain percentage of the cultures have given us staphylococcus aureus, it was too small a percentage to be of real clinical import.

In those obscure cases which run along under the care of the family physician with a diagnosis of typhoid fever, influenza, pulmonary tuberculosis, endocarditis, etc., it would be of great value if additional physical evidence of the presence of a perinephritic involvement could be obtained by some of our laboratory methods. In going over a series of roentgenograms, it has seemed to me that there are certain roentgenological findings which may help to confirm the diagnosis when suspicion of a perinephritic inflammation has been aroused and when the local signs are not absolutely diagnostic. In children this aid would be particularly valuable.

In studying the flat plates or films of patients suffering from perinephritic abscess, I have observed two signs which, when associated, may prove of diagnostic value. As far as my literature search is concerned, as yet no description of these two roentgenological features of perinephritic abscess has been encountered, though one of them, the obscuration of the lateral edge of the psoas muscle, I recall discussing several years ago at the East Side Medical Society, and Ockerblad has also mentioned this in his discussion. A recent study of a number of flat plates of these cases has shown *first, that the spine is curved away from the involved side,* perhaps due to contraction of the spinal muscles near the suppurating focus. This arching of the spine towards the opposite side, as can readily be seen in the demonstrated films of a large number of cases, is interesting and significant. As the inflammatory condition disappears, the spine becomes straight again.

The *second roentgenographic evidence of perinephric abscess, obscuration of the outer margin of the psoas muscle,* is apparently less regularly present, although in many cases it also is very definite. The mass produced by the abscess and perinephric swelling obscure the outer margin of the psoas muscle, and as a result there is a striking contrast between the edges of the two psoas muscles, on one side the edge being clear-cut and on the other no edge (or a very faint one) being visible. Naturally, any large kidney growth or large lower pole kidney or retroperitoneal tumor, as well as a psoas abscess, may do the same thing. Although such kidney tumors, or hydronephroses, etc., may overlie the psoas edge and obscure it, still unless there is an infection or a blockade with infection of such a kidney, apparently one fails to get a reflex contraction of the muscles which leads to the arching of the spine away from the involved side. In view of the fact that these latter cases are likely to give urinary findings of a pathological character on the side involved, this also will exclude the presence of a perinephric abscess which, as I said in the opening remarks, is usually associated with no marked change in the urinary secretion.

DISCUSSION

Dr. Clyde W. Collings: I might add a word to what Doctor Beer said. An interne at Bellevue Hospital, Doctor Bates, drew Doctor Keyes' attention to the obliteration of the psoas muscle in perinephritic abscess about five years ago. We feel this roentgenographic finding greatly aids us in diagnosing a perinephritic abscess.

UREMIA DUE TO URETERAL OBSTRUCTION: NEPHROSTOMY*

Paul W. Aschner, M.D., F.A.C.S.

NEW YORK

THE patient is now in the hospital after a second operation. He is a man of forty years, admitted to the medical service for loss of weight, headaches, nausea and vomiting. The only other symptom was a slight hematuria a few days before admission to the hospital. His systolic blood pressure was found to be 138 to 140; the urine was grossly clear, with a

* Read before Section of Genito-Urinary Surgery, New York Academy of Medicine, Dec. 21, 1927.

specific gravity of 1.004. The specific gravity was fairly fixed, never above 1.010. The blood urea nitrogen was 120 mgm. The medical diagnosis was chronic nephritis or possibly polycystic kidneys.

Roentgenographic examination showed a small kidney outlined on the left side within which was a faint triangular shadow interpreted as a stone. On the opposite side was seen a kidney about twice the size of the one on the left.

I therefore suggested that the patient had a stone in the left kidney producing an atrophic condition of that organ, rendering it incapable of being sufficient for the excretory functions of the organism, and that he had probably been living for some time on the opposite kidney which was now obstructed.

Cystoscopy showed urine coming from the left kidney, pale watery urine such as he was passing from the bladder. On the right side was an obstruction at 15 cm. which was passed after some effort, and 90 cc. of purulent urine were aspirated. The catheter was left in place for drainage.

He was suburemic, and that was a factor in his having no pain. With ureteral drainage the blood urea gradually came down to 70 mg. Then he developed fever and chills and the right kidney region became very tender. I thought it time to do more than drain the kidney by catheter because he now had cortical infection and was doing badly. After a preliminary phlebotomy and transfusion, I exposed the kidney and found the cortex studded with small abscesses. A nephrostomy was done and the kidney decapsulated. He was desperately sick for three or four days. The blood urea came down gradually to 28 mgms. Three or four weeks after the nephrostomy, he passed, without any pain, a stone 1 × 0.5 cm. composed of uric acid, which therefore had cast no shadow in the roentgenogram. Thus without colic, the kidney wide open and draining freely, the stone passed down the ureter and into the bladder. It seems that this is evidence of the ability of the ureter to expel calculi without the factors of renal distension and back pressure.

The nephrostomy tube was removed and the kidney closed promptly. The patient went home feeling very well with blood urea 30 mg. The urine, however, showed considerable pus.

A few weeks ago he began to feel poorly, lost appetite, weight and strength, and was constantly nauseated. The urine became very purulent. He had stiffness of the extremities and muscular cramps. The blood urea had again mounted to 45.0 mgm.

Cystoscopic examination showed no obstruction and clear urine on the right (operated) side. Thick pus was seen coming from the left ureter which presented an impassable obstruction to the catheter at 20 cm. Pyonephrosis of the left kidney was therefore diagnosed. Two days ago this kidney was exposed and found to be a pus sac. The ureter was obstructed by granulation tissue and stricture at the ureteropelvic junction where the tip of the calculus impinged. The kidney was therefore removed and the patient is making a smooth postoperative recovery.

VESICOURETERAL REFLUX IN CYSTOGRAPHY*

Paul W. Aschner, M.D., F.A.C.S.

NEW YORK

I HAVE reviewed the cystographic studies made on Dr. Beer's service at the Mount Sinai Hospital since 1920 with especial reference to the incidence of vesicoureteral and vesicorenal reflux. It has been the practice on that service not to employ cystography as a routine procedure but to use it only in those instances in which we felt it would add to the accuracy of our cystoscopic diagnosis, and in cases in which cystoscopy could not be undertaken. The number of cases thus studied was 202 of which 173 showed no evidence of reflux. Reflux was demonstrated in 29 cases, about 14 per cent of all cases examined.

The technique consisted of injecting 5 ounces of 6 per cent sodium iodide for one

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exposure, then 3 ounces more for the second exposure. Anteroposterior and lateral-oblique positions were employed. Finally the iodide was permitted to run out and 5 ounces of air were injected.

Certain observations of interest were made. The phenomenon of reflux is not constant. In several cases it was present at one examination and not subsequently, or vice versa.

In relation to the cystoscopic appearance of the ureters reflux occurred in two types of cases: (a) cases in which the ureteral orifices were wide open, patulous and rigid; (b) cases in which the ureters could not be catheterized for more than a centimeter. The orifice was normal in size but there were evidences of disease of the bladder wall about the orifice such as polypoid edema, interstitial cystitis, tuberculosis, etc.

We have also had some instances of pyleographic examination of one kidney in which the medium descended into the bladder and ascended through the opposite ureter, demonstrating the possibility of error in diagnosing bilateral renal tuberculosis.

Reflux was not observed in any of the 39 normal cases examined. The negative cases comprised a great variety of pathological conditions, such as neoplasm, diverticulum, prostatic obstruction, contracture of vesical neck, cystitis of various types, etc.

The positive cases were as follows:

Cystitis (tuberculous or non specific)	6
Prostatic obstruction	3
Diverticulum	4
Neoplasm	5
Contracture of vesical neck and urethral obstructions:	
Adults	5
Children	6

PAPILLARY CARCINOMA OF BLADDER

RESECTION; TWO CASES CURED FIVE AND SEVEN YEARS*

Paul W. Aschner, M.D., F.A.C.S.

NEW YORK

THE first patient was a man treated in 1917 in the out-patient department for a papillary tumor of the bladder by fulguration. He then disappeared but returned in 1920 with a recurrence of hematuria. On cystoscopic examination he presented a large flat sessile type of papillary growth on the right wall of the bladder and on the floor behind the trigone but not involving the ureteral orifice. A biopsy specimen was reported papillary carcinoma. Using Dr. Beer's technique, a cautery resection was done, having first catheterized the ureters so that they could be easily identified in the operative field. Although I resected fairly close to the right ureteral orifice, I felt that it was not necessary to resect the ureter itself.

In the course of convalescence, the patient developed a small soft stone in the bladder, and on attempting to remove it cystoscopically under gas anesthesia, there occurred a perforation of the bladder wall where the resection had been done a month before. He was watched for a few hours, and then, it being decided that he had a penetration of the bladder, he was reoperated. The stone was removed and the small penetration of the posterior wall sewed up. The pouch of Douglas and the bladder were drained. The patient recovered.

After discharge from the hospital I did not hear from him again until I looked him up recently. He was cystoscoped and the bladder found free of tumor.

The other patient had a somewhat different course. He was first treated about 1918 in the out-patient department for papillary tumor of the bladder by fulguration, and later came in with a recurrence and was again treated with fulguration. He had three or four large tumors in the bladder, and in the course of treatment of one of these tumors he developed

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some very acute symptoms which we don't usually see: marked tenesmus, burning and pain, etc. On rectal examination, he presented on the side where one of the tumors had been fulgurated a soft, boggy, tender swelling, which was somewhat puzzling to interpret. Because of these acute symptoms, he was operated and I found an extraperitoneal perforation of the bladder wall caused by the high frequency current. . . . An extra vesical exudate had formed at the base of the tumor which had been destroyed. The other tumors were destroyed by cautery. He healed up and was well until 1922. He had a recurrence presenting three tumors, one way up at the fundus. Two yielded to cystoscopic fulguration. The fundal tumor was not influenced thereby. A biopsy showed it to be a papillary carcinoma.

A resection of the fundus was therefore done which was rather difficult on account of the previous operation. He healed up well and came back about two years ago with a very small papillary growth at the fundus again; this was benign and disappeared with fulguration. He has to void often and has some contracture of the vesical neck. He was cystoscoped recently and his bladder was found to be inflamed but with no evidence of growth anywhere.

POINTS IN THE TECHNIQUE OF KIDNEY STONE OPERATIONS*

EDWIN BEER, M.D., F.A.C.S.

NEW YORK

IN kidney stone operations the two most important desiderata are, first, to remove all the stone material, and second, to destroy the kidney parenchyma as little as possible.

In 271 stone operations between 1921 and 1925, I find that in 18 per cent of the cases a nephrectomy was necessary because of the destruction of kidney tissue. In 5 per cent of the cases, owing to the extensive disease of the opposite kidney, or to the fact that the stone was in a solitary kidney, the stones had to be removed without dislocating the organ. In the rest of the series, the operation of choice was a pyelotomy, with or without a small nephrotomy or a wide nephrotomy. In the last 38 personal cases, the same percentage of nephrectomies obtains, but 29 pyelolithotomies were done, and only one wide nephrolithotomy. This very definite swing towards regular pyelolithotomies, with or without small nephrotomies, spares kidney parenchyma, and owing to the cooperation of the roentgenologist, complete removal of all stone material is obtained.

To remove stones by a wide pyelotomy incision which may extend into the adjacent parenchyma, the kidney must be carefully exposed and, if possible, well delivered. Through such a pyelotomy incision with care even the most complicated stones can be delivered. And if the shape of the stone is such that its base or widest portion is near the cortex, such pieces should be removed through a small caliceal incision through the cortex. Before stones are removed the ureter should be carefully constricted with ligatures so that no fragments can fall down into the ureter. After the surgeon feels that he has removed all the stones that can be easily recognized, the kidney is photographed and the film immediately developed. This will show at once whether any fragments have been left behind, which occurs in a good number of cases despite the greatest care and despite the fact that the kidney had been thoroughly irrigated before the pictures were taken.

If the kidney cannot be delivered, it may be necessary to do a nephrotomy to get at the stones. Under these circumstances, we regularly throw a rubber tourniquet around the pedicle, so that the operation is done under complete ischemia. Even these kidneys lend themselves to roentgenography, and in such cases, although it is more difficult to get a complete picture of the undelivered kidney, the information obtained is of value.

In past years we regularly dreaded fragmentation of stone during delivery, but nowadays, with roentgenographic control of the exposed kidney and the immediate development of the films, no such fear of leaving fragments behind oppresses the surgeon. In about 30 cases where the stones were of a complicated shape, the kidneys have been roentgenographed in the operating room, and in about one-half of these fragments were found still present and usually easily located and removed.

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EFFECT OF NEPHROTOMY ON RENAL FUNCTION

INCISION AND SUTURE*

EDWIN BEER, M.D., F.A.C.S.

NEW YORK

ONE of the difficulties in kidney surgery is to decide whether the second kidney is really perfectly adequate. It is well known that a normal secretion can take place from a hypoplastic kidney, and if one removes the other kidney, such a hypoplastic kidney may be inadequate. Geraghty thought that these hypoplastic organs could be recognized preoperatively. Fortunately, in my experience I have never encountered a situation where I had to rely upon such an undeveloped organ following nephrectomy on the other side.

The value, however, of our various tests can be experimentally studied on a kidney that has been nephrotomized and sutured. About a year ago such a nephrotomy was done by me from pole to pole, and closed with a double layer mattress suture as well as hemostatic sutures on the cut surface to control bleeding. This patient has been repeatedly examined since then to determine whether that particular kidney was deprived of any great degree of functional ability by the operation and suture, and much to my surprise the urea percentage concentration, the indigo carmin concentration, and the phenolsulphonephthalein output have been very slightly changed from that of the normal opposite side.

Years ago I noticed that concentrated indigo carmin could be discharged through a lumbar sinus from a small residue of healthy parenchyma which had been accidentally left behind. In the case recently studied, to which I am referring, very similar qualitative as well as quantitative output has been noted. For instance, preoperatively the operated right kidney gave an 0.8 per cent urea as compared to 1.1 per cent on the left side. There was good equal indigo carmin from both sides. About four weeks after a wide hemisection of the right kidney, the indigo carmin on both sides was identical, fairly strong, and the urea on the right was 0.6 per cent, and on the left 0.7 per cent. About a month later, a differential phenolsulphonephthalein test was made on both sides, and the right compared to the left as 45 to 65, a strong concentration being present in both sides. Seven months later a further control showed strong indigo carmin from both sides, with urea on the right side markedly less than on the left, but recontrol three months later showed that the phthalein output was strong in six minutes on both sides. The relation of the right to the left was as four is to seven, and the urea on both sides was 1.2 per cent.

This and similar previous experiences throw considerable doubt upon our ability to determine preoperatively whether we are dealing with a hypoplastic kidney or not.

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CARCINOMA OF THE BLADDER SECONDARY TO ARTIFICIAL CYSTITIS

CALCULUS PYELONEPHROSIS; NEPHRECTOMY AND TOTAL CYSTECTOMY

EDWIN BEER, M.D., F.A.C.S.

NEW YORK

M. W., male, forty-four years of age. In 1911 the patient was first seen by me, and was suffering from a chronic cystitis with contracted bladder. At this time he gave a history that to escape military service his cystitis had been induced. After some treatment at Mount Sinai Hospital in 1911 the symptoms cleared up and the patient improved.

In 1917 he began having symptoms in his right kidney region, pain radiating to the bladder, frequency of urination, and hematuria. Since three months these symptoms had become worse, and he had lost 25 pounds. A roentgenogram taken showed the right kidney occupied by a large stone, and the patient was sent to Mount Sinai Hospital in June, 1927. At Mount Sinai he was cystoscoped and carcinoma of the bladder and a right pyonephrosis were found. In view of the purulent discharge from this kidney, it was deemed advisable to remove the kidney first, and subsequently take care of the bladder neoplasm.

In August, 1927, the kidney was removed by Dr. Hyman. After recuperating from this operation, the patient returned to Mount Sinai Hospital, and a cystoscopic examination on October 18th, 1927, showed the bladder full of foul bloody urine with numerous clots. The capacity was 8 ounces, and there was an extensive growth on the posterior and right and left lateral walls. The cystogram showed an almost normal shaped bladder, except for the fact that the inferior left circumference showed the bladder walls to be slightly raised. By rectum it was possible to detect a hard, infiltrated mass occupying the whole bladder region. In view of the extensive growth which reached apparently well down to the neck of the bladder, the patient was told that he would probably require a total cystectomy, to which he consented.

On October 21st, 1927, the bladder was exposed extraperitoneally and found to be extensively involved, the walls infiltrated well down over the prostate, and as it was seen through the open bladder that it was impossible to remove the growth except by a total cystectomy and prostatectomy, the bladder cavity was gently packed with gauze and an extraperitoneal excision of the bladder done, with the upper two-thirds of the prostate and the seminal vesicle, as well as the lower end of the right ureter (from the point that Dr. Hyman had cut across it at the nephrectomy). The left ureter was then brought out through a gridiron incision in the left iliac fossa. The wound was soaked in alcohol, and the ureter was intubated with a catheter.

After several days through the median suprapubic incision a large number of radium seeds were introduced into the stump of the prostate with the object of destroying any tumor cells that might have been left behind. The patient made an uneventful recovery.

ENLARGEMENT OF THE BREASTS AFTER PROSTATECTOMY*

Lewis T. Mann, M.D.

NEW YORK

DURING January, 1927, J. T., seventy years old, Russian born, had a two stage prostatectomy. At that time no enlargement of the breasts was noted on physical examination. On November 2, 1927, he returned complaining of his breasts enlarging, the right more than the left. He noticed this three weeks ago because his suspenders were causing irritation by bearing pressure on the breasts, giving more of a sense of uneasiness than actual pain. He stated that the increase in size was gradual and that lately he had to discard his suspenders for a belt for comfort's sake.

On examination, the patient is seen to be an old man of rather slight build, showing the usual physical characteristics of senility, atrophied skin, pigmentation, white hair and beard, etc. The external genitalia are apparently normal. The Wassermann reaction is negative.

The right breast is uniformally enlarged, protruding about 6 cm. from the chest wall with a normal male nipple from which no fluid can be expressed. On lifting the breast there can be felt an increase in the amount of glandular tissue but no cyst formation. The enlargement is equal in all quadrants, of firm consistency and no isolated distinct masses can be made out. There is no redness or heat and only a moderate amount of tenderness. On rolling the breast under the hand, it is felt to be moderately firm, not fixed nor indurated and no mass is palpable. Some small, firm, freely movable glands can be felt in the axilla. The left breast presents the same picture but is smaller.

Kondoleon[1] reports two cases occurring in men, both seventy years old. The first developed a swelling of the right breast the size of a walnut one month after prostatectomy and after one year it had entirely disappeared. In the second case, the enlargement was noticed in the right breast three months, and in the left four months after prostatectomy. The swelling receded on the right side in this case.

Oppenheimer[2] reports two cases of breast enlargement in men. The first was in a man of sixty-four following prostatectomy. He was of the muscular male type and noticed enlargement of his breasts three months after operation. The right protruded 9.2 cm. and the left 8 cm. from the chest wall, and on picking up the breast an increase of breast tissue could be made out but not by rolling under the hand. He fails to describe the breasts in further detail but states that the external genitalia were normal.

The second case was a man of forty-eight, also of the muscular male type who had his breasts enlarge some months after sphincterotomy for contracture of the neck of the bladder.

In attempting to explain the etiology of this condition, which he terms "gynaecomastia following prostatectomy," he states that gynaecomastia comes on after a change of the male hormone, especially after castration or atrophy of the testes. He cites Monaschkin[3] who saw this occurring with tumor where greater part of the normal testicular tissue was destroyed. All these men were of a feminine physical type, whereas both of Oppenheimer's were of marked muscular male status.

He points out that so-called prostatectomy is not an extirpation of the gland but generally an enucleation of the tumor mass, the prostatic tissue being left behind with a capsule according to Tandler and Zuckerkandl,[4] Marion[5] and others. The prostate is therefore not destroyed but rather given a chance to recover its function after the tumor is removed. On the other hand the manipulation during enucleation and packing may injure the prostatic tissue outside of the tumor mass. In his cases the adenoma was easily shelled out in the first instance and in the second only muscular tissue was removed.

He states that sexual function after prostatectomy is not necessarily disturbed, quoting Joseph[6] who says that such men after operation have normal sexual function for their age and that coitus is possible and that they have spermatozoa in their urine. Therefore the

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normal sex hormone is evidently still present, but what role the prostate or its internal secretion, if it has one, plays, is hard to say.

As to proof that the prostate has an internal secretion, and if so how it would cause the breasts to grow or whether or not the lack of such an endocrine in the male would do this, no proof is forthcoming.

There have been investigations to determine whether or not the prostate has an internal secretion. Senalach and Pares[7] found that after total extirpation of the prostate in animals that contraction of the ejaculatory ducts and secretion of the preputial glands ceased. Posner and Kohn and Biedl[7] found intravenous injections of watery and glycerine extracts of the prostate to be very toxic. Haberern says that after extirpation in animals function of the other genitalia ceased. Waldeyer[8] believes that if we ascribe an internal secretion to the prostate that the seminal vesicles also must have one. Bachrach[9] agrees with this. Oppenheimer[2] is of the opinion that the prostate has an internal secretion.

Granting then, that the prostate may have an internal secretion, it is impossible to say what influence the presence or the lack of it has on the growth of the breast, especially in an old man after prostatectomy.

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