With the Compliments of the Author.

PAPERS UPON

GENITO-URINARY SURGERY.

BY A. T. CABOT, A.M., M.D.,
Surgeon at the Mass. General Hospital.

presented by the author

BOSTON:
DAVID CLAPP & SON.
1896.

PAPERS UPON

GENITO-URINARY SURGERY.

BY A. T. CABOT, A.M., M.D.,
Surgeon at the Mass. General Hospital.

BOSTON:
DAVID CLAPP & SON.
1896.

FIVE CASES OF RUPTURE OF THE URETHRA TREATED BY EXTERNAL URETHROTOMY AND SUTURE.

THE intractable nature of traumatic stricture of the urethra is so well known that no apology is required for a report of some cases in which an attempt was made, by immediate suture of the ruptured urethra, to furnish accurate coaptation of the divided ends of the canal and by promoting rapid and smooth healing of the mucous membrane, to avoid the formation of a stricture.

French surgrons have interested themselves much in this class of injuries. According to Salvait,[1] their practice up to 1858 was to treat these cases by simple perineal incision. From that time till 1875 it became more and more the practice to search for the posterior part of the urethra by an early perineal section with the object of introducing and fastening in a catheter (*sonde à demeure*).

Some difference of opinion still existed, however, among the best men during the decade commencing in 1880 as to whether it was well to introduce the catheter at once or whether it was better to simply establish perineal drainage by the early operation, and some days later, after the swelling had gone down, to search for the posterior urethra and place the *sonde à demeure* in position.

The attempt to temporize led to the frequent resort to aspiration of the bladder for the purpose of relieving its tension until the urethra was able to resume its functions or until the formation of a perineal abscess or a urinary infiltration compelled a resort to more radical measures.

During this decade the tendency towards an immediate suture of of the urethra began to show itself, and the very thorough and con-

[1] Thèse, Paris, 1882, 1883.

vincing experimental work of Dr. Kaufmann, of Zurich, showing that an immediate suture greatly lessened the extent of the cicatrix in the urethral wall, gave an impetus to a further trial of this method, even in the face of considerable opposition from some good authorities. Since that time a number of cases have been reported in which the immediate suture of the canal has been followed by the best results in the way of quick and safe healing.

The effect of urine leakage in favoring the formation of indurated, contracting fibrous tissue, and the part it consequently plays in stricture of the urethra, has been pointed out by Mr. Reginald Harrison and constantly urged by Dr. J. P. Bryson of St. Louis. A ruptured urethra offers the best possible conditions for the formation of tough fibrous tissue under the constant irritation of the urine.

No one who has cut down upon a ruptured urethra and found the partially or completely separated ends of the canal lying in a ragged cavity filled with a blood-clot; and then, after the application of stitches, has seen the integrity of the urethra restored so that a catheter passes smoothly by the point of union into the bladder without a hitch, can doubt that by the operation the amount of cicatricial tissue will be greatly lessened and the chance of a troublesome stricture by so much reduced.

If the urine can be kept from coming in contact with this closely joined wound for a few days, it will give time for such adhesion as to practically seal the tissues against subsequent urine leakage. When this can be successfully accomplished, it seems rational to hope that the cicatrix will be a thin and supple one and will not lead to troublesome stricture formation.

Hitherto, the formation of a stricture has been regarded as the inevitable consequence of a urethral rupture; and while in the fortunate cases of moderate severity, the regular passage of a sound may keep the urethra permeable, a neglect of this precaution may be expected to result in a rapid closure of the stricture. In other cases of greater severity the stricture shows a constant tendency to contract in spite of every effort to keep it open, and repeated operations are required to avert the serious consequences of a complete closure.

In the cases of sutured urethra that I have found reported up to this time, the patients have been kept under observation for too short

a time to enable us to get any idea as to the final result in the matter of stricture formation.

That I might contribute as far as possible towards supplying information on this point, I have followed my cases by every possible clue, and have succeeded in finding and examining three of them at periods from four and a half to two and a half years after the operation. I shall be greatly obliged for information as to either of the others that may have come under the observation of other practitioners.

Case 1. J. C., aged eighteen, fell astride of a barrel twenty-six hours before entrance to the hospital, August 28, 1891. Urination was impossible, and an attempt to pass a catheter had failed.

Under ether a perineal section was immediately done. The bulbous portion of the urethra was so crushed as to be divided across two-thirds of its extent, so that only a narrow strip of the roof of the canal remained intact. This rent in the urethra was closed by four catgut stitches so taken as to include the muscular and cavernous tissue surrounding the urethra but not encroaching upon the mucous membrane. When these were tied the canal was so restored that a catheter slipped in with perfect ease. It was fastened in place and the outer part of the wound was left open so that in case of any leakage the urine should not be shut up within the tissues. Recovery was uneventful. The catheter was removed upon the tenth day and the patient left the hospital well at the end of twenty days.

For two years this patient had intermittent treatment with sounds and bougies, in accordance with advice given him at the hospital. A No. 27 French bougie was the largest size passed in this time. He was seen and examined on March 10, 1896, when he told me that he had not had an instrument passed for three years. The urine was clear and passed in a good stream. Sounds Nos. 26 and 28, French, passed without resistance and caused no bleeding.

Case 2. P., aged twenty-three, entered the Massachusetts General Hospital, October 17, 1891. Twenty-four hours before entrance he had fallen astride a pail which caused a sharp hemorrhage from the urethra. He was unable to pass water, and his physician could not enter a catheter.

Operation was done immediately. While being etherized there was a sharp hemorrhage from the urethra, which was restrained by

pressure in the perineum. The perineum was occupied by a large clot of blood. Upon cutting into this and turning it out, the two ends of the urethra, completely separated, were found in the cavity. The ends of the canal were joined by six catgut stitches, and upon tying these the hemorrhage, which had been persistent and troublesome, was entirely stopped. A catheter was slipped in easily and was left in place.

The patient proved unruly, and on several occasions removed the catheter. Presently a small abscess formed in the perineum which required opening. After this all went well; and he was discharged November 11th, thirty-one days after operation.

Case 3. J. J. G., aged thirty-one, entered the hospital, July 2, 1892. He had fallen astride a joist forty-three hours before entrance. This was followed by hemorrhage from the urethra and the formation of a large hematoma in the perineum, and the patient was unable to pass water nor could a catheter be introduced.

At the time of entrance the bladder reached to the umbilicus. The distention of the bladder was relieved by aspiration, and as soon as arrangements could be made operation was done. Upon cutting into the perineum by the median line, a blood-clot about the size of an orange was found and turned out. In this case there was complete separation of the urethra and there was some difficulty in finding the proximal end, but when it was found the two portions of the urethra were easily united by catgut stitches and a catheter put in place. The patient made a good recovery, and went home twenty-three days after the operation.

Case 4. J. D. P., aged twenty-one, entered the hospital June 29, 1893. In jumping off a bicycle he had struck the perineum on the rear wheel with so much force as to break the wheel. This caused ecchymosis in the perineum, hemorrhage from the urethra and inability to pass water. A large silver catheter was passed by his attendant under ether, and the bladder washed with boracic acid.

The following day swelling and pain in the perineum had increased, and he had a chill. He was operated upon by an incision in the median line, and the clotted blood lying about the urethra was turned out. The rupture was found extending transversely across the bulb, completely separating the two parts. The ends of the urethra were united

by catgut stitches; and these at once stopped the hemorrhage, which had been troublesome. The patient for a few days was pretty sick, with a tendency to a suppression of urine; but after this was over, he rapidly recovered. The catheter was out on the eleventh day, and he went home with the wound wholly healed on the nineteenth day.

In answer to a letter, this patient reported in February, 1893. He had never had any trouble in urination and the water was perfectly clear. On examination by sounds the large sizes were arrested at the seat of the rupture. After a No. 22 French sound had been passed through the stricture, it easily yielded up to a No. 25, French. One week later a No. 26, French, was readily passed without any exercise of force, and later still larger sizes were used.

Case 5. C. F. M., aged twenty-two, entered the hospital October 21, 1893. He had fallen astride a chair five days previous to entrance, since which time he had been constantly troubled with hemorrhage from the urethra, especially at the time of urination, with a tendency to swelling in the perineum.

A perineal section was done. Clots lying about the urethra were turned out, and it was found that the lower part of the urethra was torn across, the roof of the canal being the only part intact. The ends were joined by catgut stitches, and a catheter was introduced and left in place. The catheter was removed on the tenth day, and the wound was entirely closed on the twentieth day.

The patient returned for a time to the out-patient department for the passage of sounds. One month after his discharge from the hospital an instrument of No. 30 French calibre passed easily. This patient was seen again February 11, 1896. At this time a No. 30 French sound passed with ease through the whole canal, although he had had nothing passed since 1893.

In all of these cases the immediate result was good. In three of them the opportunity was given for an examination some years after any dilating instruments had been used. In *Cases 1* and *5* no stricture was found, and instruments as large or larger than any used after the operation slipped past the point of rupture with perfect ease.

In *Case 4*, while no interference with urination was noticed, a narrowing of the urethra was found. This narrow point was, however, not a hard cicatricial stricture, but was so soft and yielding that without the least exercise of force it was rapidly dilated to a good size.

These results would certainly encourage a continuation of attempts to promote immediate union of the urethra when divided by violence.

The operation is not a difficult one. A median incision opens the blood cavity about the urethra. After the clots have been turned out, a sound passed down the urethra quickly shows us the anterior end. If the urethra is not fully divided across, the rent is then easily seen and readily repaired. When the division has been complete, the posterior end may not be so easily found, but in a fresh rupture the profuse bleeding which occurs from the bulb of the urethra, instead of obscuring our search, serves as a guide to that which we are seeking. If then, the bleeding point in the posterior part of the wound is seized with forceps and pulled forward, the collapsed and retracted end of the urethra will be brought to view. In a case of longer standing, when the bleeding has stopped the search may be more difficult, in which event firm pressure should be made above the pubes to force the escape of urine to serve as a guide.

In all of these cases the suture was made with interrupted catgut stitches, which were all placed before any of them were tied. Care was taken to include only the cavernous and muscular tissue in the stitches and not to encroach on the mucous membrane. In every case, upon tying the stitches, the hemorrhage immediately stopped.

CONCLUSIONS.

(1) In cases of ruptured urethra, immediate perineal section with suture of the urethra should be practised.

(2) By this procedure not only do we greatly lessen the danger of urinary infiltration and abscess, but we also, in a large proportion of cases, may hope to prevent the formation of close intractable strictures.

(3) In an early operation the search for the posterior end of the urethra is much easier than it is later. The hemorrhage from the branches of the artery of the bulb serves as a guide to that end of the canal.

A CASE OF CYST OF THE KIDNEY APPARENTLY CURED BY A SINGLE ASPIRATION.[1]

On November 22, 1869, Mrs. A. A. L. was seen and the following history was obtained: Nine years ago, after a long cramped ride, she had an attack of pain in her bowels. This pain was spasmodic in character, and was accompanied by a lump in the right side of her abdomen. According to her present recollection, this lump was located about on the level of the umbilicus. In the next four years she had many such attacks, which were ascribed by some physicians to "fæcal deposit," and purgation was usually followed by relief. Seven years ago Dr. Rich, of Worcester, told her she had a floating kidney.

For the past five years she has been free from these attacks, until the 28th of last August, when she was again seized with a pain in the abdomen similar to that previously experienced. This was again accompanied by a lump in the right side and there was some vomiting. This time the lump did not disappear, as it had after the previous attacks, but steadily increased in size till it reached its present proportions, about eight weeks ago.

Since then it has remained practically stationary, though she thinks it varies somewhat in size and hardness from time to time. There is no pain about it, though occasionally there is some sensitiveness to pressure at different points on its surface.

Her bowels are regular, and there is no noticeable irregularity about her catamenia. There has been no disturbance of micturition, and nothing abnormal has been noticed about the urine.

Examination showed a tense, elastic tumor extending from just below the ribs on the right side down to the level of the anterior

[1] Read before the fourth annual meeting of the American Association of Genito-Urinary Surgeons, Altoona, Pa., June 3, 1890.

superior spine of the ilium. It reached a little across the middle line at the level of the umbilicus, and round into the lumbar region, where it could be easily felt when pressed back from in front. It was smoothly ovoid in outline and slightly movable. When the patient was on her back it moved up and down with respiration. It could not be reached through the vagina, and the pelvic organs seemed to be healthy in every way.

The amount of urine passed in the twenty-four hours was about a quart, and the specific gravity was low—from 1·006 to 1·008. It did not contain albumin, nor did the microscope discover any casts or abnormal cells.

For a week an accurate measure of the daily amount of urine was made, and at the same time the patient kept a close watch on the tumor, to see if there were any variations in size. No definite result was obtained, and afterward, when under constant observation for five days, no change in the tumor could be detected.

The locality and character of the tumor led to a strong suspicion that it was a hydronephrotic kidney, and this feeling was strengthened by the history of previous attacks, accompanied by the presence of a tumor in the same region.

On December 14, 1889, the tumor was aspirated through the lumbar region. Three pints of dark-brownish fluid were drawn off, completely emptying the sac and causing a disappearance of the tumor. The abdomen was then compressed by a swathe with a pad of cotton batting over the former site of the tumor.

The fluid removed was examined by Professor E. S. Wood, who reported as follows: Color, brown. Specific gravity, 1·011. Reaction, very slightly acid. Albumin, 0·27 per cent.

There was much sediment, consisting chiefly of blood, normal and abnormal, and of small round cells, like renal cells, most of which were slightly fatty; also numerous brown granular cells of the same size as compound granule cells, but not fatty; two cylindrical bodies, somewhat resembling casts, one of which was brown granular and the other contained small round, fatty cells.

A quantitative analysis showed that 100 cubic centimetres contained 0·034 gramme of urea, 0·590 gramme of NaCl, and 0·270 gramme of albumin.

The small amount of urea in this fluid, and the character of the cells found in it, consisting of old and fresh blood and of compound granule cells, makes it seem probable that this was a cyst of the kidney rather than a hydronephrosis.

The cyst showed no sign of refilling, and Mrs. L. slowly gained strength. On March 20th (three months after the aspiration) Mrs. L. was seen and thoroughly examined. No tumor could be discovered in the right side, though there was, perhaps, a little more resistance than on the other side. She was still not strong, though steadily gaining. There had been a very decided improvement in the character of her urine. On March 24th the amount in the twenty-four hours was forty-one ounces, and the specific gravity was 1·016. The reaction was acid and no abnormally formed elements were to be found in the sediment.

There had been no reaccumulation of fluid in the cyst in three months, and in this time there had been so decided a gain in the quantity and character of the urine that it seemed probable that there had been a re-establishment of function in the remaining parts of the affected kidney.

This case is reported as an unusually favorable instance of what a simple aspiration may accomplish in these cases.

A CASE OF CANCER OF THE URETHRA.[1]

THE rarity of a primary urethral carcinoma is my reason for putting the following case on record.

C. W. T., an elderly man, entered the Massachusetts General Hospital, March 29, 1895, and gave the following history:

Thirty-five years ago he had gonorrhea, from which he entirely recovered. Nine years ago an abscess formed in the perineum through which, however, no urine passed. At that time the urine passed in a good stream, and he never noticed any trouble in urination until one year ago when he began to have some difficulty in passing water. He did not, however, have complete retention, and his condition improved somewhat under medical treatment. Nine weeks before entrance, a swelling appeared in the perineum which was painful, and confined him to bed. At the end of a fortnight it was lanced, and pus was evacuated from it. A week later the urine began to come through the opening. For a time after this he improved in his comfort; but then the swelling began to spread, and less and less urine passed through the natural passage, until all of it came through the fistulæ. Examination showed the perineum to be occupied by an indurated mass extending forward beneath the scrotum, with two fistulous openings over it. The urethra was impervious to instruments, even of the smallest size, all of which were arrested at about the peno-scrotal angle.

On April 1st, the perineum was widely laid open, considerable pus being evacuated from various side pockets. The walls of the abscess were of such a sloughy character that nothing unusual was noticed at that time in the character of the case. A drainage-tube was carried through the cavity of the abscess and was brought out in front of the

[1] Read before the American Association of Genito-Urinary Surgeons, at Niagara Falls, May 30, 1895. Microscopical sections of the growth were shown to the Association.

scrotum. The greater part of the induration cleared up in a few days, but there still remained a hard sloughing mass at the bottom of the cavity about the urethra.

Ether was again administered on April 15, 1895, and a careful examination showed this hard tissue to be distinctly of the character of a neoplasm. It extended forward to the peno-scrotal angle and backward to just anterior to the triangular ligament. The prostate was slightly enlarged, but not more than is usual in a man of his age.

A piece of the new growth was cut out for examination. Dr. W. F. Whitney, who kindly examined it, reported as follows: "The bulk of the fragment is composed of large solid masses of rather small, slightly cylindrical epithelial cells, separated by a relatively narrow stroma of vascularized connective tissue. The central parts of the epithelial masses, which have a more or less branching character, have undergone necrosis." The tumor was thus shown to be a cancer, of which the cells were small and cylindrical in character.

Its origin from the urethral mucous membrane, or from some of the glands associated with it, was made clear by the anatomical relations found at the operation. The tumor was separated by a wide interval from the skin and did not extend in either direction beyond the perineal portion of the urethra.

As regards treatment, the case came under observation too late to admit of any possibility of eradicating the tumor by operation and the escape of urine was perfectly free and painless after the perineum had been freely laid open. The only further treatment was directed to keeping the urine in a bland and unirritating state by the use of benzoate of soda and to diminish the discomforts of the sloughing mass in the perineum by the use of antiseptic applications.

Dr. F. Tilden Brown, in the preparation of his article upon urethral diseases, in "A System of Genito-Urinary Diseases," etc., was able to find but five recorded cases of urethral carcinoma:[1] those of Schustler, Thiersch, Guyon, Trzebicky and Guiard. In four of these, exact post-mortem and microscopic examinations were made, and in all four cases the urethral cancer was found situated in the perineal portion of the canal. In Schustler's and in Guiard's cases the perineal swelling

[1] At the time that this paper was read Dr. R. W. Taylor cited a recently reported case of Oberländer's in the International Centralblatt.

simulated an abscess and led to incision. These two cases were very like the one just reported.

In these cases, also, the carcinoma had undergone colloid degeneration and softening. In the case that I have reported, a marked feature was the tendency to necrosis of the cells in the centre of the masses of epithelium. This was easily explained by the scanty supply of nourishment supplied by the sparse connective-tissue network.

Brown says: "The origin of urethral cancer is from the urethral mucous membrane, and Thiersch has drawn attention to the possibility of its originating in the region of a stricture. Poncet and Paget record cases in which the carcinoma seems to have originated from the margin of an old fistula."

Although in my case there had once been an abscess, this had not resulted in a fistula and there had been no evidence of a stricture, although one of large calibre may have existed. The cylindrical character of the epithelial cells suggests the possibility of the disease having started in one of the mucous glands (of Littré); but the fact that the epithelium that covers the urethral mucous membrane in the bulbous portion of the canal is rather cylindrical in shape, leaves us unable to argue anything from the character of the cells.

While undoubtedly a cancer of the deep urethra is a great rarity, I can remember one case of cancer of the penis in which the disease seemed to have started in the region of the fossa navicularis. In this connection, too, it may be interesting to put on record a case in which a cancer of the prostate extended forward into the urethra.

D. A. P., an old gentleman of seventy, had been troubled for ten years with some difficulty of urination. In September, 1894, this difficulty became much aggravated, and the straining to pass water became extreme. In November he began to suffer pain through the penis and rectum, and considerable burning as the water passed.

I first saw him February 4, 1895. He was then a thin, frail-looking man. The bladder at this time formed a distinct elastic ball above the pubes. The prostate was found to be very large and nodular. A diagnosis of probable malignant disease of the prostate was made, and the use of a catheter advised. He returned to the care of his regular physician, Dr. Frank Blaisdell, of Goffstown, N. H., and was for a time somewhat more comfortable.

I saw him again in consultation with Dr. Blaisdell, May 16, 1895. He was using the catheter twice in the twenty-four hours, and getting five or six hours of ease after its use. The examination now showed the prostate to be still larger and more nodular than at the previous examination. The point of especial interest was that, at this second examination, I found a nodular hard mass, from three-fourths of an inch to an inch in diameter, extending forward along the urethra through the perineum and to the perineo-scrotal junction.

This is the only case in which I have observed the extension of malignant disease forward from the prostate along the urethra. The tendency in other cases that I have seen was to extension backward into the bladder.

A CASE OF SCIRRHOUS CANCER OF THE BLADDER IN WHICH VILLI WERE NOT FOUND IN THE URINE, AND A CASE OF CYSTITIS WITH ULCERATION, IN WHICH VILLI WERE FOUND IN THE URINE, ALTHOUGH NO TUMOR EXISTED.[1]

THE first patient was a man of fifty-five. The duration of his illness from the appearance of the first symptoms to death was about two and a half years.

The history was briefly as follows:

Two years and a half ago, after a long ride on horseback, he had quite a sharp hæmaturia, of short duration. Soon after this he began to notice frequency of micturition, which was presently associated with pain. His pain was of two kinds; One, a dull, persistent pain, felt just above the pubes and sometimes to the left, sometimes to the right of the median line. The other pain was sharper in character, was felt along the uretha and through the penis, and was aggravated by micturition.

After the first hæmorrhage there were several similar attacks of bleeding occurring at considerable intervals, and the severity of the pain and the frequency of the micturition, though somewhat intermittent, increased pretty steadily in spite of all measures for their relief.

In March, 1888, Dr. John Homans, who saw the patient in consultation with his medical attendant, touched a stone and gave ether, intending to remove it by litholapaxy; but he was unable to grasp anything with the lithotrite, and the washing brought away only a little calcareous matter.

This operation was followed for a few days by some relief of the pain.

[1] Read at the annual meeting of the American Association of Genito-urinary Surgeons, May 22, 1889.

Examination of the urine at this time showed nothing beyond a little mucus in the sediment, with many oxalate-of-lime crystals.

In July, 1888, I saw the patient for the first time. The symptoms had continued about the same since March, although he had during the interval steadily lost flesh and strength.

Careful examination of the urine detected nothing beyond a moderate amount of pus in the sediment.

With the sound a stone could be felt which seemed to lie or be held in the upper part of the bladder, and was most easily found when the viscus was empty.

Abdominal palpation revealed nothing in the bladder or kidney, and by the rectum only a moderate symmetrical enlargement of the prostate was felt.

It was decided to again etherize the patient, and, if the stone still eluded the lithotrite, to do lithotomy.

Ether was given early in August, 1888, and with the lithotrite the stone was again felt in the top of the bladder, but could not be grasped.

The sensation imparted through the instrument was as if a calculus lay in a sac in the vesical wall, where it could not be reached with the blade of the lithotrite.

Owing to its position, it was thought that it could probably be dealt with by suprapubic cystotomy, and the high incision was made after filling the bladder and distending the rectum with a rubber bag after the Garson-Petersen method.

Upon coming down upon the bladder, a hard mass about an inch and a half in tranverse diameter was felt behind the pubes. It was at first thought that this was the encapsulated stone, but the knife thrust into it did not encounter a stone, nor did it open the bladder.

This thrust did open the peritonæum, although it was made close upon the upper edge of the pubes.

By separating the tissues laterally and further investigating the condition, it was found that the central tumor extended down behind the pubes as far as could be felt, and was surrounded by several smaller nodules, which, when punctured with a needle, gave no calcareous resistance. Further, it was found that the tissues about were adherent to and puckered into the tumor, which was evidently a malignant new growth.

The contracting character of this tumor, shown by the puckering of the tissues about it, made the diagnosis of scirrhous cancer probable, and its extension deeply behind the pubes toward the prostate made it evident that the growth could not be removed with any reasonable hope of present safety to the patient. In view of this and of the practical certainty of its return, it was decided to desist from further interference. The peritoneal rent was closed with a fine, continuous silk suture, and the outer wound was brought together with interrupted sutures.

The patient made a good recovery from this operation. In the washings which were obtained from the bladder at this time, one bit was found which Dr. W. W. Gannett thought to be a piece of a new growth.

From this time the disease steadily progressed, with a good deal of pain and a gradually increasing frequency of micturition, which seemed to be due largely to a progressive diminution in the size of the bladder.

The patient finally died, April 17, 1889, with evidence of disease of the kidneys, which came on rapidly toward the end of life.

At the autopsy, pyelonephritis was found, together with the local condition which is shown in the specimen.

The bladder is reduced to a small size, and is attached to the pubes by a new growth which involves the whole anterior bladder wall and projects into the vesical cavity as an irregular papillomatous nodule, one portion of which is covered by a thick calcareous incrustation.

The tumor outside of the bladder forms one nodule about two inches in diameter, which has grown into the lower end of the rectus and pyramidalis muscle and encroaches somewhat upon the upper edge of the pubes.

Microscopical examinations by Dr. W. F. Whitney has shown this to be a carcinoma with much contracting intercellular tissue. The anterior commissure of the prostate shows a similar carcinomatous change.

The specimen does not enable one to say whether the tumor had its origin in the bladder wall or whether it started in the prostate.

Klebs and some other observers think that cancer of the male bladder always starts in the prostate, and, although many exceptions to this rule have been reported, it is doubtless true that a large proportion

of the cancers situated near the neck of the bladder are prostatic in their origin.

In this case clinical observation never showed any marked change in the prostate beyond a slight, even enlargement. The character of the growth was unusual among bladder tumors, and the difficulty of diagnosis, owing to the absence of villi in the urine, was of interest.

In connection with this observation the writer would like to briefly report another case of difficult diagnosis in which villi were present in the urine, although no tumor existed in the bladder:

The patient was an old man with an enlarged prostate and quite a severe cystitis. He was seen in consultation with Dr. Reed, of Dorchester, and was suffering much from the obstruction to micturition caused by the prostatic enlargement. A catheter was tied into the bladder to relieve the constant tenesmus which made rest impossible, and a specimen of the urine was examined by Dr. W. W. Gannett. It was a foul urine, containing blood and pus, with what appeared to be well-marked villi from a papillomatous growth.

The age of the patient made it seem probable that a cancerous growth existed in the bladder, and drainage through a perineal opening was advised. The family could not at first make up their minds to this, and when they finally sent for me the patient was moribund and no operation was deemed advisable. He died a few hours later.

A partial autopsy was made, and the following is Dr. Gannett's report on the condition of the bladder and prostate:

"The cavity of the bladder was enlarged and the wall was about three times the usual thickness. The trabeculæ were fairly prominent. The mucous membrane in general was of a slatey color and quite opaque. Here and there in the trigonum were small areas covered with a fibrinous false membrane, which was firmly adherent.

"Each lateral lobe of the prostate was enlarged to the size of a big horse-chestnut, and the so-called middle lobe formed a pear-shaped body about the diameter and rather longer than a big olive. It measured from the colliculus seminalis to the posterior tip seven centimetres.

"There was a loss of mucous membrane upon portions of its upper surface, and also a few diphtheritic patches.

"The whole specimen was hardened, and vertical sections were made through various parts. In the middle lobe of the prostate the

erosian had bared the gland structure and there was a proliferation of the glands in the form of long acini, lined by a single layer of epitheleum. These, projecting into the ulcerated surface and separated from each other by a thin layer of fibrous tissue, gave the appearance of villi, and it was probably these that were found in the urine.

"No evidence of cancer was found in the prostate."

We had here a severe cystitis with erosion of the bladder surface of the prostate laying bare the proliferating gland acini, and, some of these becoming separated and being found in the urine, presented the appearance of villi from a papillomatous growth.

I do not remember to have seen this source of error in such cases mentioned, and it therefore seems to me important to put this report upon record.

A CASE OF SACCULATED BLADDER, WITH AUTOPSY.

THE following case of sacculated bladder presented certain points of practical interest. I will first report the clinical part of the case, and then will describe the pathological condition.

William H. consulted me first in November, 1889. He was then fifty-seven years of age, and had suffered with symptoms of stone for three or four years. As far as could be determined, this stone originated in the bladder, as he had never suffered from renal colic. In the middle of November I removed, by litholapaxy, a stone weighing 116 grains, and composed of uric acid and urates. He made a good recovery from this operation. The bladder was washed out with a litholapaxy pump on two subsequent occasions, the first time a small quantity of sand and gravel coming away, and the last time the washing being perfectly clear. He was not seen again until March, 1891.

At that time he again applied to me, and reported that, though very much more comfortable after the last operation, he was not entirely relieved of his symptoms, some frequency of passing water and slight pain, referred to the penis, continuing. He had used a catheter during this time every night, drawing each time from two to three ounces of residual urine. He had occasionally passed a little gravel. I sounded him without detecting a stone, and advised an ether examination.

This was made on the 18th of March, 1891. The bladder felt roughened to the sound, but no stone could be touched. For further exploration, I made a perineal incision, and the finger, introduced into the bladder, touched a little rough surface of stone rather high up on the posterior wall, where it could be barely reached with the aid of the hand above the pubes, pressing the bladder downward. It was made out that this bit of stone was a projecting portion of a calculus which

was enclosed in a pocket, and it being impossible to dislodge it from this pocket by any manipulation of the finger, a suprapubic incision was made over the point of a sound, introduced through the perineal wound. Through this opening above, the stone could readily be reached. It was found to be about the size of an English walnut, and to be contained in a pocket, the neck of which was not larger than a small pencil, and attached to this was a little, roughened bit of bone, projecting into the bladder cavity. The neck of the sac was gradually enlarged so as to admit a pair of forceps, and after many attempts to withdraw the stone, it was finally broken by the forceps and removed piecemeal. It was difficult to remove the last fragments, but with a scoop and irrigation this was apparently accomplished. The bladder cavity now seemed to be free.

He had a slight chill the following day, with a temperature up to 102°. From this time on he did pretty well until the 6th of April; but at that time the urine still contained an abundance of pus, and it being necessary to readjust the tubes, an examination was made under ether, and the bladder was searched without anything being found. The opening into the sac had, at this time, contracted so that it could with difficulty be found. The temperature again arose to 102° after the operation, but two days later came back to the normal point. The urine, which had hitherto been abundant, began soon after this to diminish in quantity. It contained a little albumen, but no more than the pus would account for. No casts were ever detected.

From this time on, in spite of all efforts to assist and supplement the action of the kidneys, he gradually failed, with a progressively diminishing amount of urine; and about six weeks after the last examination he died.

At the autopsy nothing of especial importance was found, except in the urinary organs. The bladder was much thickened and inflamed, the mucous membrane being highly congested and eroded in places. The wall of the bladder was not much trabeculated. The ureters on both sides were somewhat dilated, and were slit up with the scissors directly through to the bladder. These incisions passed directly through two pockets arranged symmetrically, one associated with each ureter, lying a little above and outside of it. One of these pockets was the one from which the stone had been previously removed. It still con-

tained a little fragment of stone. On the other side the pocket was very much more narrow, opening into the bladder by a very small opening, and this contained in the upper part a little calculus about the size of a kidney bean. This smaller pocket lay rather closer to the ureter with which it was associated, than did the pocket on the other side. A careful search of the posterior walls of the bladder revealed the existence of a number more pockets similar to the last one found, — that is, having very small communications with the bladder. A careful search among these failed to show any other containing a stone.

The right ureter, which was that one associated with the smaller pocket, which lay closer to it than was the case on the other side, was considerably distended with thick, purulent material, and the pelvis of the kidney on that side was slightly dilated and filled with the same sort of grumous material. The right kidney was somewhat shrunken, in a state of interstitial nephritis, with which was associated a pyelo-nephritis. On the other side the ureter was more nearly normal, though somewhat dilated. That kidney, the left, was in a state of moderate pyelo-nephritis.

The condition, then, which led to the fatal result, was an interstitial nephritis, with a pyelo-nephritis superadded to it. The pyelitis was no doubt secondary, and was unquestionably aggravated by the obstruction to the ureters due to the pressure upon them of the sacculated stones.

The symmetrical disposition of the sacculi, and the thickness of their walls led me to think that there might be some congenital cause for them. I therefore had the walls of these pockets carefully examined under the microscope, and found that the muscular coat of the bladder ran a considerable way up on the pockets and ceased towards the apex, — the outermost part of the pockets being simply composed of the mucous membrane surrounded by fibrous tissue.

In regard to vesical diverticula, Orth says they are situated preferably on the sides and base of the bladder, and also on the posterior wall. They are either congenital or acquired. In the congenital cases,—also in the acquired cases which are brought about by the pressure of stones,—we find all the coats of the bladder in their walls, even the muscular layer. On the contrary, in the greater number of the acquired diverticula, the condition is a hernia of the mucous membrane

between enlarged bands of muscular tissue. Only when they are small can a part of the muscular coat still be shown in their wall.

These herniæ of the mucosa are often very numerous in hypertrophied bladders, and may be symmetrically arranged in accordance with the arrangement of the muscular bundles. They are at first quite small and flat, but become more rounded and larger, until they reach the size of a walnut, an egg, or a child's head. The opening between the muscular fibres, at first angular, becomes more rounded with the increase of size, but may be very small, even when the diverticulum is large.

In my case the way in which the muscular coat ran part of the way up on the walls of the diverticula, seemed to show that in part, at least, they depended upon a congenital condition for their production. The openings in all of them were round and very small, instead of irregular, as you would expect if the mucous membrane had simply pushed out between the muscular bundles. The muscular tissue surrounding their necks was more abundant and ran much further up on their walls, than would be the case if it simply represented the muscular bundles which had been pushed aside as the mucous membrane forced out between them. So that I am inclined to regard this as a case of congenitally diverticulated bladder, in which perhaps the mechanical effects of the pressure of urine had some influence in enlarging the pouches. The fact that there were stones in but two of them, and that in one case the stone was very small, shows that they were not pockets formed by the pressure of stones.

This case illustrated very well the importance of making a digital exploration of the bladder in cases of uncertain diagnosis, where persistent symptoms continue, and also showed how much more easily such conditions can be reached and treated by supra-pubic incision than through the perineum.

I think there can be but little doubt that it is better practice to crush a stone *in situ*, when it is so thoroughly encapsulated as in this case, rather than to try to free it by incision. For a considerable incision in the neck of the sac would have exposed the patient to the danger of urine infiltration and perivesical abscess.

Finally, the possibility of the *symmetrical* arrangement of pockets should be borne in mind when operating on these cases, and a knowledge of this point may lead to the discovery of pouches that would otherwise be overlooked.