THE Journal of the American Medical Association.

EDITED FOR THE ASSOCIATION BY N. S. DAVIS.

PUBLISHED WEEKLY.

Vol. VII.

CHICAGO, SEPTEMBER 4, 1886.

No. 10.

ORIGINAL ARTICLES.

DIGITAL EXPLORATION OF THE BLADDER, WITH REPORT OF TEN CASES, INCLUDING TWO PROSTATOTOMIES.¹

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The exploration of the bladder in the female by the finger, introduced through the dilated urethra is a recognized surgical procedure of long standing. By an incision from the perineum into the membranous urethra, a condition analogous anatomically to the natural structure of the female is artificially produced in the male; for the exploring finger can then be introduced at a point corresponding to the location of the urinary meatus of the female; that portion of the urethra which is solely a genital organ and peculiarly masculine—the penile portion—being thus avoided, the bladder of the male is thereby rendered quite as accessible as is that of the female. This method of exploring the bladder in the male by means of perineal urethrotomy—brought prominently before the profession as a systematic means of diagnosis some three years ago by Sir Henry Thompson and Mr. Whitehead—often affords the only means for the recognition and relief of obscure vesical disease. By it the surgeon is also enabled to differentiate between disorders of the kidney and of the bladder when all other diagnostic means, even the microscope, have failed; and he can often readily relieve a painful condition that has long been blindly and unsuccessfully treated under the comfortable and comprehensive designation of “cystitis.” This term cystitis, by the way, should be relegated—with jaundice and dropsy—from the list of diseases to the catalogue of symptoms; since it is apparently always secondary to some tangible abnormality in the urinary or pelvic organs or in the spinal cord. Yet simple, safe, and valuable as the operation is, it can be made unnecessarily, and even with disastrous results. Like many other surgical proceedings, it is safe only when the surgeon possesses not merely the requisite manual dexterity but also an intelligent comprehension of the conditions involved. It is the object of this paper to offer some suggestions, based on experience and observation, as to the indications for *not* performing, as well as for performing, this operation.

¹ Read in the Section on Surgery, at the Thirty-Seventh Annual Meeting of the American Medical Association.

During the past eighteen months it has been my lot to make a digital exploration of the bladder, by perineal urethrotomy, in nineteen adult males. In seven cases the exploration was incidental to the performance of membranous urethrotomy for stricture and afforded no particular information; in the remaining twelve cases the operation was made as a means either of diagnosis or of treatment, or of both, as shown in the following brief résumé:

Case 1.—George G., 58 years old, came under my care April 29, 1885. Has had gradually increasing difficulty in urination for four years. Two years ago he had complete retention; was relieved by catheter. On that occasion the urine drawn was he says “like glue.” Some bleeding followed the withdrawal of the catheter. Since that time urination has been frequent, painful and straining; he often makes several unsuccessful efforts before the urine appears; is frequently compelled to use a catheter; urinates about every hour day and night. Defecation occasions severe pain in the perineum and penis. Has been treated for cystitis and for prostatic enlargement without appreciable improvement. On examination the prostate was found symmetrically and moderately enlarged; catheter shows 6 to 8 ounces of residual urine; the eye of the catheter is filled with clotted blood; a drachm or two of blood follows the withdrawal of the instrument. The urine becomes semi-gelatinous on standing a few minutes. With the microscope there are found some pus and many blood corpuscles. A diagnosis of villous growth from the prostate is made with entire confidence.

Operation May 1: The finger detected just to the left of the urethral orifice, springing from the prostate, a villous growth with a circular base about half an inch in diameter; and imbedded in its meshes two calculi as large as a pea and a bean respectively. Tumor and stones were removed and the site of the growth thoroughly scraped with the curette. Rather free hæmorrhage was controlled by hot water and pressure. Convalescence was uninterrupted; the perineal wound was completely healed on the 17th day. Patient resumed work. Urination was free and painless; he rose usually once during the night to evacuate the bladder. June 22 he observed for the first time a little blood at the end of urination; this was repeated several times up to the end of July, at which time I lost sight of him.

The interesting feature of this case was the diagnosis; the villous nature of the growth was predicted upon the tendency to hæmorrhage, the rapid clotting

of the blood, but especially upon the gelatinous appearance of the urine after standing a short time; that it grew from the prostate was considered almost certain in view of the pain along the urethra and in the perineum.

Case 2.—C. G., 17 years old, was referred to me in October, 1884. For two years, he had had gradually increasing frequency and pain in urinating; for one year the urine had contained considerable pus and albumen. On examination I found no objective symptoms in the urinary or genital organs; subjectively there was pain and tenderness of the urethra and bladder neck; urination every half-hour day and night.

Diagnosis not certain, but *tuberculosis of the kidney pelvis* is suspected, though no bacilli were found in the pus examined at that time.

At my advice, he went in November as a forlorn hope, to Southern California. For three weeks after arrival he improved rapidly in both and general symptoms; then after exposure in the rain, a decided aggravation of the disorder ensued. The local physician assured the patient and his mother that there was no tuberculosis about the case and that complete and permanent relief would be obtained by opening the bladder. In April he returned to Chicago and I was requested to perform the operation, but declined on the ground that it would be useless; for I was now enabled to confirm the diagnosis of tuberculosis by the discovery of the characteristic bacilli in the pus expelled with the urine. Finally, however, when it became apparent that the patient and his friends were determined to have the operation performed by some one, I consented. May 18 I explored the bladder with absolutely negative results. A slight improvement in the local symptoms lasted for some weeks.

Examination November 21 showed nodular enlargement of the right epididymis, typical of tubercular disease. The patient's local symptoms were about the same as before, his general health somewhat worse. In this case, the important feature was the diagnosis, which was necessarily somewhat doubtful until the bacilli were discovered in the urinary pus; and even then the possibility that an additional undiscovered factor might be present—a vesical calculus or growth—was a reason for operation. The case illustrates the established but often neglected fact, that extreme irritability of the bladder and tenderness of the urethra can be caused by disease of the kidney-pelvis.¹ An unpleasant result was a persistent, though very slight perineal fistula, caused by my failure to remove the drainage tube until nearly three weeks after operation.

Case 3.—Michael H., 63 years old. Gives a history of cystitis for four or five years. Complete retention two years ago. Admitted to County Hospital, April 14, 1885, for retention; relieved by catheter. Was sounded for stone with negative result; the case was regarded as one of enlarged prostate, and the bladder

was irrigated daily. May 1 was transferred to my service; found him very weak, emaciated and feverish, temperature ranging from 101 to 104, pulse from 110 to 140; has had irregular chills for two weeks past. On examination per rectum I could detect no prostatic enlargement, but felt a sac about as thick as a lead-pencil containing numerous small calculi, and extending from the left apex of the prostate upward along the rectum as far as the finger could reach. My diagnosis was concretions in the seminal vesicle and consequent cystitis. As the patient's condition was critical I determined upon immediate operation.

May 1, with the assistance of Drs. Miller and Fenger, I explored the bladder. Upon inserting the finger into the bladder I found that the concretions were more plainly felt there than by the finger in the rectum. Hence we concluded that they must be contained not in the seminal vesicle, but in a diverticulum of the bladder. Yet it was impossible to secure a direct contact with the stones, as they were everywhere covered with mucous membrane. A little search revealed at the lower extremity of the mass, a slight depression in the surface of the bladder. The mucous membrane at this point was torn by the finger-nail, which thereupon came into contact with a calculus. The opening was enlarged and calculi ranging in size from a pea to a hazel-nut were scooped out of the cavity, one after another, until seventeen lay upon the table. The patient rallied nicely from the operation; his pulse and temperature became nearly normal, and for two weeks I entertained, in spite of his previous condition, a hope that he might recover. At the end of the third week, however, he began to exhibit an evening rise of temperature, and he finally died June 12, six weeks after the operation.

Case 4.—John A., 38 years old. Was admitted to the County Hospital October 16, 1885. For over a year he has been compelled to urinate frequently and has had pain above the pubes and along the urethra. These symptoms gradually increased and were repeatedly complicated with retention of urine; during the last six months he has constantly carried, and frequently been compelled to use, a catheter. On admission he is attempting to urinate, with but little success, every fifteen minutes day and night; and complains of constant and severe pain, aggravated during urination, along the urethra, in the glans and behind the symphysis. The urethra is so tender that he yells with pain upon any attempt to introduce a rigid instrument. With a soft catheter it is ascertained that there is no decided stricture and that the entrance to the bladder is unobstructed. There is no prostatic enlargement; the urine contains a little pus.

Diagnosis: A tumor, nature unknown, though probably neither malignant nor villous, growing from the prostate.

October 23 I explored the bladder. The finger on entering the bladder pushed before it a smooth body which was found to be of doughy consistence, globular form, about as large as a walnut, and attached by a rather narrow pedicle to the upper margin of the urethral orifice.

The symptoms were thus clearly explained; for

¹This patient, who passed out of my hands a year ago, died August 16, 1886. At the autopsy there was found some tuberculosis of both lungs and advanced tuberculosis of the right kidney, but little of the renal tissue remaining; the left kidney was enlarged, fatty, but not tuberculous; prostate and bladder apparently free from tubercles.

Until shortly before death there were no symptoms, subjective or objective, to indicate which kidney was the seat of the disease.

the tumor—suspended against the urethral orifice by its narrow pedicle—evidently acted like a valve; for while it was readily pushed aside by the catheter from without, it effectually prevented the escape of urine from within the bladder, and thus produced the symptoms of a tight stricture.

Query—Are there not possibly cases of similar nature circulating around among surgeons and labeled “spasmodic stricture”?

Presuming that it was a fibrous or mucous polyp, I inserted through the wound a small stone forceps with the intention of twisting off the pedicle. While I was introducing my finger alongside of the forceps in order to control its extremity, about half an ounce of watery fluid (which I then supposed was urine) escaped from the bladder. I then discovered that the tumor had disappeared; but by a careful search I found a very delicate membrane, evidently a collapsed cyst, resting against the bladder wall. As I could not seize it with any instrument at my disposal, I tore the sac as completely as possible with the finger nail.

For two days subsequently the patient suffered excruciating pain along the urethra; but his convalescence was unusually rapid, the wound being entirely healed on the 9th day. At first he was compelled to urinate every two or three hours, day and night; but this discomfort—apparently a mere habit of the bladder—gradually disappeared. For four months past his urinary functions have been perfectly painless and normal.

Case 5.—M. W., 38 years old, was admitted to the County Hospital November 3. For several months he had experienced pain and difficulty in urinating, alternating with incontinence. His urine contained much pus; his bladder was sometimes distended, and at other times empty; there was no stricture nor prostatic enlargement. For several weeks before admission he had suffered from irregular chills followed by fever and sweating; his general health was much impaired; his condition in short was that described as “typhoid.”

It was evident that he was suffering from cystitis and pyelitis, though I was unable to recognize the cause; nevertheless I considered perineal urethrotomy justifiable as a means of relief from this condition.

November 14 the bladder was explored and drained; nothing abnormal was found. Yet the expected results were attained; the chills and fever ceased, pulse and temperature became normal, the appetite returned, the urine became clear, in short the cystopyelitis subsided. After his convalescence from the operation when the patient again began to walk, I discovered the cause of his cystitis—namely an incipient transverse myelitis. Had he not been confined to his bed upon admission to the hospital, I would probably have detected this lesion; yet I would just as certainly have performed the operation, since without it he would soon have died of suppurative nephritis, the danger of which was now removed.

Cases 6, 7 and 8 were unfortunately instances of malignant tumor of the prostate and bladder. Two were men aged 69 and 58 years, respectively; in each of these the diagnosis—which was rendered al-

most certain by the history and physical examination—was made absolute by the discovery of numerous atypical epithelial cells in the urinary sediment under the microscope. The older of these two men was already bedridden from exhaustion when I first saw him; in this case I made perineal urethrotomy, and inserted a drainage-tube merely to obviate the agony of frequent urination. Such great relief was secured that the drainage was maintained until his death, three months later.

In the second case the patient was seen at an early stage of the malignant disease. Having located the growth in the left lobe of the prostate, I explored the bladder to ascertain the feasibility of an attempt at removal, intending, if excision of the neoplasm with the cautery seemed practicable, to make also a supra-pubic cystotomy for additional facility of manipulation. I found, however, that the growth not only involved the left lobe of the prostate, but was also prolonged, as a small, firm ridge, along the posterior wall to the vertex of the bladder. I therefore made no attempt at removal. The wound healed readily; the patient is still—four months later—able to walk, though steadily sinking under the malignant disease.

The third case of prostatic cancer presented an instructive feature. It was that of a man 31 years old, admitted to hospital with a violent and fetid cystitis and almost complete retention of urine. Per rectum the prostate was found greatly and irregularly enlarged, hard and knotty, making the diagnosis easy. Although large instruments readily entered the urethra as far as the prostate, I was unable to pass even the smallest catheter over the prostatic obstruction. I performed membranous urethrotomy and inserted a drainage-tube into the bladder.

Almost complete suppression of urine ensued; and in spite of fomentations to the loins and pilocarpine internally, the patient died of uræmia on the fourth day. At the autopsy there was found an epithelioma involving the prostate and floor of the bladder; the vesical walls were enormously hypertrophied, the kidney calyces were greatly dilated, and there was a pipe-stem calculus in the left pelvis. This case exemplifies the danger—not yet sufficiently recognized—of emptying the bladder in cases where, from long obstruction to the exit of urine, the bladder walls have become hypertrophied and the kidney pelves distended.

Case 9.—X. C., 59 years old, was admitted to hospital February 3, 1885, in the last stages of chronic cystitis, from which he had suffered for fifteen years. He had repeatedly had complete retention of urine; for five years has been obliged to urinate every hour or oftener, day and night, and for more than a year past has been practically unable to void urine except through a catheter. On admission he was in a typhoid state and suffering from irregular chills, fever and sweats. After vainly trying for several days to improve his condition by washing out the bladder, I made perineal urethrotomy February 9, and drained in the usual way. Immediate and complete relief was secured; on the second day his temperature became and remained normal.

Finding the cause of the cystitis in an immense

myoma—or so-called hypertrophy—of the prostate, I seized the opportunity to execute a plan which I had long cherished, namely, to make an artificial channel through the obstructing portion of the prostate.

Accordingly, two weeks later I reopened the perineal wound and with the galvano-cautery made a channel through the prostate sufficiently capacious to admit easily an ordinary lead pencil. To my surprise and gratification the patient showed absolutely no reaction, his temperature never exceeding 99° F. After the wound healed he easily retained urine three to four hours, and passed water without pain and without a catheter; the residual urine was reduced from eight ounces to half an ounce, showing that the bladder almost completely emptied itself; the urine was quite clear, even after standing. In short, he left the hospital April 3 a new man.

In consequence of the habitual retention of a little urine, I directed him to use the catheter once daily, an injunction which, after returning to his home, he usually ignored. As a consequence he had on two occasions during the following summer slight indications of cystitis, which, however, quickly subsided when the catheter was used once or twice daily.

September 12 he suddenly manifested signs of acute uræmia, of which he died, nearly seven months after the operation.

The uræmia was explained at the autopsy by the discovery of very small, contracted kidneys. I also secured the bladder and prostate, which are here submitted for your inspection.

Case 10 was a man 68 years old, with the usual history of cystitis from prostatic enlargement, extending over seven years. Although he was in a very exhausted condition, I attempted to repeat the operation of channeling the prostatic obstruction practiced successfully on the former patient (*Case 9*). In the midst of the operation the battery failed, so that my design could not be executed. The patient's ability to urinate and his comfort were decidedly increased by the incomplete operation; but his health did not improve, and he died some two months later.

The value and safety of digital exploration of the bladder through the membranous urethra as a means of diagnosis and treatment, are so clearly exemplified in these cases that I shall expend no time in expatiating upon them. I would merely remind you that the cases are in no wise selected ones, but are recorded as they successively occurred; that the majority of the cases belonged to that class of ill-conditioned individuals who drift into the wards of a large charity hospital; and that five of the ten were brought into the hospital in an apparently hopeless condition, to die.

Of the ten, three died within two months after operation; in one of these—the case of prostatic cancer, where death ensued in four days, from uræmia—the fatal result was unquestionably hastened and directly caused by the operation, though without operation this man could not have lived many days. In the two other fatal cases—where death occurred some two months later—it is just as certain that the operation prolonged life; and had it been performed a year or two earlier, before the patients had become

so exhausted, it would have been extremely beneficial.

As essential preliminaries to a diagnostic exploration of the bladder, I would adduce two considerations:

1. It should not be performed as a diagnostic measure until it is reasonably certain that the seat of the difficulty is in the bladder, or until all other and less radical diagnostic means, including the microscope, have been exhausted; otherwise it may yield only disappointment and regret to both surgeon and patient. For it must be remembered that an irritable condition of the bladder can be produced by causes without as well as within this viscus, such as stricture of the anterior urethra, tuberculosis or calculi of the kidney-pelvis, etc. In such cases the morbid symptoms may be exhibited chiefly or exclusively by the bladder, while the lesion lies chiefly or exclusively elsewhere. As examples I would mention my own case of tuberculosis, and the two cases of exploration of the bladder which I have seen performed by other surgeons; in both of these the operation was ill-considered and fruitless, since in each the lesion evidently lay in the renal pelvis.

2. The operation should never be performed until the bladder has been accustomed to complete evacuation, by catheter or otherwise. If in consequence of a tight stricture or prostatic obstruction, the bladder is much hypertrophied, membranous urethrotomy is dangerous, not from a probability of urinary extravasation, but simply because a cysto-pyelitis of more or less gravity—possibly even anuria—usually follows the sudden removal of the accustomed high pressure in the bladder and kidney pelvis. Examples are found not only in my own fatal case of anuria, but also unfortunately in the daily introduction of catheters for retention, division of tight strictures, lithotomies, etc. Therefore, before the bladder is explored in a case with tight stricture, prostatic enlargement or other cause of vesical hypertrophy, the bladder should be gradually accustomed, in the course of weeks, to complete evacuation; the stricture should be enlarged; or the prostatic obstruction should be overcome by the habitual use of the catheter until all residual urine is withdrawn. Then, and *not till* then, can the surgeon rest assured that digital exploration of the bladder from the membranous urethra, whether it afford much or little benefit, will at least be safe and devoid of injury.

ON THE RADICAL CURE OF INGUINAL HERNIA. A REVIEW OF THE EXISTING STATUS OF THE OPERATION, WITH REMARKS ON ITS PAST HISTORY.¹

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Few subjects are more attractive to the surgeon than that of hernia, whether viewed from the standpoint of pathology or that of surgical therapeutics. The ablest surgeons in past ages, as I shall presently

¹ Read before the Chicago Medical Society, August 16, 1886.