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An Operation for Valvular Stricture of the Ureter.

BY

CHRISTIAN FENGER, M.D.,
OF CHICAGO.

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AN OPERATION FOR VALVULAR STRICTURE OF THE URETER.

By Christian Fenger, M.D.,
of Chicago.

In cases of hydronephrosis or pyelitis with distention (pyonephrosis) it is not uncommon to find comparatively narrow or thin-walled, semilunar valves located transversely in the ureter. These open upward and have the same mechanical action as the valves in veins, and stop the passage of liquid through the ureter on its way from the kidney to the bladder. These valves are sometimes single and sometimes multiple, two or three in the same ureter. They have been depicted in Rayer's atlas,[1] and are not uncommonly mentioned in the descriptions of specimens in the literature. They cause a gradually increasing impediment to the flow of urine, and effect dilatation of the ureter above and usually near to the valve, so that a ureter with multiple valves will present as many dilatations and constrictions as there are valves. It is natural that if small stones form in the kidney, they should be arrested at the valves.

That such a valve can be successfully operated upon from within the ureter through a longitudinal incision in the latter is well illustrated in the following case:

Case. *Synopsis: in* 1880, *at the age of seventeen years, probably traumatic right floating kidney; remittent attacks of pain, reawakened after first pregnancy, in* 1885, *to disappear for eight years, returning in* 1893, *subsequent to miscarriage, to become intermittent or almost constant; pyonephrosis, with tumor in region of right kidney; pelviotomy August* 6, 1895; *removal of four stones from ureter above a valvular stricture; longitudinal ureterotomy over stricture; excision of stricture; plastic operation on ureter; wound in pelvis left open for bougie passed down into ureter; wound healed without fistula in six weeks; patient well in March,* 1896, *seven months later.*—Mrs. G., aged thirty-two years, was referred to me by the courtesy of Dr. E. E. Simpson, and entered the German Hospital, in my service, August 1, 1895. The patient's family history was good. She had had the ordinary diseases of childhood, but was in other respects in excellent health until her seventeenth year. At this time, after jumping from a wagon to the ground, she at once experienced pain in the right side immediately under the ribs, so severe that she fainted. She was not confined to her bed, and the pain was not constant, but after an intermission of several days intense pain, lasting from a few hours to several weeks, would recur. The pain was located in the right

[1] Rayer: Traité des Maladies des Reins, Paris, 1837.

hypochondriac region. No blood was noticed in the urine or stools either immediately following the injury or subsequently.

Menstruation commenced at the age of eighteen years, and she was fairly regular and had comparatively little pain or discomfort. She married at twenty-one years; has two children. After the birth of the first child the pain in the side again became quite severe, but during her second pregnancy she complained of little pain. The second child was born three years after the birth of the first, after a tedious labor. On the third or fourth day she had a chill, followed by fever, and during the six weeks following had fever and intense pain in the back, the left half of the abdomen, and the joints in various parts of the body. During the first week after her confinement a large slough, four inches in length, extending from the anus upward over the sacrum, occurred. Five weeks later the gangrenous tissue was removed, but the wound did not heal for three months and a half. During the next four years the patient had three miscarriages. At the time of the last miscarriage, in 1893, the patient had the same pain that she had had fifteen years previously in the right hypochondriac region, ranging to the median line.

The patient was somewhat emaciated; heart and lungs normal; abdominal examination revealed an obscurely defined tumor in the right side of the abdomen, close to the umbilicus, four inches long by three inches wide, dull upon percussion. The tumor was readily movable to the median line and backward to the normal position of the kidney, but attempts to move the tumor caused considerable pain. Vaginal examination showed that the uterus was somewhat enlarged, but in normal position, and not freely movable. Pressure over the ovaries caused only slight pain. The urine contained neither albumin nor sugar.

During the attacks of pain she urinates frequently, but passes only small quantities of urine. The pain always begins in the right lumbar region, and from here radiates to the epigastrium, anterior part of chest, right and left inguinal regions, and also sometimes into the leg. She has lost forty pounds in weight during the last seven years.

Diagnosis. Cystonephrosis of right movable kidney, probably due to stone in kidney or pelvis. Probably infected.

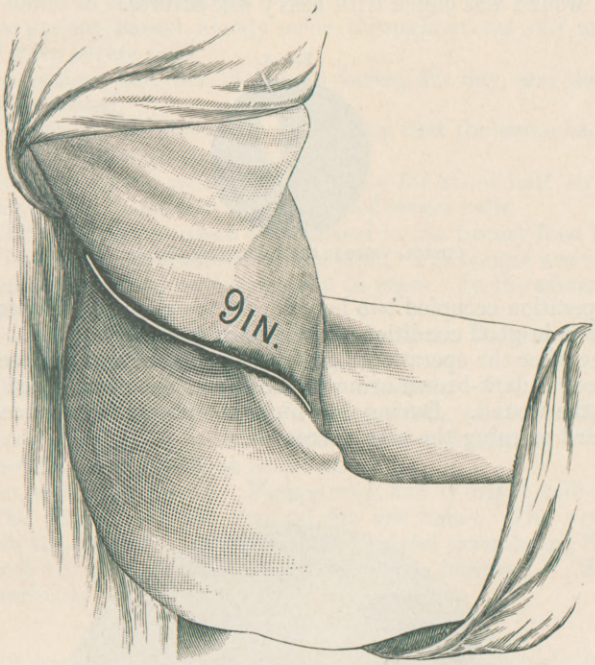
I therefore advised exploratory incision for drainage and possible removal of stones.

Operation. On August 6th I operated in the following manner: the patient was anæsthetized with ether and placed on the left side on a cushion. An incision was made between the twelfth rib and the rim of the pelvis forward for about nine inches from the border of the erector spinæ muscle. (Fig. 1.)

The kidney was large with but little perirenal fat, and was freely movable. Two small cysts presented on the convex surface of the kidney, about the size of a pea, which contained clear fluid. A part of the kidney-tissue which included these cysts was removed for examination. After isolation of the pelvis, which I found to be somewhat dilated, but in which I could feel no stones, I laid bare the ureter and felt a nodular mass two inches below the pelvis. I then incised the pelvis longitudinally and about an ounce of urine escaped, from which cultures were made. I could now insert my little finger down into the dilated ureter for an inch without feeling a stone, but upon manipulation of the ureter with the other hand I was able to squeeze four stones up into the pelvis and remove them through the wound in the pelvis. (Fig. 2.) A

sound passed down from the pelvis into the ureter was arrested two and a half inches below the pelvis, at a point where a somewhat soft thickening was felt on palpation. A longitudinal incision was now made three-eighths of an inch long into the ureter upon the end of the sound

FIG. 1.



Line of incision when wound was nearly healed.

above, through and below a transverse valvular stricture. A probe inserted through the opening in the ureter below the stricture passed easily down into the bladder. By holding the longitudinal wound open and stretching this part of the ureter over the index-finger I clipped off the

FIG. 2.

Stones from ureter above stricture; natural size.

valvular stricture (Fig. 3) from within the ureter with scissors, leaving the muscular and internal coats of the ureter intact. I now made my plastic operation on the ureter[1] and inserted a flexible bougie, No. 12, from the wound in the pelvis into the ureter. The wound in the pelvis was left open. Upon digital exploration of the calices through the wound in

[1] Fenger: Journal of the American Medical Association, March 10, 1894.

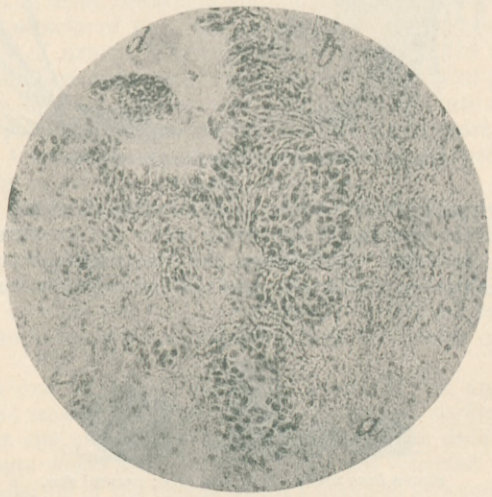
the pelvis I found the calices moderately dilated, and in one of them a small stone, which I removed. No other stones were found after careful examination. On this account I did not consider it necessary to incise the kidney on its convex surface. Rubber drainage-tubes were then inserted, one down to the wound in the ureter, and another to the pelvis of the kidney. These tubes were surrounded with gauze. The external wound was closed with heavy silk sutures.

FIG. 3.

Circular valve in the ureter; natural size.

The operation occupied two hours. At the close of the operation the patient was in good condition, pulse strong, respiration good. She vomited twice after the operation. In the evening she was catheterized and two ounces of dark-brown urine withdrawn. She complained of severe pain in the wound. During the night she passed four ounces of urine and toward morning the pain decreased.

FIG. 4.



Microscopic section of valve.

Microscopical examination of the valve (Fig. 4) showed that this consisted of firm fibrillary connective tissue, with normal distribution of vessels (*a*), no muscular fibres of the wall extending into it. The free border of the valve looking into the lumen of the ureter (*d*) was clad with stratified cylindrical and cuboid epithelium (*b*). The border of

the valve was folded, and thus a cross-section through the bottom of a fold showed an island of cuboid epithelial cells (*c*).

7*th*. The patient vomited several times, complained of severe pain in the afternoon, and passed bloody urine. During the twenty-four hours she passed sixteen and a half ounces of urine. She complained of severe pain in the wound, but was otherwise bright and cheerful. Considerable discharge found in the dressings.

8*th*. The patient passed bloody urine throughout the day and complained of very severe pain.

9*th*. The patient had but little pain during the day, and the nausea and vomiting ceased.

10*th*. The gauze was almost dry, indicating that the urine had passed along the bougie through the ureter.

11*th*. The patient was perspiring profusely for about half an hour in the evening, and a little later complained of severe pain.

12*th*. Thirty ounces of urine were passed in the twenty-four hours.

13*th*. The patient complains of severe pain. The bougie was removed, but the drainage-tube allowed to remain in place. In the afternoon she complained of severe pain.

15*th*. The patient complains of sharp pain in the bladder at the close of urination and also of pain in the wound.

20*th*. Condition of wound and patient excellent.

26*th*. No urine in the dressings. Drainage-tube to the pelvis of the kidney removed and tube to the wound in ureter shortened.

September 1*st*. Drainage-tube removed.

8*th*. The patient sitting up. Feels strong, and is bright and cheerful.

20*th*. The patient left the hospital for her home. The wound was healed with the exception of a narrow superficial granulating line.

On March 19, 1896, Dr. Simpson wrote me as follows: "Mrs. G. is doing remarkably well."

It will be seen that the operation for infected cystonephrosis in this case was not nephrotomy, as the convex surface of the kidney was not divided at all. Pelviotomy (opening of the pelvis) was made, partly for the removal of the stones squeezed up out of the ureter and partly for the exploration of the ureter and calices.

Exploration of the ureter with the sound led to the detection of the stricture, a valve, which was excised through a longitudinal opening in the ureter at its seat. I consider this operation preferable to excision of the entire wall of the ureter and invagination after Van Hook's method, as it is followed by the least possible shortening of the canal. This point may be of importance if more than valvular stricture should have to be operated upon.

Exploration of the calices can be made just as well through an incision in a somewhat dilated pelvis when the latter is wide enough to permit exploration with the finger and sound. For additional security against leaving stones in hidden calices with narrow entrances it would be well to explore through the convex surface of the kidney with steel needles. When this is done in addition to digital exploration through

the pelviotomy-wound I think there is as little risk of overlooking stones as exists when the convex surface of the kidney is divided. To avoid dividing the posterior surface of the kidney avoids hemorrhage, the operation on the pelvis of the kidney being entirely bloodless.

For the local treatment of pyelitis—that is, inflammation of the pelvis and calices—drainage through the wound in the pelvis will be sufficient, at least in ordinary cases of stones and valves in which, by removal of the cause, we may reasonably expect the pyelitis to come to an end.

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