UPON
TWO CASES OF URETERO-LITHOTOMY.

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IN bringing these two cases of removal of calculus from the ureter before the notice of this Society, I would note that only a very few cases of the kind have been recorded, and that as operations of this nature are comparatively rare, all cases should be recorded in order that the proceeding may be put upon a more definite footing than it is at present.

The first case I have to record is that of Mrs. M—, sent to me by Mr. Wyllys, with symptoms of stone in the pelvis of the right kidney. The patient was sixty-one years of age, and was very stout. The kidney was explored on March 13th, 1893, when eighteen or twenty calculi were removed, the largest of which weighed over 200 grains. The kidney wound healed up in about ten days, and everything appeared quite satisfactory. She got up on April 15th, and that evening had a severe attack of renal colic on the right side. Very severe attacks of colic occurred at intervals for the next twelve days; and thinking, therefore, that there must be another

stone in the kidney which had escaped notice at the time of the previous nephro-lithotomy, I again explored the kidney on April 27th, but with a negative result. A probe was also passed about four inches down the right ureter, but did not hit any stone. In August her condition was as follows :—There was a renal fistula in the right loin, which had existed since the last operation. There was tenderness on pressure over the right inguinal region, but no acute attacks of pain. Vaginal and rectal examination failed to detect anything like a calculus impacted in the lower end of the ureter. Having determined that a calculus was impacted in the ureter between the points explored, on August 3rd I cut down upon it by an incision similar to the one used in the dead-house for tying the common iliac artery. The peritoneum was stripped up, and carried the ureter forwards with it. Owing to the obesity of the patient the wound was a very deep one, and it took a little searching to find the ureter. When this was recognised I traced it downwards towards the bladder, and, just beyond the level of the brim of the true pelvis, found the stone. With the finger and thumb I worked the calculus upwards until it was opposite the incision, and in a more manageable position, when I

extracted it through a small longitudinal incision. The wound was then closed in the ordinary manner, a drainage-tube being put in at the lower angle. The ureter was not sutured. No urine escaped by the wound, which quickly healed up.

The calculus removed weighed four grains, and was very irregular in outline.

The second case is that of Mrs. W—, aged forty-four. She came under my care for internal piles, which I removed. When convalescent from this operation she told me that she had pain after passing water, and upon examining her bladder with a sound I detected what I took to be a foreign body coated with phosphates, as it did not give a clear clicking sound on being struck.

Upon April 14th the patient was anæsthetised, but no stone or foreign body could be detected by the bladder sound. However, being sure that there was something in the bladder, although I failed to detect it with the sound, I dilated the urethra with Hegar's uterine dilators, and upon exploring the bladder with the finger two calculi could be felt impacted in the lower end of the right ureter. They did not project into the bladder. I removed them by cutting down upon the ureter through the roof of the vagina. No urine escaped through the wound, which quickly healed. The ureter was not sutured. The stones weighed fifteen grains, and from their appearance I should judge that they had been there some time. Indeed, I find that the patient had a severe attack of right renal colic last July, but did not pass a stone afterwards.

I have been able to discover ten other recorded cases of uretero-lithotomy, as given in the following table.

On glancing through the accompanying table, it will be seen that impaction occurred in three of the cases about two inches below the kidney: at the lower end of the ureter just before or whilst perforating the bladder wall in three cases, whilst in the remaining six the stoppage took place somewhere about the level of the brim of the true pelvis, where the ureter makes a turn forwards.

It may also be noted that all the cases recorded, where the impaction has taken place at the lower end of the ureter, have occurred in women, and up to the present no case has been noted of uretero-lithotomy in the male for stone impacted in this situation.

Recovery has occurred in all the cases except the two recorded by Thornton; in one of these death does not appear to have been due to the uretero-lithotomy, as the stone was extracted from the left ureter immediately after removing the right kidney for calculous pyo-nephrosis. In the other fatal case the urethra was dilated, and the

Table of Cases of Uretero-lithotomy.

Operator.	Sex.	Age.	Position of stone in ureter.	How removed.	Treatment of ureter.	Result.	Where recorded.
1 Kirkham	M.	58	$\frac{1}{2}$ inch above where it crosses external iliac vessels	Extension of nephrotomy wound	Not sutured	Recovery	Lancet, March 16th, 1899.
2 Twynam	M.	8	2 inches from bladder	Incision similar to ligature of common iliac	Sutured	"	Brit. Med. Journ., Feb. 1st, 1890.
3 Godlee	F.	26	2 inches below kidney	Nephrotomy incision	"	"	Trans. Clin. Soc., vol. xxii.
4 Arbuthnot Lane	F.	—	Where it crosses external iliac vessels	Laugenbuch's incision	"	"	Lancet, 1890, Nov. 8th.
5 Bardenheuer	—	—	Middle third	Flank incision	"	"	Centralblatt für Chirurg., March, 1892.
6 Thornton	F.	—	Lower end	Dilatation of urethra; removal through bladder	—	Ureteral fistula; death in 14 days, from exhaustion	Harveian Oration.
7 "	F.	—	Halfway down	Found during removal of right kidney by abdominal operation; removed by small lumbar incision	Not sutured	Death 6th day; broncho-pneumonia	Ditto.
8 Cabot	M.	40	2 inches below kidney	Nephrotomy incision	"	Recovery	Boston Med. and Surg. Journ., 1890, p. 247.
9 "	F.	39	Lower end	Through roof of vagina	"	"	Ditto, p. 613.
10 Hall	F.	—	2 $\frac{1}{4}$ inches below kidney	Diagnosed by abdominal section; removed by lumbar incision	"	"	Trans. Amer. Assoc. Obst. and Gyn., 1890.
11 Cotterell	F.	61	Little below where it crosses external iliac vessels	Incision similar to ligature of common iliac	"	"	This paper.
12 "	F.	44	Lower end	Through roof of vagina	"	"	This paper.

stone cut out through the bladder, but a ureteral fistula resulted, the urine discharging into the pouch of Douglas. The woman went out of her mind, and died of exhaustion a fortnight later.

Impacted stone in the ureter gives rise to symptoms very like those of stone in the kidney, and in all the recorded cases where the stone was impacted somewhere in the upper three fourths of that tube the kidney has been explored first, with the expectation of finding a calculus there, and it has been owing to the negative evidence resulting from this measure that exploration of the ureter has been undertaken. Pain is a prominent symptom, renal colic being well pronounced. When the stone becomes impacted at any point the pain is generally most severely felt at this particular part. There may be frequency of micturition, or the very reverse condition may occur from suppression of urine ; and in this case, if the impacted calculus is not removed, uræmic symptoms will supervene.

The lower portion of the ureter can be felt and explored in the female by the vagina, and in the male by the rectum, but in the latter only the last half or three quarters of an inch can be so felt.

Given a large stone and a thin person it might be possible perhaps to feel the stone through the abdominal walls, but this is very doubtful, though the site of the impaction may be sometimes more or less localised by the patient's sensations during abdominal palpation ; for a constant tender spot at one point, with pricking pain when that spot is manipulated, will generally determine the whereabouts of the stone. In two cases (Hall and Lane) the diagnosis has been made and the situation of the stone determined by abdominal section.

The question now arises, what is the best way to remove a calculus which is impacted in the ureter ? In the case of stones within two to three inches from the kidney, they simulate so closely stone in that organ that a nephrotomy will be generally performed, and failing to

find a calculus there, the upper part of the ureter can be explored through this wound.

When the stone is impacted lower down—that is to say, from three inches below the kidney to about two inches from the lower end, the ureter can be explored by an incision similar to that by which one is taught to tie the common iliac artery. It is important to bear in mind the relation of the ureter to the peritoneum, for the former is adherent to and always strips up with the latter, when this is separated from the parts behind. If the right side is being operated upon, the proximity of the vena cava should be remembered.

The last two or three inches of the ureter can be reached in the female by an incision through the roof of the vagina without opening the peritoneal cavity, and this is preferable to extracting the stone through the bladder. If a stone is impacted in this region in the male, I would suggest that it can be reached by an incision similar to that proposed by Zuckerkandl for the removal of the seminal vesicles. This consists of a semicircular incision in the perinæum, separation of the anterior surface of the rectum, incision of the anterior fibres of the levator ani so as to lay bare the prostate, when, by means of a sound in the bladder, the base of that viscus can be made prominent in the wound, and a little dissection on one side will expose the lower end of the corresponding ureter.

There does not seem to be any object in stitching up the wound in the ureter, but care should be taken to make the incision into it as small as possible. Wounds of the ureter heal very readily, and the suture might become the nucleus for a future calculus.

[*Note*.—Since the foregoing paper was written, Mr. Wheelton Hind has recorded ('British Medical Journal,' vol. i, p. 960) a case of total suppression of urine due to a calculus impacted in the upper end of the right ureter; the left kidney being atrophied, with the pelvis enclosing a calculous deposit weighing 360 grains. The impacted

calculus was removed by an incision down to the kidney in the right loin, and then cutting on to the stone in the upper part of the ureter. A nephro-lithotomy was afterwards performed as there was a calculus in the pelvis. The ureter wound was not sutured. The patient died fifty-eight hours after the operation.]

(For report of the discussion on this paper, see 'Proceedings of the Royal Medical and Chirurgical Society,' Third Series, vol. vi, p. 103.)