

SIMULTANEOUS LIGATION OF BOTH EXTERNAL ILIAC ARTERIES FOR SECONDARY HEMORRHAGE FOLLOWING BILATERAL URETEROLITHOTOMY.*

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THE case I am about to report presents so many points of unique interest, that I have deemed it of sufficient importance to place on record.

S. W., act. 36, Austrian, was referred to me in March, 1907, by Dr. B. Lefkovich, with the diagnosis of nephrolithiasis. I shall introduce only the important data in outlining the history of the case. Ten years ago he was seized with an attack of sudden left-sided abdominal pain, followed by vomiting; at the time this attack was diagnosed as appendicitis. These attacks recurred at intervals of about two years. About two and one-half years ago similar attacks began also upon the right side, and attacks upon both sides of the abdomen have recurred at varying intervals up to the present. The later attacks are described by the patient as beginning in the back and radiating toward the front, to the bladder and testis and corresponding thigh. The attacks are associated with frequent urination and high colored urine. An X-ray plate taken shortly before I saw him, at the suggestion of Dr. Hy. W. Berg, showed four calculi in the ureters, two on each side, and an indistinct shadow in the region of the left kidney. The urine was alkaline, contained albumin, considerable pus and a few red blood cells.

Operation was advised, but the patient left for Europe and was operated on in Vienna by Zuckerkandl June 15, 1907, for the left-sided renal calculus. The other calculi were apparently undiscovered, although the patient avers that a number of X-ray exposures were made while at the clinic. It is of interest to note that

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eleven days after this operation an attack of right-sided renal colic occurred, which was regarded by Zuckerkandl as an example of contralateral pain. Since this operation the patient has had frequent attacks of renal colic alternating on both sides.

In January, 1908, he again came under my observation. A Röntgen plate made at this time showed bilateral ureteral calculi in the pelvic portion of each ureter. I operated on him July 20, 1908.

Operation.—*Bilateral ureterolithotomy, removing two calculi from the pelvic portion of each ureter.*—Through lateral extra-peritoneal incisions, and after dividing the aponeuroses of the external oblique in the course of its fibres, and the internal oblique and transversalis muscles across their fibres, the ureters were readily exposed; the calculi were easily found and removed through small longitudinal incisions. The ureteral incisions were closed by interrupted iodine catgut sutures. With the exception of one minute bleeding vessel in the retroperitoneal tissue not a single ligature had to be tied. As drainage I used a red rubber drainage-tube, about the size of the tip of the small finger, through which a strip of iodoform gauze had been pulled, which was placed against the suture lines in the ureter; the tube emerged naturally at about the junction of the middle and lower third of the cutaneous incision. Layer suture of the divided abdominal parietes completed the operation. The operation was one of the easiest I had ever performed, the entire duration of the completed operations being only 55 minutes.

The patient did very well for the next few days, except that on the third and fourth day there was rather more hæmaturia than I am accustomed to see after ureterotomy; this soon cleared up, however, and had entirely ceased on the fifth day. There was a minimal urinary leakage on the right side, just enough to slightly dampen the centre of the dressing. Primary union ensued, and the stitches were removed on the sixth day.

On July 27, one week after operation, the left drainage-tube was removed. The tube came away easily, but it was immediately followed by a tremendous hemorrhage, which stopped for an instant, and then recurred in sufficient quantity to fill a two-quart pus-basin half full. I promptly introduced a finger, which controlled the hemorrhage at once.

The patient was then anæsthetized, and the wound reopened.

A hole sufficiently large to admit the tip of the little finger was found in the external iliac artery, at a point where it was pressed upon by the drainage-tube. The vessel was ligated above and below the hole with a No. 3 catgut ligature. The wound was then lightly tamponed with gauze.

I was beginning to congratulate myself upon the fortunate outcome of a disagreeable accident, when I lifted up the sheet with which the patient was covered; the sheet happened to catch in the safety pin, which pierced the tube upon the right side and pulled out the tube for certainly not more than half an inch. There promptly ensued an identical hemorrhage. The same conditions were found on this side, and exactly similar steps were resorted to to control the hemorrhage.

It is, I am sure, needless to say, that all pulsation ceased below the seat of the ligature, and both lower extremities became blanched. After the usual abdominal dressings were applied, both lower extremities were wrapped in cotton and bandaged, and patient placed in bed, with legs and trunk slightly elevated.

Despite the formidable hemorrhages, and in spite of the enormity of the operation the general condition of the patient was very fair. On the evening of the same day the toes were warm, of a delicate pink hue, and capable of slight active motion. On the following day slight femoral pulsation was to be felt, and on the third day an occasional flutter was noted in the dorsalis pedis artery. Thereafter his convalescence was entirely uneventful, and patient left the hospital with superficial granulating wounds on September 4; these have now healed entirely.

On the date of writing the above, September 30, the incisions are firmly healed; there is no hernia; pulsation can be felt in both femorals and dorsalis pedis arteries, though somewhat smaller than in the normal.

The points of exceptional interest in this case are the following:

1. That a bilateral secondary hemorrhage from the external iliac arteries was caused by pressure of drainage tubes.
2. That a simultaneous and successful ligature was performed upon both external iliac arteries.

In a cursory examination of the literature I have not been able to find a similar occurrence described, as the one that I have reported. Secondary hemorrhage caused by pressure of drainage

tubes has been described before and has been warned against, particularly in incisions upon the neck. I have also not been able to find another case of simultaneous ligation of both external iliac arteries. Both external iliac arteries have been tied by Makins (*Lancet*, Dec. 2, 1892, and July 22, 1893) for bilateral femoral aneurism at an interval of seven and a half months. In Tillmann's "*Verletzungen und chirurgische Krankheiten des Beckens*" I also find a reference to a case by Watson in *Agnew's Surgery*, 1878, vol. i, page 667. On referring to the original report, however, I find that Watson merely tied one external iliac. My case therefore appears to be the first case of simultaneous ligation of the external iliacs, successful or otherwise.

It would carry me far beyond the limits of this communication to discuss the probable routes of the re-establishment of the collateral circulation. Sir Astley Cooper's classic case in *Guy's Hospital Reports*, vol. i, gives the collateral circulation eighteen years after ligation of one iliac to be as follows: (1) An anterior set; a branch from the ileolumbar artery communicates with a branch of the circumflex iliac; a branch from the ileolumbar artery with a branch from the obturator; two branches of the obturator artery with the epigastric and the internal circumflex of the deep femoral artery. (2) An internal set, branches of the obturator artery communicating with the internal circumflex branch of the profunda femoris. (3) A posterior set, branches from the gluteal, communicate with an ascending branch of the external circumflex; branches from the sciatic communicate with the internal and external circumflex and perforating branches of the profunda femoris. In cases of injury, similar to the one I report, there is also the important communication of the deep epigastric artery with the internal mammary. In my case the anastomotic circulation was restored very quickly, inasmuch as the dorsalis pedis artery had already begun to pulsate on the third day.

Excluding the interesting anatomical and physiological lessons involved, this case above all teaches the very important lesson, that drainage-tubes should be introduced in this locality with great circumspection or better not at all.

The case gave me some very anxious moments, and the patient can well be congratulated upon the fortunate outcome.