

# BULLETIN

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## URETERO-URETERAL ANASTOMOSIS. URETERO-URETEROSTOMY.

BY H. A. KELLY, M. D., *Gynecologist-in-Chief, The Johns Hopkins Hospital.*

### REMARKS BY DR. BLOODGOOD.

My attention was first called about eight years ago to the dangers of cutting the ureter, in the case of a little girl, about three years old, upon whom I operated for a retro-peritoneal tumor which had lifted the ureter of one side entirely out of its normal course, displacing it upward into the lower abdomen. The most marked displacement of the ureter that I have observed since that time occurred in the case whose history forms the basis of this communication. The patient, a mulatto, twenty-five years of age, was sent to me by Dr. Cheston, of West River, Maryland. On examination I found the whole lower abdomen filled with a mass about the size of a large foetus at term, from which large nodules projected. This tumor filled the true and false pelvis and extended up above the umbilicus. The small cervix, the vault of the vagina and the bladder were drawn up into the abdomen and displaced to the left. Her temperature on admission was 37.7° C. (99.8° F.), ranging from 37.8° to 39.9° C. (100° to 102° F.) up to the time of operation. Her pulse was full and strong, varying from 74 to 120.

*Urinary examination:* color amber, flocculent precipitate, acid, sp. gr. 1018, albumen, but no casts.

*Diagnosis:* Myoma uteri.

Hysteromyomectomy was performed May 1, 1892. The large myomatous uterus was exposed immediately beneath the parietal peritoneum, and was lifted out of the abdomen through

an incision 24 cm. long. Both tubes and cornua uteri were drawn high up into the abdomen by the tumor, the round ligaments lying like guy-ropes close to the sides of the enlarged uterus. The uterus presented three myomatous masses, one about 12 cm. in diameter at either cornu uteri, and the third, 18 cm. in diameter, partly within the pelvis, below the right cornu.

I first ligated the round ligaments and both ovarian arteries and veins near the brim of the pelvis, and then opened the broad ligament and pushed its parietal layers to the front and back of the pelvis, thus exposing the uterine vessels on the floor of the pelvis. At this juncture a large flat vessel 1 cm. in diameter was exposed for about 7 cm. of its length on the anterior surface of the lower pelvic mass.

It closely resembled an engorged vein, and as it apparently terminated in the congeries of vessels at the cornu uteri, although its resemblance to a ureter was spoken of, it was doubly ligated and cut. The error was apparent at once, as its patulous lumen and thick walls showed it to be the ureter. This inference was confirmed by passing a sound downward into the bladder and upward towards the kidney.

As a result of pressure from the myoma the ureter was enlarged to four times its normal circumference, forming a well-marked hydro-ureter. On removing the upper ligature, about 20 cc. of clear urine escaped. While deciding how to

deal with this complication I completed the hysteromyomectomy in the usual way. I then turned my attention to the cut ureter. There were obviously three modes of treatment: the establishment of a urinary fistula by bringing the upper end out at an opening in the flank or in the middle of the abdomen; removal of the right kidney; or the bolder plan of anastomosing the severed ureter.

Although not aware that a successful union of a divided ureter had ever been accomplished in the human subject, I felt that I could undertake with considerable confidence a plan devised and practised successfully upon the dog by Dr. W. Van Hook of Chicago.

His method consists in tying the lower end of the divided ureter and then making a slit in the ureter below the ligature, into which he invaginates the upper end by means of traction sutures. Proceeding according to this method, I ligated the lower end of the ureter close to its cut extremity and made a longitudinal incision about 1 cm. in length in its anterior wall. I then passed a fine silk suture through the lateral wall of the lower portion, a half centimeter below and posterior to the angle of the slit, and brought it out through the slit and caught it in the outer coats of the upper end of the ureter close to its margin; this suture was then carried back into the slit and through the wall of the ureter close to the initial point of entrance. A similar suture was then passed at a point directly opposite. By making traction on these sutures while holding the slit open, the upper end of the ureter was readily invaginated into the lower. These sutures were then snugly tied. In order to avoid the danger of urine backing up through the incision, the edges were sutured to the intussuscepted portion with ten fine silk rectangular sutures, catching only the outer coat. The loose peritoneum in the anterior part of the pelvis was now drawn over the field of operation and attached to the posterior surface of the stump and the broad ligament by a continuous suture, except at the point where the ureter was united. Here two pieces of gauze were laid over the anastomosed ends and brought out at the lower angle of the abdominal wound, to insure drainage of the urine in case the operation was unsuccessful. The rest of the incision was closed in the usual manner. At no time after the operation was there the slightest urinary odor detected on the dressings, and on the third day the gauze drainage was removed. The patient had no nausea or headache or other untoward symptoms, and the convalescence throughout was uninterrupted. Abdominal sutures were removed on the eighth day; union *per primam* throughout incision.

She was catheterized every four hours the first day, and on the second passed urine voluntarily, after which the catheter

was no longer used. Albumen was present in considerable quantities before operation, but at no time following operation was there more than a trace, and the urinary record indicates only a faint trace at the time of her discharge.

The amount of urine excreted was less than 500 cc. for nine days after operation, not allowing for an uncertain quantity lost at stool. On the 27th day after operation she was excreting 1080 cc., and on the 42d day 1120 cc.

The patient was permitted to get out of bed on the seventeenth day, and was discharged in excellent health six weeks after the operation.

#### REMARKS BY DR. BLOODGOOD.

*Anastomosis of the right ureter after section in a dog. Removal of kidney and ureter two and one-half months after the operation, finding kidney normal, ureter not dilated, caliber and mucous membrane restored without stricture.*

Having heard of Dr. Kelly's successful case of anastomosis of the ureter in a woman, I decided to make the attempt on a dog. July, 1893, a large dog was anaesthetized with morphine and ether. A large incision was made in the abdomen to the right of the median line, the bowels pushed to the left, exposing the right ureter behind the peritoneum just before it crosses the iliac vessels. The peritoneum was torn, the ureter lifted from its bed, cut in two, the lower portion ligated, and a longitudinal incision of 1.5 cm. made through its ventral wall, beginning 5 cm. from the ligature. A fine straight needle, threaded with fine black silk, was passed through one lateral wall of the upper portion 5 cm. from its end. The needle then passed through the longitudinal opening in the lower portion and out its lateral wall about 5 cm. from the bladder end of the opening. A second suture was passed in the same manner on the other side. Drawing on these two sutures and invaginating the upper portion of the slit in the lower, the anastomosis was made. These sutures were tied, and two additional ones placed on each side through the overlapping portions of the ureter.

The dog made a perfect recovery.

Examination of the specimen shows overlapping at the point of anastomosis. The lower portion ends in a blind sac corresponding to its ligated end. The upper portion enters the lower at a slight angle, about 1 cm. below the blind end. The caliber is the same. The mucous membrane seems entirely restored and continuous. The upper ureter is not dilated; the kidney seems unchanged.

NOTE.—Later microscopic examination of the kidney shows no change.