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The Birth of Modern Ureteroscopy: The Albona Jaybis Story

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URETEROSCOPY WAS NOT BORN FULLY DEVELOPED. It went through many embryonic stages, adolescent growing pains, and plenty of failures and took years to become accepted. What got me started on this heretical, and at times hazardous, endeavor? Albona was her name. This is her story.

March 1976. A.J. was a 71-year-old widow who had intermittent hematuria. Her intravenous urogram (IVU) was completely normal, as was the bladder at office cystoscopy. However, with the efflux of urine from the right ureteral orifice, a papillary tumor extruded from the os, waving in the flow of urine, then promptly retracted out of sight as quickly as it had appeared, as the urine flow ceased.

When I discussed the finding with Mrs. J., her response was, "I don't want surgery with a knife; anything else is OK." So I proceeded with cystoscopy under anesthesia and coagulated the tumor as it appeared, but I had no chance to treat the base of the tumor located in the intramural ureter. I needed to view the intramural ureter directly to properly treat the tumor base, then carry out adequate follow-up surveillance.

By the time her first follow-up cystoscopy came due 3 months later, I had worked out a plan. Using a small-caliber cystoscopy, which would allow plenty of room in the urethra to pass a straight Jewett urethral sound alongside the endoscope, I would be able to direct the tip of a small sound into the ureteral orifice directly and thus dilate the intramural ureter. Dilating sequentially with 12F, 14F, and 16F sounds proved to be somewhat awkward but doable.

Then, using a pediatric cystoscope, I was able to gain entrance to the dilated ureteral orifice and the intramural ureter and even beyond, for a distance as long as the length of the instrument would allow. I was able to coagulate the area of the base of the tumor using a pediatric resectoscope loop.

At the second 3-month follow-up visit, I was apprehensive that the procedure might have caused either a ureteral stricture or free reflex up the treated ureter, but both the IVU and the voiding cystourethrography (VCUG) were normal. Employing the same approach, dilating the orifice and intramural ureter with straight Jewett sounds, I again examined the bladder and interior of the lower ureter endoscopically, and everything including the ureteral orifice looked quite normal.

According to same routine of IVU and VCUG radiographic studies, then standard cystoscopy followed by ureteral dilation and ureteroscopy at each 3-month follow-up for the rest of the year, there were no adverse sequelae. The procedures had been well tolerated. No harm had resulted from either the dilations or the 'scoping of the ureter. So a paper was sent to the *Journal of Urology* describing the technique for use in females that was published in 1978.

When a woman with a lower-ureteral stone came to me, I suggested to her that it might be worth a try to avoid an open ureterolithotomy by using a highly unorthodox endoscopic technique to approach her stone. She was game, and we did, and it worked.

Now you must remember that there were very few accessory instruments available to assist in these early procedures. No fluoroscopy in the endoscopy room. No ureteroscopic stone baskets or three-prong grabbers. No double-J stents. No video monitoring. These all were to come along later and make the procedure considerably easier and safer.

But the procedure still could not be done in men—the instruments were too short, and the urethra was not conducive to the manipulations employed in the female patient. Longer and more specialized endoscopes would be required to make the procedure successful in men. So I discussed with an American device manufacturer the instruments that would be needed. I was told they had no interest in such an endeavor.

The year was 1978.

Next, I went to a representative of the Richard Wolf Medical Instrument company with the same request. They told me to talk with their R&D man, Mr. Ludwig Bonnet. I did, and he said, "what do you need?" Two months later, the requested items arrived.

Now, ureteroscopy could be done in males with almost the same ease as in females: dilate the orifice and intramural ureter under direct vision using special bougies. A special 12F endoscope could now enter into the ureter. Ureteroscopy had advanced to include both sexes.

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Then one day, when reading an early article by Hugh Hamptom Young, I came on his vivid description of cytoscoping a young boy with bladder neck obstruction problems. He described the bladder and ureteral orifices, and because one orifice was greatly dilated, he put his cystoscope into the orifice. As the cystoscope was going easily up the ureter, he kept going, reaching the renal pelvis and observing much of its interior. No problem resulted from his ureteral adventure, but he did not report any subsequent ureteral endoscopic procedures. Hugh Young had, however, done the first ureteroscopy—in 1912!

During a subsequent conversation with Mr. Bonnet, we discussed the lengths of the endoscopes then in production. I told him they were not long enough to reach higher than the iliac vessels, but that if the endoscopes were made longer, it might be possible to reach the kidney. So he had one made long enough to reach the renal pelvis.

The year was 1981.

Now, it was possible to examine the entire length of the ureter, allowing ureteroscopy to achieve a more fertile status. Stones anywhere in the ureter now could be considered for ureteroscopic removal. However, stones too large for safe extraction ureteroscopically continued to be a big problem.

Shortly, onto the playing field came a new team member: the emerging field of endourology. Courses in endourology given at the University of Minnesota, together with the vision and enthusiasm of their course director, a resident by the name of Ralph Clayman, played no small part in the interest and advancemet of ureteroscopy through merging with many endourologic techniques. Ralph was the driving force behind the CME courses at U. Minn. training practicing urologists in percutaneous renal techniques, which concentrated on removal of renal stones. He envisioned the field of endourology as encompassing all of the endoscopic techniques that treated the urinary tract with closed controlled manipulations, as had Arthur Smith, who had defined the term. So Ralph asked that lectures and hands-on lab procedures utilizing ureteroscopic techniques be included in his courses. Thus began a warm kinship between those who approached the urinary tract from above with those who did so from below. The influence of percutaneous renal techniques on the process of ureteroscopy should not be underestimated. Techniques used in the destruction of renal stones percutaneously were now given a try ureteroscopically with only slight modification. Ureteroscopic stone disintegration revolutionized the success and acceptance of ureteroscopic stone removal. Both ultrasonic and electrohydraulic lithotripsy probes proved adaptable for use in the ureter. Stones too large for simple extraction now could be fragmented and removed safely. Guidewires, sheaths, dilators, and numerous other accessories, as well as the use of fluoroscopy during the procedure, added immeasurably to the safety of the ureteroscopy.

Open ureterolithotomy was becoming a rare procedure at the University of Chicago.

Some of the accessory instruments borrowed from percutaneous renal techniques and employed for ureteroscopy were somewhat crude and awkward when used in the ureter and deserved refinement or redesign. Two individuals stand out in this early period with their cooperative spirit and production know-how in lending assistance to the development of accessory instrumentation: Mr. Fred Romer of the Cook Co, who listened to most of the early presentations on ureteroscopy with an ear to discover what he might have his company produce to aid the process, and Mr. Jim Vance of VanTec, who had a knack for seeing a device in his mind's eye that could solve the problem brought to him by the physicians doing the procedures and then bringing it to you to try.

University of Chicago urology residents James Kyker, who was an avid photographer securing photographic images inside the ureter; Joseph Banno, who kept the spark of the new procedure alive during trying circumstances, and Jeffrey Huffman, who had hands that knew what to do and how to make things work; and a young attending named Demetrius Bagley, who saw the possibilities of percutaneous renal armamentaria that could benefit ureteroscopic procedures contributed significantly to the development of ureteroscopy.

Serendipitously, our first patient to undergo the procedure had a transitional-cell carcinoma, which required frequent surveillance and repeated ureteroscopy, thereby permitting regular checks on the safety of the procedure. This allowed us to reassure ourselves of the security of what we were doing, as critics of ureteroscopy were quite vocal and persistent. Had the first case been that of a stone, little progress would have been made in establishing the efficacy and safety of the procedure.

Mrs. J. faithfully returned for endoscopic follow-up for 14 years, until she died of her heart condition at age 85, not really knowing that she had contributed so greatly to the field of ureteroscopy.

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