

Epochs in Endourology

Ureteral Catheterization Controversies

EARL F. NATION, M.D.

EDITORIAL

EARL NATION IS A LIVING LEGEND of intellect and perspicacity. His numerous accolades include the past presidencies of the American Urological Association and the American Osler Society and the latest edition of the Ramon Guiteras award in 2002. In his inimitable mellifluous literary style, Dr. Nation narrates intriguing anecdotes from the evolution of retrograde ureteral catheterization that laid the foundation for our modern endourologic approach to the upper urinary tract.

Sakti Das, M.D.

EARLY STEPS

Physicians, like spelunkers, have always been intrigued with looking into crevices, orifices, and out of the way places. Urologists have been among the most assiduous, and most successful. The ureter and renal pelvis were among the most elusive of the dark areas.

The most accessible genitourinary interior regions, the urethra and bladder, have spawned an encyclopedic number of instruments for visualizing them. Most are long-since forgotten, and some are not to be found even in the voluminous catalogues of instrument makers of the last 125 years or that massive volume on *The History of Endoscopy* by the Reuters and Rainer M.E. Engel, published in 1999.¹ Scanning the list of European and American urologists whose names are attached to these devices leads one, at times, to believe that all our urologic forebears sought to perpetuate their names in this way.

Antonin J. Désormeaux has been called "the father of endoscopy."² In 1853, he presented to the French Academy of Medicine to the first truly workable cystoscope. However, his name is less well known to urologists than many others. Names such as Bozzini, with his Lichtleiter; Nitze, with his several cystoscopes; and Stern and McCarthy, with their resectoscope, are all well known to even the most history-phobic urologist. The names of Brown and Buerger, on whose cystoscopes many generations of American urologists depended, are basically un-

known to recent generations, who have been trained on modern instruments, incorporating fiberoptics and the Hopkins system of optics. When these urologists look through a hitherto universally used, "state of the art" Brown-Buerger cystoscope, they are heard to exclaim, "how could anyone ever see anything through this?"

THE ELUSIVE URETER

Even after cystoscopy was well established, ureteral catheterization remained a huge obstacle because of the crude optics and illumination. The challenge was as great as that which confronted Bozzini and other early urologists in trying simply to examine the urethra and bladder.

Some of the history and anecdotes relating to early endoscopy and ureteral catheterization are both interesting and amusing. Proprietary feelings for instruments, eponyms, and priorities led to some humorous confrontations among leading urologists, as well as instrument makers.

Ureteral catheterization has evoked more than its share of animosity among individuals. Max Nitze produced the first cystoscope that might have made ureteral catheterization possible. Leiter was the instrument maker whose name was also attached to the instrument. Nitze was an irascible individual who had several suits going against other urologists and resented Leiter taking any of the credit. A bitter disagreement resulted in the disruption of their relationship. Leiter's company continued to produce many endoscopic instruments in his own name for a long time thereafter.

Nitze's nature did not change. He and Hugh Hampton Young had one of the more incendiary confrontations.³ Young was visiting Leopold Casper's Clinic in 1898. He improved Nitze's cystoscope by replacing the mirror with a four-sided prism. Casper knew Nitze's temper and advised Young not to show Nitze his improvement. When Young chose to do so anyway, a violent argument ensued. Young, in *A Surgeon's Autobiography* said, "Nitze exploded . . . There came near being a knock down and drag out fight."

Nitze's cystoscope used a hot wire for improved illumina-

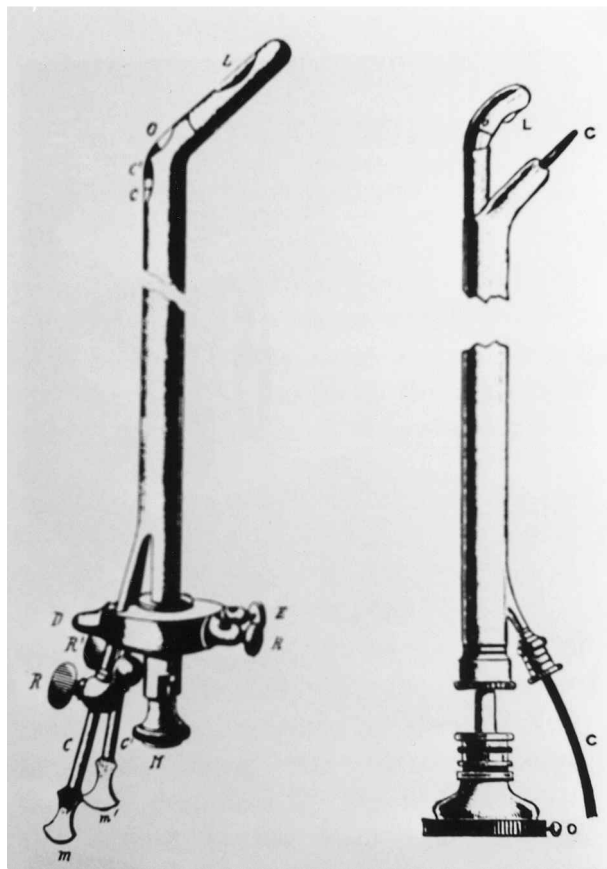


FIG. 1. Megaloscope by Boisseau du Rocher (above) and single-catheterizing cystoscope by Nitze (bottom). (From Casper & Fenwick, copied by Murphy.⁴)

tion, necessitating a cumbersome cold-water cooling system. Edwin Hurry Fenwick, who made improvements of his own, said of Nitze's "its working was decidedly fickle and its cost a great one."⁴ The heavy load of equipment required a porter to carry it about. It is depicted vividly in Murphy's *History of Urology* on page 357.

By 1887, Edison's incandescent lamp allowed the massive cooling system to be dispensed with. Fenwick and Alexander Brenner then made improvements incorporating a ureteral catheterizing channel.⁴ Even so, Brenner failed in his attempt to accomplish ureteral catheterization in the male. However, James Brown, predecessor of Hugh Young at Johns Hopkins, using Brenner's instrument, became the first American to succeed in catheterizing the ureter in a male, on June 9, 1893. His diagnosis of pyonephrosis was confirmed when Halsted removed the affected kidney. Unfortunately, James Brown did not live long enough thereafter to profit from his success: he died in 1895, at age 41, on board a ship on route to Boston, from an infection contracted in operating.⁶

The urgent need to assess the function of each kidney separately spurred efforts to perfect an instrument with which to catheterize the ureter more easily. The occasional report of the removal of what proved to be a solitary kidney added to the urgency.

In 1895, Boisseau du Rocher introduced his mégaloscope² (Fig. 1). This was the first double-catheterizing cystoscope. It was an improvement over Brenner's instrument, but the *megalo* part was its downfall. It was 27F! It engendered another feud. F. Tilden Brown, of New York, had a similar instrument, with minor changes, made in Europe in 1899. This was the first real foray by an American into this arena. It caused Boisseau du Rocher to erupt with claims of infringement.

The first American-made, indirect, multiple-lens, catheterizing cystoscope was made by Kny-Scheerer, of New York, for Frederick Bierhoff, of New York, in 1902,² the year of the inception of the American Urological Association. After F. Tilden Brown made several modifications in his ureteral catheterizing instrument, Dr. Leo Buerger, of New York, made other changes and came up with the Brown Buerger Combination Cystoscope in 1908. This became the standard cystoscope for American urologists for many years thereafter and simplified ureteral catheterization.

In passing, it should be noted that two other inventions during the last decade of the 19th Century were paramount in making ureteral catheterization practical. In 1898, W.C. Preston of Electro-Surgical Instrument Company of Rochester, New York, made for Dr. Henry Koch a low-amperage "cold" miniature lamp that could be fitted into the beak of a cystoscope.² The other simple invention that revolutionized ureteral catheterization was the Albarran lever, which made guidance of the ureteral catheter more precise. This came in 1897 and was incorporated into a cystoscope by a Cuban-Frenchman, Joaquin Albarran y Dominguez.² The numerous tricks and strange devices introduced to try to isolate the urine from each kidney separately were soon made useless.

One of these tricks had been "fishing" for the ureteral orifice blindly with a metal catheter, guided by a finger in the vagina. A belligerent urologist of Prague by the name of Pawlik gained a reputation for his expertise in this fishing maneuver.² In 1886, he discovered a more precise technique. He found that he could catheterize the female ureter under vision by using a large Simon urethral speculum. He utilized reflected light to view the interior of the water-filled bladder. This became the basis for another bitter urologic controversy.

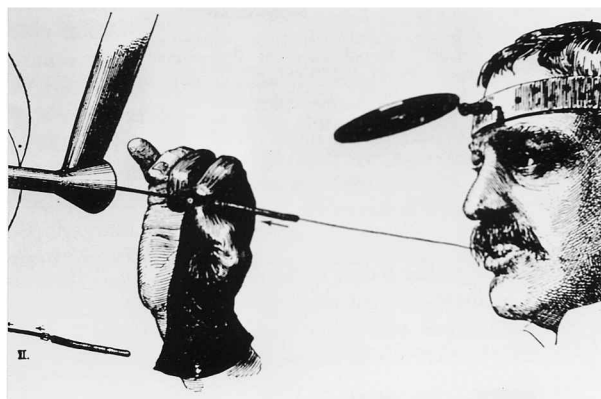


FIG. 2. Howard Kelly doing a ureteral catheterization on a female by aerocystoscopy. (By Max Brödel; copied by Murphy.⁴)

Howard Kelly, of Baltimore, had stumbled on a similar technique.⁴ He had described his “aero-cystoscopic method” in 1883. This resulted from his discovery that the bladder of a woman became filled with air, just as the vagina does, when she is in the knee–chest position if a speculum is introduced into the urethra. By using a head mirror and reflected light, he was able to catheterize the ureters. His elongated cystoscope for use in the male was less successful.

Pawlik accused Kelly of stealing his method by watching his assistant, W. Rubeska, while he was visiting Prague. In 1896, in the *American Journal of Obstetrics*, Dr. Rubeska published an article titled, “A Criticism of Professor Howard Kelly and His Discoveries in the Domain of Urinary Diseases.” In this, he wrote, “. . . One, a Kelly ureteral catheter does not exist. Two, the so-called cystoscopy of Kelly is entirely the discovery and intellectual property of Professor Pawlik.”⁵

The giants in those days “took off their gloves.” Kelly had adequately described a couple of interesting, serendipitous events that led to his discovery of air cystoscopy. He denied all of Pawlik’s assertions. Kelly was a member of the American Urological Association and made many urologic innovations but always considered himself a gynecologist. One of his innovations relating to ureteral catheterization received wide attention. He found that by coating the distal end of a ureteral catheter with wax and passing it up the ureter, he could detect the presence of a calculus by the scratches on the wax.

The most humorous occurrence (with a touch of hubris) told on Kelly and his air cystoscope concerned a prominent lady with bladder problems who was referred to him by William Osler.⁵ Osler had been responsible for getting Kelly to join the staff at the University of Pennsylvania. Later, he took Kelly with him to Johns Hopkins, where he was to become the youngest of the “Big Four.” George Dock, a friend of Kelly’s at Pennsylvania, referred to Kelly as the “Boy Laparotomist.” Osler called him a “young colt.” When Kelly placed the lady in the knee–chest position and introduced his open-tube cystoscope, she coughed and drenched him with urine. He put down his instruments and left the room. He was said to have reported to Osler: “The only thing I know about this lady is that her urine is salty. I can do nothing more for her.”

Max Brödel, the famous medical artist, in Kelly and Burnam’s *Diseases of the Kidneys, Ureters and Bladder* (1914), illustrated in a most amusing manner Kelly’s technique.⁴ He used a stilette in the ureteral catheter, holding the proximal end of the stilette in his teeth. He wore a sterilized glove with only a thumb and two fingers to handle the catheter (Fig. 2).

Another memorable event in the lore of ureteral catheterization involved Kelly and his colleague Hugh Young. Young re-

counts it in *A Surgeon’s Autobiography*.³ A ureteral catheterization contest between the two of them was staged for the American Surgical Society meeting at Johns Hopkins. Kelly’s lady, fully anesthetized in the knee–chest position, was wheeled in. Kelly effortlessly passed two ureteral catheters while the stop-watch-holding audience applauded. Young’s patient, a wide-awake man, then was brought in. The nervous professor was equally nimble in introducing two ureteral catheters using Casper’s double-catheterizing cystoscope. Young said they each took 2 or 3 minutes, but no winner was announced. He failed to answer a question as to whether anyone had checked to see whether the catheters were indeed in the ureters.

TODAY: ON THE SHOULDERS OF GIANTS

Ureteral catheterization and instrumentation, including fiberoptic visualization, have become so routine that those doing the procedures seldom pause to think of how many hardy pioneers and how much animosity might have been involved in making this possible. I have touched on only the highlights of a long, interesting journey involving many individuals: physicians and long-suffering patients. Many important men and maneuvers have been passed over in this narration.

REFERENCES

1. Reuter MA, Reuter HJ, Engel RM. *History of Endoscopy*, vol 1–4. Stuttgart, 1997.
2. Landes RR, Bush RB, Zorngniotti AW. *Perspectives in Urology*, vol. 1. Roche Laboratories, 1976.
3. Young HH. *A Surgeon’s Autobiography*. New York: Harcourt, Brace, 1940.
4. Murphy JC. *The History of Urology*. Springfield, IL: Charles C Thomas, 1972.
5. Eaton Laboratories. *A Bicentennial History of the Practice of Urology in the United States*, 1976.
6. Chesney AM. *The Johns Hopkins Hospital and the Johns Hopkins University School of Medicine*, vol. 1. Baltimore: Johns Hopkins Press, 1943.

Address reprint requests to:
Earl F. Nation, M.D.
311 E. Sierra Madre Blvd No. E
Sierra Madre, CA 91024

E-mail: enoit@gte.net