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# LEGENDS IN UROLOGY

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At the American Urological Association (AUA) meeting this year, I was honored to receive the Lifetime Achievement Award and a flattering invitation to contribute to this “Legends in Urology” series. I listened to the accolades from the President of the AUA, as he enumerated how I had developed a subspecialty of urology, formed an international society and founded a journal, and many thoughts flashed through my mind. I could not help thinking that I had been at the right place at the right time to embrace the opportunities to achieve those goals. Moreover, I was fortunate to inter-relate with an outstanding group of colleagues. Collectively, we stimulated each other to develop new techniques and instruments that to a large extent displaced the techniques and instruments with which we were trained.

## **Early years in the new field**

I emigrated from South Africa to the United States in 1977 and was appointed to the staff of the Veterans Administration (as it was then called) Hospital in Minneapolis. One of my first patients had an obstruction of one ureter from cancer of the prostate gland. I elected to re-implant his ureter. A few days postoperatively, he developed a leak from his anastomotic site. Unfortunately, this persisted, and I decided to stent the anastomosis. I could not advance the stent in the usual retrograde manner because of the position of the uretero-cystostomy, so I conceived a plan to pull the stent through the ureter. This involved performing a percutaneous nephrostomy, advancing a catheter down the ureter, grasping the end of that catheter cystoscopically, and then attaching a series of catheters that would allow me to place a Gibbons’ stent in the optimal position. This worked very effectively, and in order to explain the technique at our complications conference, I asked the VA Hospital artist to draw a series of pictures to depict the steps in the procedure. The pictures were outstanding and I published them. That was the first paper in endourology, although we did not know it at the time.

This concept of advancing a catheter down the ureter from a percutaneous nephrostomy intrigued me, and I started applying it to other situations. For example, if one attached a stone basket to the catheter, one could capture a stone or even multiple stones because it was guaranteed that the basket could always be moved around appropriately in the ureter. In those days, we did not have ureteroscopes. Other applications were facilitating a ureteral meatotomy and extracting stones from the ureter in a patient with an ileal conduit. The nephrostomy tract became a highway to the interior of the kidney.

## **Endourology becomes a new Specialty**

While I was at the VA Hospital, I was fortunate to work with a very talented radiologist, Dr. Bob Miller, a pioneer of another new specialty, interventional radiology. He could always position a catheter exactly where I wanted it to be located. The hospital had several paraplegic and quadraplegic patients who had indwelling nephrostomy tubes that often became dislodged or occluded. A logical solution was the insertion of circle-tube nephrostomies. This involved making a second nephrostomy puncture, inserting a guide-wire and then retrieving its end through the original nephrostomy site. With Bob’s assistance, we were able to grasp the end of the guide-wire with a stone basket, and thereafter, we merely dilated the tract and inserted the circle tube.

The next application of the nephrostomy tract was the attempt to dissolve stones by chemolysis. The installation of acetylcysteine together with sodium bicarbonate was highly effective for ridding patients of cystine stones.

I then used Renacidin to dissolve struvite stones. This was certainly less dramatic because it took a long time, but in those days, the veterans were happy to stay in the hospital and have three good meals a day. It took about 3-4 weeks of continuous irrigation to dissolve a stone.....not very cost effective!

While I was at the VA Hospital, I collaborated with an outstanding resident, Dr. Ralph Clayman, and that collaboration continues to this day, even as he has ascended to the position of medical school dean. At the time, he would allow me to work on only some of the stone patients; he hid the other patients from me because he wanted to do open surgery on them!! He later changed direction, becoming one of the leading developers and exponents of minimally invasive urology.

### **A name for the new specialty**

The VA Hospital was associated with the University of Minnesota Medical School, and at that time the chairman of the urology department was Dr. Elwin E. Fraley. He suggested that we use a descriptive term to embrace this developing field of urology. I selected the name "ENDO-UROLOGY" from the various names that he proposed, as I felt that this quite accurately described the procedures that we were performing. I then defined "Endo-Urology" as "closed manipulation of the genito-urinary tract". This resulted in a poster presentation at the 1978 AUA meeting entitled "Endourology," which my residents privately retitled "End-of-Urology." Their humor was aimed at what they saw as a progressive decrease in the numbers of open surgery procedures!

### **New adventures at the University of Minnesota**

I transferred from the VA Hospital to the University of Minnesota Hospital, where I worked closely with Drs. Willie Castaneda and Kurt Amplatz. The former is the Editor-in-Chief of the leading text in interventional radiology and co-author of my first book on Endo-Urology. Subsequently, I published *Smith's Textbook of Endourology*, and the third edition will be out shortly.

It soon became routine for us to insert a nephrostomy tube in anyone who presented with obstruction of the upper tract, which avoided the bleeding complications and morbidity associated with operating on uremic patients. When I presented these data at a meeting of the Minnesota Urological Society, these concepts were not well-received and the consensus seemed to be that I was apprehensive about operating!!

Kurt Amplatz had an excellent technician in his laboratory, and if one wanted a particular instrument, he would create it by the next day. We thought it would be a good idea to dilate a nephrostomy tract rapidly and then remove a stone or flush it out. The first Amplatz dilators were cylinders with a flush end, but we found that if the kidney was irrigated with those Amplatz sheaths, the pelvic mucosa adhered to the end of the sheath and from then on, the sheaths were cut obliquely to allow irrigation. However, irrigation in itself was a bad idea because it could give rise to gram-negative septicemia. I thought the concept of rapid dilation of the nephrostomy tract was a monumental break-through, but the paper we submitted was rejected by several journals.

### **Move to the East**

In 1982, I became the Chairman of the Urology Department at Long Island Jewish Medical Center in New York and shortly thereafter edited an issue of the *Urologic Clinics of North America* which was devoted to endourology. In the same year, John Wickham organized the 1<sup>st</sup> World Congress of Endourology in London. Ralph Clayman had recently returned to the University of Minnesota as a faculty member, having done a fellowship in Texas, and he organized the 1<sup>st</sup> Hands-on Course in Endourology. He came up with the concept of using a pig kidney to teach participants to perform nephrostomies, dilate the tracts, and remove stones. These two efforts launched an era of courses both at the University of Minnesota and Long Island Jewish Medical Center, which drew large numbers of urologists who were eager to learn these procedures.

Subsequently, Drs. Joe Segura, Ralph Clayman, Gopal Badlani, and I formed the "Endourology Society" and held the first World Congress of Endourology in New York City. The financial responsibility of hosting this meeting

was onerous, and we were worried that if it did not attract the requisite attendance or company support, we would have to suffer the losses. Fortunately, Gopal Badlani was able to make it economically viable, and this allowed us to expand the role of the Society. We established fellowships with definite requirements, held annual World Congresses, and, as societies are prone to do, produced a journal.

The journal was definitely not our idea. When Mary Ann Liebert, the highly successful medical and scientific publisher, asked me to start an endo-urology journal for the Society, I tried to demur, because, as I said to her, there were already too many journals. As I soon discovered, Mary Ann does not understand the word “no”. I then said that I would edit the journal only if Ralph Clayman, who I knew agreed with me that the world did not need another urology journal, was the coeditor. He too said “no” to Mary Ann, and we thought that we had surely killed the project, but clearly we had underestimated her determination. A few days later, Ralph called to inform me that she had called him again and we were now coeditors of the *Journal of Endourology*!

Our “unnecessary” journal started out as a quarterly, but there soon were so many excellent submissions that Liebert increased the frequency of publication, first to six times a year and now monthly, and each issue is fat with invaluable material. The journal is distributed to thousands of urologists, and most residents in Canada, the USA, Europe, and now many parts of Asia and South America get a free copy. Its website posts videos so that subscribers can view an operative procedure on the Internet at home or even in the operating room. Some issues devoted entirely to techniques have been mailed with CD-ROMs on which those techniques are illustrated with videos. The titles and abstracts of all the papers are translated into 10 languages, making it a truly international journal. This has become necessary, as many countries have formed endourology societies that are affiliated with the original society.

The Society now is stronger than ever, with Steve Nakada as secretary, John Denstedt as Treasurer, and Ralph Clayman as President. We all hope it will continue to evolve successfully. It already has given rise to several sections or subsocieties, many of which have separate meetings. These include the Society for Urology and Engineering, The Robotic Group, The Focal Therapy Group, and Videourology. I was fortunate to be President of the Society for 25 years, with Joe Segura as Vice-President, Gopal Badlani as Treasurer, and Ralph Clayman as Secretary.

I have always believed it is my duty, as part of training the next generation, to stimulate my residents and fellows to publish, because publishing makes one aware of what has been done previously and encourages one to think deeply about one’s own findings and what it means. For this reason, I have usually made them the first author in most of the 550 papers and chapters that I have published, as well as in the 150 videos. Five years ago, Lou Kavoussi was appointed Chairman. Not only did he encourage me to continue to work full-time in the department, but he named the department “The Arthur Smith Institute of Urology” and I will always be indebted to him.

As I look back at the development and continuing evolution of endo-urology, I have come to realize that what made it possible was that the thinking of the founders of the endo-urology society meshed so well. We looked at a clinical problem and asked “Do you suppose.....?” “What if.....?” and “Could we.....?” and kept working at it until we had good answers. We also benefited immeasurably from the creativity of many people we never met: the brilliant engineers who created the high-resolution imaging equipment, the increasingly capable endoscopes, and the many devices: catheters, stone baskets, guide-wires, and stents. Often, so prolific were the ideas that an instrument would become obsolete soon after it was produced, as someone came up with a better idea. As a result of this wide collaboration, our specialty was transformed. All these developments have vastly improved the care of patients with urological problems. And that, not the applause and awards (welcome and satisfying as they are), was always the goal of our work.

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