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Epochs in Endourology

Hans Joachim Reuter: The Urologic Endoscopist, Photographer, and Historian

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HANS JOACHIM REUTER was born in October 1923 in a small village in the rural countryside about an hour by train from the next town (Fig. 1). His father was a family physician who gave up his career as a surgeon for the sake of his family. Life was difficult after the Great Depression, during which the family had lost all its wealth. After the beginning of the World War II, at age 17, he graduated early from the German school comparable to college because of war recruiting. After being wounded in Russia, he was able to initiate his medical career during convalescence, but when he went to war again, he was taken prisoner in Russia. From there, he escaped, and after convalescence, he finished his medical studies in Heidelberg.

After internships in different fields, including gynecology, Dr. Reuter specialized in urology in Ulm, which features the largest of three endoscopic centers in Germany at that time, having approximately 300 beds. Endoscopic techniques, mainly cystoscopy and transurethral resection of the prostate and bladder, had to be learned by "stealing the teacher's movements with the eyes," as his mentor Max Hösel used to say. At that time, teaching attachments were clumsy and rare, and television could only by dreamed of.

Having finished specialty training, he started operative urology in Stuttgart with 12 beds. There were only 42 urologic beds in all of Stuttgart, a city of 650,000 people, whereas today, there are 150 beds for the same population. In the time of the "Wirtschaftswunder," the miraculous postwar economic evolution of Germany, he was able to transfer his clinic and build a hospital for 45 urologic beds (Fig. 2). His wife Waltruat, the manager-in-chief, gave the establishment a human touch. It was said to be *the* up-to-date hospital at that time in Stuttgart, as it was well organized and cooperating with seven other urologists of Stuttgart. This enabled creative work documented by endoscopic photography and cinematography from the beginning.

Dr. Reuter was inspired by his assistants A. Frei and H. Schubert in Ulm, who started experimenting with endophotography in 1952. Reuter's first publication of endoscopic pictures appeared in 1960. Specially designed endoscopes were necessary. They were equipped with high-quality telescopes and light bulbs, which provided sufficient light by increasing the voltage by four times—from 6 V to 24 V—for the time of the exposure of the picture. Between 1959 and 1967, he designed several photocystoscopes. A trocarcystoscope for additional suprapubic access was also created.

The standard film material was Kodak Ektachrome high speed with a sensitivity of 200 ASA. Reuter limited the diameter of the picture on the slide film to 10 mm to obtain a higher shutter speed. He thus prevented blurring of the picture outlines by the motion of the hand. The standard photocamera was the Leica body, the legendary M3 model with a mirror adapter and a special endoscopic lens by the R. Wolf Company. With the introduction of the electronic flash in 1960 in France and 1961 in Germany, larger pictures with the full width of the 24-mm film could be exposed. He made pictures with camera bodies from Robot, Kodak, and others; however, the Leica made the best pictures until Olympus cameras enabled TTL (through the lens measurement of exposure data).

The first operation movies were captured with an 8-mm film camera from the Bauer Company. His best films were made with a Bolex 16-mm film camera. They all were powered by a spring drive that was charged manually. The heavy camera was attached to the endoscope directly, and it was hard work to film a TURP by carrying the camera and operating the resectoscope simultaneously.

After several publications with black and white and color photographs beginning in 1960, Reuter published a photographic atlas of urologic endoscopy in 1963 with Thieme Verlag in Germany[1] and in 1964 with W. B. Saunders Company, Philadelphia,[2] the first one of its kind for urology that was eventually published in four languages. It displayed 179 mostly color photographs. It was completed by a second volume when the second edition was published in 1980. Translations into seven languages, including Chinese, followed from 1984 onward. This

Museum für Medizinische Endoskopie, Max Nitze e. V., and Reuter Klinik Urologie, Stuttgart, Germany

FIG. 1. Portrait of Hans Joachim Reuter in May 2000.

work was supplemented by 200 scientific publications and 19 endoscopic videos.

In 1968, Reuter started cryosurgery of the prostate for high-risk patients and developed tools for prevention of damage to the ureteral orifices, urinary sphincter, and rectum. Suprapubic trocarcystoscopy provided endoscopic control of the ice infiltration, and rectal needle measurement helped to protect rectum and sphincter. He also collaborated in studies of complementary immune reactions.

Reuter was critically involved in the development and clinical application of electrohydraulic lithotripsy initiated by Victor Goldberg in Riga, Lithuania.[3] He brought the first lithotripter from Riga to Europe and improved the probes. He also created new instruments; e.g., the Lithoclast for application in bladder and ureter, which he designed in collaboration with the Wolf Company.[4]

In 1973, he designed the first return-flow resectoscope with the Storz Company. It had two concentric tubes, which separated inflow through the inner shaft and outflow through the outer shaft, with inlets laterally at the tip of the shaft. This design distinguished his instrument from the precursors designed by Max Nitze, Joseph McCarthy, and José Iglesias, who placed a small tube inside next to the telescope for suction. The instrument was demonstrated to Iglesias during his visit to Stuttgart in 1973. Iglesias combined it with his working element and published it in 1975.[5]

Ureterorenoscopy was brought to Stuttgart in 1980 by Reuter's student Enrique Perez-Castro from Madrid, Spain.[6] He designed the first ureterorenoscope with the Storz Company. The presentations of this procedure by Enrique Perez-Castro and Matthias Reuter in 1981 at the Congress of the Germany Urological Association were acknowledged with sneers by many leading German endoscopists. In 1983, Reuter published a compact ureterorenoscope with a 9.5F diameter and a 5F operating channel.[7] The operating ureterorenoscope with oblique optics, which he developed with the Wolf Company, was given to Karlhorst Bichler from the University of Tubingen, Germany for exploration. Bichler later published about it.

Reuter's most important invention was the suprapubic self-cleaning trocar drainage and low-pressure irrigation system, created in 1962 and later supplemented with a pressure gauge (Fig. 3). This system realized several features important for the safety of TUR of the prostate.[8] With these tools, he was able to carry out TUR of prostate cancer beyond the prostatic capsule. The most important precaution, besides quick and effective coagulation, was low static and dynamic pressure to prevent perivesical tissue from breaking up and the venous sinuses from absorbing irrigant solution. After publication of his first series in 1980 with the second edition of the atlas, other centers tried TUR of prostate cancer. However, they had a high incidence of disseminated metastases 6 months after TUR, which was attributable to insufficient realization of low pressure. Most importantly, they failed to set the irrigant reservoir lower than 30 cm above the symphysis, a crucial detail still not often observed today.

After he retired from operating, Reuter started working up his ample collection of historical instruments, which he had started in the 1960s. In 1984, he had founded the Max Nitze Museum for Medical Endoscopy and had since organized several meetings with leading urologists from all over the world. Eventually, the collection was too big to be displayed in a private apartment. After a difficult search for an adequate location for a permanent exhibition, it was transferred to the Josephinum, the Institute of Medical History at the University of Vienna. The Nitze-Leiter Museum is stationed in two well-equipped rooms and offers an excellent display of historic endoscopes.

FIG. 2. Reuter's hospital in Stuttgart.

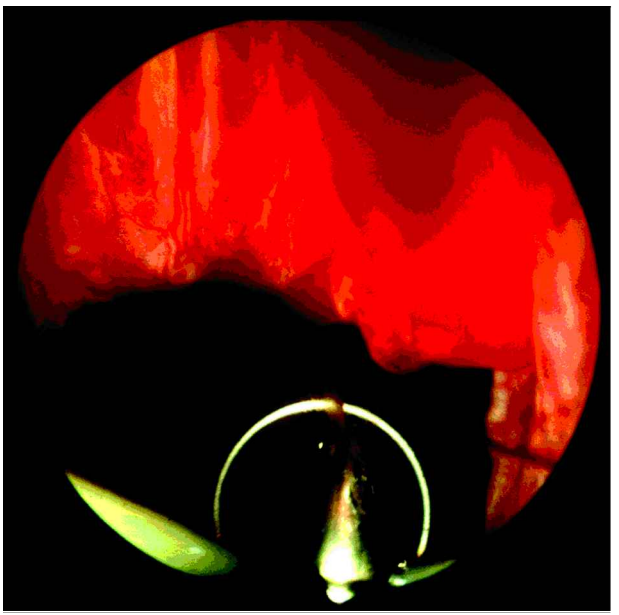

FIG. 3. Endoscopic photography of low-pressure TURP.

During this period of about 10 years, Hans Reuter and his son Matthias collected the data from the ample scientific library of the Max Nitze Museum and depictions of the instruments for a textbook and atlas of the History of Endoscopy.[9] The first four volumes were published as hardbacks and on CD-ROM in 1998–1999. Volumes 5 through 7 are currently in print. Throughout the work on the encyclopedia, he created artistic impressions of medical diaagnostic images, the human being, and nature at his personal computer.

At its Annual Meeting in Atlanta 2000, he work and donations were recognized by the American Urological Association by an official invitation and certificate.

His life was punctuated by several injuries during World War II and several severe illnesses, which he survived with his iron will. Eventually, after a short but grave affliction, he died in peace on the 18th of April 2003 at the age of 79 with his wife Waltraut at his side and surrounded by his family of two sons, two daughters, and thirteen grandchildren.

An appropriate characterization of Hans Reuter was given recently by Rainer Engel, who wrote: "I was impressed by the fearless sincerity and frankness, which brought Hans into conflict with his colleagues. A personality like him expressing his unmasked opinion is rare in these days, when everyone wants to be politically correct. This always has well impressed me."

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