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Roger W. Barnes – Pious Pioneer of Urology

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Introduction: Roger W. Barnes (RWB) (1897-1982) was one of the most influential urologists of the 20th century. His life and legacy is honored through his enduring scientific contributions and his global humanitarian impact. Our objective was to explore unpublished and primary data to better understand Barnes' medical and social contributions and place his long lived impact into perspective.

Sources and Methods: We reviewed personal files on RWB, his published papers and books, and newspapers and archival information at the Heritage Research Center, Loma Linda, CA.

Results: Barnes was an innovative urologist, prolific author, and teacher. He pioneered endoscopic surgery, most noted for transurethral resection of the enlarged prostate, conservative treatment of carcinoma of the prostate, and transurethral resection as primary surgical treatment of bladder tumors. As a Seventh Day Adventist, he dedicated himself to in sharing his knowledge and skill, leading to multiple medical missions on six continents to teach urology and establish still thriving departments and clinics.

Conclusions: RW Barnes lived a life of "self discipline, motivated by a concern for others…" He achieved that with skill and grace, an aspirational goal for urologists everywhere.

Key Words: Roger W. Barnes, endoscopy, medical missions

In my (HH) first year of medical school, Spring 1966, I noticed a flyer on the bulletin board for a summer clerkship with a urologist in Los Angeles, named Roger W Barnes. Although I didn't know anything about urology, I jumped at the opportunity because, beside receiving education, a modest stipend was offered to also work as a physician assistant and technologist. I spent that summer with Barnes and his son-in-law partner, Henry L. Hadley, unaware at the time that Barnes was Chair of Urology at the College of Medical Evangelists (now part of Loma Linda University)(CME/LLU), and widely regarded as a 'giant' in urology. I came to appreciate only years later during my training why he deserved that distinction. To my good forture, the clerkship proved to be a transformative experience, inspiring a future career path in urology (Figure 1).

Under Barnes' pedagogical scrutiny, my job was to obtain histories and perform urologic exams, draw blood and collect urine for analysis, inject contrast and take x-rays for intravenous pyelograms (including developing the films), position and prep patients on the table for a cystoscopy, and arrange, in perfect order, required surgical instruments. On occasion, we made rounds with the residents at the nearby White Memorial Hospital, where Barnes conducted the majority of his operations (Figure 2). After some time observing him, Barnes taught me how to insert the rigid Brown-Buerger cystoscope into the bladder and begin cystoscopy before he arrived, completed his own exam, and pointed out the findings I had missed. Cystoscopy then was a tedious task since there was only one eyepiece without today's fiber optics and video-camera. The bladder was illuminated only by a single incandescent bulb screwed into the end of the scope. Regardless, Barnes' teaching was succinct. One day, an elderly gentleman, limping into the clinic with a cane, complained of frequent urination. We performed a comprehensive exam and I asked Barnes for his differential diagnosis. He answered, simply, "stroke" and the connection between neurological diseases and voiding dysfunction became indelibly fixed in my mind.

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RW Barnes was always moving, running to see as many patients as he could during a long day. A colleague remarked, "a man most envied by weight watchers… is one who is so busy helping others that weight can't seem to catch up with him. This is Roger W. Barnes, MD." (1). Yet, with each patient, Barnes was kind, patient, and soft-spoken. He listened to his patients (a lesson I never forgot). Widely known as a healer, teacher, author, and scholar, Barnes is better known for his "sterling qualities of friendship and his willingness to serve in whatever capacity for his fellowmen."(1) All who knew him wanted to be, as was echoed by his grandson, Roger Hadley, "like grandpa Barnes." This manuscript's authors, both urologists 'standing on Dr. Barnes' shoulders', wish to honor the legacy of this remarkable man, focusing on his scientific contributions to urology, his global medical missions, and his humanitarian gifts. Barnes' philosophy was simple: "Self-discipline motivated by concern for others. (This) has been the standard of conduct which I have attempted to reach."(2) He achieved that, and much more.

SOURCES AND METHODS

We reviewed the authors' personal files (HH and HRH), and the Department of Archives and Special Collections, Heritage Research Center (Loma Linda University) containing the Barnes, Roger William, and Oca Davis biography file. We accessed the Adventist Review and Loma Linda/CME alumni journal, American Urological Association (AUA) Times , and RW Barnes' publications listed in PubMed.

RESULTS

Background synopsis

Roger William Barnes was born in Littelton, Colorado, in 1897. At age 11, he moved with his parents to northern California where, raised as a devout Seventh Day Adventist, he was educated at the faith-based Lodi Academy and Pacific Union College. He received his MD degree from the College of Medical Evangelists in Los Angeles, class of 1922. He was an excellent student, inducted into Alpha Omega Alpha and Kappa Phi Kappa honor societies. He completed an internship and residency in urology at the Los Angeles County Hospital in 1925. In the same year, he accepted an appointment to the faculty of CME/LLU, where he would remain for 57 years, serving as the first Chair of Urology from 1932 to 1967. He married Oca Davis in 1923 and the couple raised six children.(3)

Dr. Barnes was 'Mr. Urology', best known for

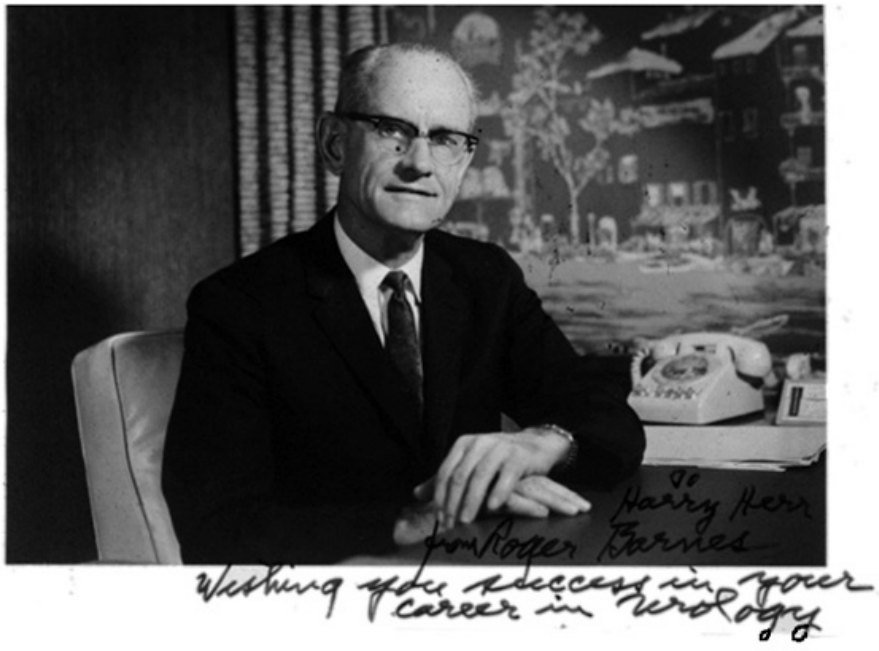

Figure 1. Roger W. Barnes (1897-1982), prolific author, teacher, and humanitarian. (Personal collection, to author, HH)

Figure 2. (Left) Aerial view of White Memorial Hospital complex and College of Medical Evangelists, Los Angeles campus, 1960. (Department of Archives and Special Collections, University Libraries, Loma Linda University). (Right) RW Barnes receives the AUA's Ramon Guiteras Award from AUA President, John Lattimer, 1979. (Didusch Museum, Linthicum, Md)

pioneering, mastering, and teaching endoscopic surgery. He developed the "Barnes adjustable stool", of which he was very proud. With his wife, Oca, he organized teaching programs in urology throughout the world. He also served three two-month tours on the medical ship S.S. Hope in Ecuador, Peru, and Ceylon (Sri Lanka). Dr. Barnes received numerous honors for his achievements, including the American Urological Association's (AUA) highest award, the Ramon Guiteras Award, in 1979 (Figure 2). "In all this", a colleague noted, "he remained a humble, contrite Christian, a devoted husband and father, and a respected teacher."(3)

Dr. Barnes knew that sometmes "medical science is not enough," illustrated by an experience he had with a patient (4).

> "When a person has had a heart attack, the extra stress caused by anxiety and fear as to the possible outcome can cause the patient to die. Therefore, the composure that can come from a patient's placing his faith in the 'Great Physician' may be the determining factor in his recovery. When the patient knows that the physician at his bedside is in contact with God, his confidence in both is strengthened, his fear is changed to hope, and his anxiety gives way to peace." (5)

In 1972, at the age of 75, Barnes moved to Loma Linda when the medical school relocated and established a new residency program. He continued with his teaching and his urologic practice. Dr. Barnes' residents have since served in 14 countries on every continent except Antarctica. He remained active until a brief illness led to his death from leukemia in 1982 at the age of 84.(6) During his final days, his only concern was for others including the nurses taking care of him.(7) The Roger W. Barnes Medical Research Fund was established in his honor to support clinical and basic science research.

Scientific Contributions

RW Barnes was a prolific author and scholar. He published over 150 scientific papers (22 papers published after the age of 75) and three textbooks, including the classic *Endoscopic Prostatic Surgery* (1943), and *Urological Practice* (1954), a treatise for medical students and general physicians. Between 1927 and 1959, he published single-author papers in *California Western Medicine* on such diverse subjects as urography,

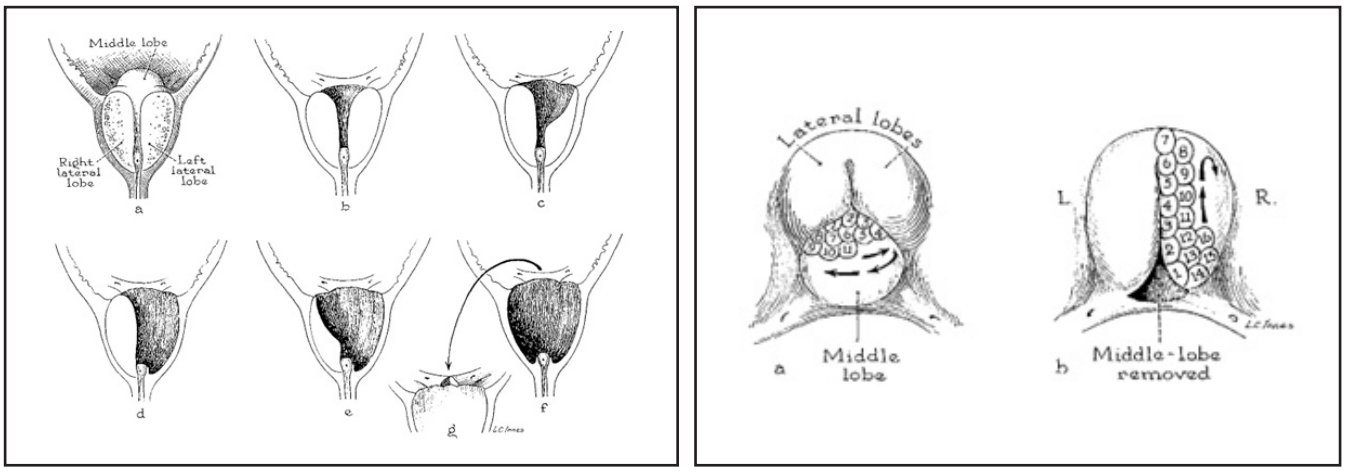

Figure 3. (Letf) The 'Barnes TURP technique' starts with resection of the middle lobe at 6 o'clock all the way to the verumontanum. This creates a nice trough in the floor of the prostatic urethra. Once this has been done the right and left lobes are then dealt with separately but one at a time. (10). (Right) "Transvesical view of prostate being resected showing sequence for removal of tissue."(10)

carcinoma of the prostate, lithalopaxy vs. cystolithotomy, diet, bladder neck contracture, interstitial cystitis and non-specific urethritis in females, intestino-vesical fistula, bladder involvement in spinal cord lesions, and the undescended testis.(8) RW Barnes is best known for his technical description of transurethral resection of the prostate (TURP), conservative treatment of carcinoma of the prostate, and transurethral resection of bladder tumors (TURB). Throughout his writings, he emphasized meticulous surgical technique and the components of successful urologic surgery being a correct diagnosis, expert pre- and post-operative care, superb surgical judgment, and excellent surgical technique. Barnes always espoused that the surgeon who excels in each of these is the one who obtains the best results.(9)

Transurethral Resection of the Prostate (TURP)

TURP was introduced by Maximillan Stern in 1926, but it was RW Barnes who pioneered and popularized TURP throughout the world. He performed more than 18,000 procedures, including large glands up to 295 grams. Using his preferred Stern-McCarthy resectoscope (rather than the cold punch approach), he described his technique in exquisite detail, emphasizing the "endoscopic surgeon must develop coordination of movements and rhythm of motion to remove prostates rapidly"(Figure 3).(10) His description, while mirroring our common approach now, was innovative then: the intravesical lobe is first resected down to bladder neck fibers, followed by resection of the lateral lobes down to the prostatic capsule. Dr. Barnes cut rapidly, not stopping to control bleeding until each lobe had been completely removed, exposing the major vessels for fulguration. In one report, up to 81% of his TURPs were completed in under one hour, and only 7% of patients required transfusion. In 1000 consecutive cases, Barnes and colleagues reported relief of obstructive symptoms in 87%, a mortality rate of 1.8%, and any complication requiring treatment in 3.3%.(11) TURP remains the gold standard surgical treatment of BPH today.

Carcinoma of the prostate

Dr. Barnes was an advocate for conservative therapy of prostate cancer. In a series of patients who were suitable candidates (e.g. had localized disease) for total prostatectomy, he used TURP and endocrine therapy (orchiectomy or estrogen), reporting 10- and 15-year survival rates of 57% and 33%, respectively, similar at the time to those of radical prostatectomy, with far fewer adverse consequences.(12,13) He did limit recommendations for patients with fewer than 10 years life expectancy and emphasized (ahead of his time) that since many men may live 10 years without any treatment, 15-year follow-up is required to best judge efficacy of treatments.(14)

Transurethral resection of bladder tumors (TURB)

Barnes treated 81% of patients with bladder tumors with endoscopic surgery, including invasive tumors up to 8 cm in size.(15) He selected patients with tumors he deemed confined to the bladder wall. With TURBT, 53% of his patients survived 5 years compared at the

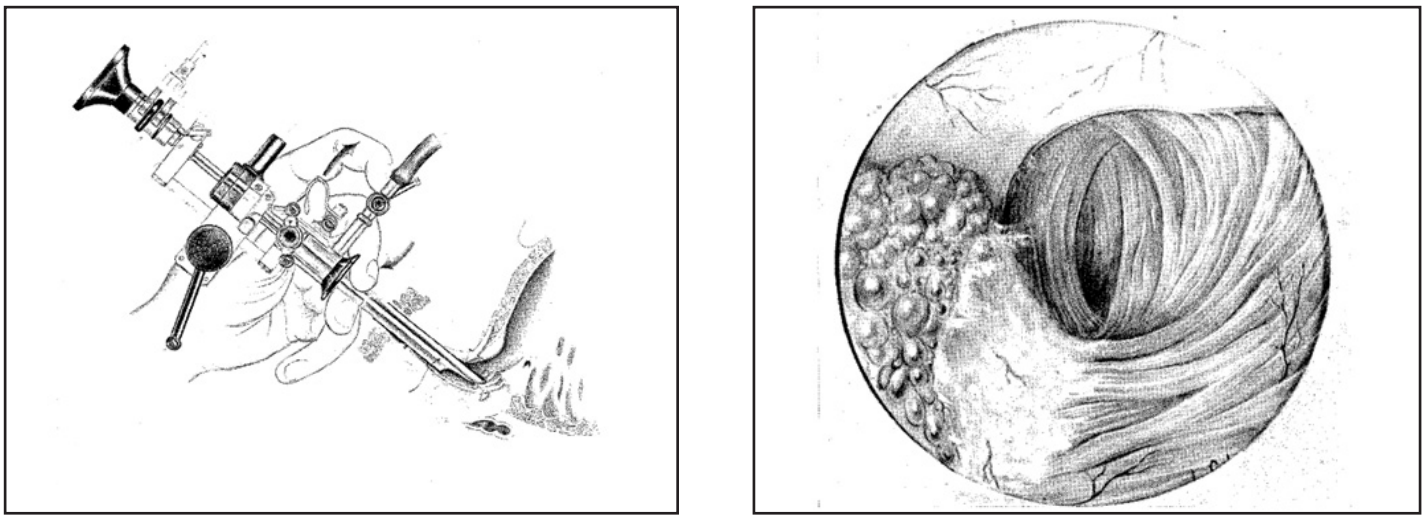

Figure 5. (Left) Dr. Barnes shows the position of hand and fingers on the Stern-McCarthy resectoscope and movement of the instrument during removal of obstructing prostate tissue.(10) "Leverage pressure of inner end of sheath against tissue to be removed. Arrows indicate direction of pressure while pieve of tissue is being resected."(10) (Right) Wide and deep transurethral resection of a bladder tumor.(16) "Partially resected bladder tumor shows different appearance of tumor tissue and bladder muscle."(16)

time to a survival rate of only 20% after radical cystectomy. (16) To achieve such results, his resection would have had to be wide and deep into clearly visible muscle. He once wrote that TURBT would proceed beyond "removing all tumor tissue and to continue resecting for approximately 1 cm deep to the tumor and on all sides lateral to the tumor. This is done even though the resection is continued entirely through the bladder wall"(Figure 5). (17) TURBT was followed with cystoscopy after 3 months to verify complete resection. Small recurrent bladder tumors were electro-fulgurated in the office. He emphasized that local stage as well as competence and experience of the urological surgeon were significant factors determining outcomes (18). Tumor staging was estimated from gross appearance of tissues at the time of resection, the extent of a complete visible resection, and the pathology report on grade, but not on stage, maintaining that the the urologist determined the tumor stage not the pathologist. I continue to rely today on Barnes' principles regarding endoscopic evaluation and treatment of bladder tumors.

Open Surgery

Barnes performed complex, open surgery, when appropriate, including uretero-and cystolithotomy, repair of injuries to the urinary tract, nephrectomy, cystectomy, urinary diversion through an isolated rectal pouch, plastic reconstruction of the penis after traumatic amputation, reconstruction of the urethra with a bladder flap, and repair of vesicovaginal fistulas.(19-22) He also published a classification of uremia and its causes for physicians, where his encyclopedic knowledge of the urologic and medical diseases affecting the kidneys was apparent.(23)

Medical Missionary

Barnes published a remarkable article in *JAMA* in 1958 that "knowledge of urology in this country should be shared with other countries."(24) He not only said urologists should do this, but they were "obligated" to do so. This could be done by training foreign medical graduates in the United States or in their own countries. Barnes did both, spending his vacations and sabbaticals on medical missions (Figure 6). Along with his wife, Oca, he established and organized urology teaching programs and clinics in church-operated mission hospitals located in the Middle East, the Far East, South America, Australia, Southern Asia, and Africa (Figures 7 and 8). In advance of his visits, hospitals arranged to have many patients available for consultation and surgery. He outfitted clinics with personal endoscopes donated from his practice. He performed the first TURP in post-revolution China (c.1970).

In Africa, Adventist hospitals were established in Malawi, Zambia, Botswana, Lasota, South Africa, Kenya, Ruanda, Libya, Ethiopia, and Tanzania. Dr. Barnes purchased a land rover so that he and his wife could travel between hospitals. In South America, he worked in hospitals in Ecuador, Peru, Brazil, Bolivia, and Argentina. In Asia, he worked in Japan,

Figure 6. (Left) Barnes (on the right) searching the globe for his next missionary trip. (Courtesy, Heritage Research Center, Loma Linda University, Los Angeles). (Right) Roger Barnes (right) operating with author Roger Hadley, Saigon, Vietnam, 1974. (Author's personal collections, HRH)

Taiwan, Okinawa, Singapore, Bangkok, and Korea. He taught in New Zealand, Australia, the Philippines, and New Guinea.

The wide variety and unusual nature of disease in Southeast Asia created an ideal setting for Dr. Barnes, whose forte was ingenuity. He managed many patients with urinary calculus disease using a broad spectrum of techniques to remove offending stones. Urethral stones were excised through a perineal urethrostomy, bladder stones with a lithotrite and open cystolithotomy, distal ureteral stones were extracted by blind basketing or, in certain cases, transvaginal distal ureterolithotomy.(25)

Dr. Barnes spent 1956-57 in Vellore, India, where he developed the Department of Urology residency teaching program at the Christian Medical College (Figure 7). During this time, he taught 20 urologists to perform TURPs, contingent on their commitment to teach 20 other urologists throughout the country.(26) Soon thereafter, endoscopic surgery became dispersed throughout Asia, and the Vellore hospital and medical college is still one of the best in India.

Dr. Barnes spent October and November, 1974 operating in Saigon, Vietnam (Figure 6, right). The US Military had granted their main 3rd Field Hospital in Saigon to Loma Linda University to operate as a mission hospital. Barnes was accompanied by his grandson, Roger Hadley, who just graduated from medical school, and was taking a gap year to work in hospitals around the world (above). While in Saigon, Dr. Barnes "did, what he said he had never done before," recalled Hadley, "a procedure in which he inserted a resectoscope through a very mature nephrostomy tract and grabbed a 1-2 cm stone with the resectoscope loop and pulled it out of the kidney.....my first PCNL." (27) On weekends, Barnes would participate in church services and visit orphanages throughout South Vietnam.

CONCLUSION

Dr. Barnes dedicated his professional life to perfecting, performing, and teaching endoscopic surgical treatments of common urologic diseases. Favoring transurethral resection over open surgery, dove-tailed with his conservative philosophy to relieve symptoms and control disease with minimal side effects and burdens of therapy on quality of life. He did not just believe in his approach, by tabulating the long-term outcomes of his patients, he proved that transurethral surgery was certainly comparable, and in many cases, superior to radical open surgery, with fewer adverse consequences. His was a novel approach during the Halstedian era of cancer surgery, where removing whole organs and surrounding structures was justified as the only reliable cure. On the contrary, Barnes showed transurethral resection could manage four-fifths of bladder tumors and provide a comparable alternative (with hormones) to radical prostatectomy for carcinoma

Figure 7. Roger Barnes and wife, Oca, in center of key staff and their families, Christian Medical College, Vellor, India (1956-57). (Author's collection, HRH)

of the prostate. Throughout his writings, however, he emphasized repeatedly that case selection, an experienced surgeon, and meticulous surgical technique were critical to achieving a successful outcome, both in terms of complications and survival. He reported 15 to 20-year follow-up of his patients to truly evaluate survival and consequences of his treatments.

RW Barnes has had a durable global impact on urology, through his scientific contributions and teaching, which have benefitted, and continue to benefit, many patients. Although he focused on their urologic problems, he also attended to patients' overall general and spiritual health. He realized his life long dream to travel the world and serve those who most needed high quality urologic care.

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Figure 8. Four generations of urologists. Roger Barnes with his son-in-law Henry Hadley (back row, middle), grandsons Dean and Roger Hadley (back row, left and right, respectively), and great-grandson David Hadley (on couch, middle) while Zach Hadley (on couch, left) became an orthopedic surgeon. (Author's (HRH) personal collection)