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John Blair Deaver's War on the Prostate

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Introduction: John Blair Deaver was an iconic American surgeon who rose in prominence at the outset of the 20th century when the specialty of urology was in its infancy. By some accounts he was a difficult personality and made an enemy of J. William White, the then Chair of surgery at the University of Pennsylvania. Deaver was also known as a brilliant operative surgeon and educator, performed over 15,000 appendectomies, and invented his eponymous retractor very much in use today. Known more as an abdominal surgeon than a urologist, he still made contributions to the urologic literature and he himself became a revered expert in prostatectomy. We aimed to clarify the contemporary biography of Deaver and his influence in the creation of the modern urologic armamentarium.

Sources and Methods: We used primary source materials from the archives of the University of Pennsylvania, the National Library of Medicine, the Wellcome Fund, the Lancaster County Medical Society, the Medical History Library of the University of Pennsylvania, the Medical Society of the State of New Jersey, the American College of Surgeons, and published literature.

Results: Deaver was a general surgeon and proponent of early appendectomy and "preventative surgery". He devised the retractor that bears his name to allow surgical exposure through small incisions. He was particularly skilled at suprapubic prostatectomy for benign diseases, for the endoscopic management of urethral stricture, and of ureteral stone disease. His Saturday teaching clinics for practicing surgeons became a world-wide phenomenon in his lengthy career. He foresaw the rise of surgical specialists and recognized the need for surgeons of the future to embrace expertise in a precise field. At the same time, he called for increasing communication among medical and surgical fields and a dedication to lifelong excellence. Two quotations credited to Deaver, which encompassed his simple philosophy regarding surgical interventions were "Cut well, get well, stay well" and "Let the patient heal".

Conclusions: Deaver's death in 1931 ended the life of one of surgery's titans, an innovative force in surgical skill and education. His death while undergoing therapeutic radiation serves as an ironic metaphor that those who serve may not reap similar benefits.

Keywords: John B Deaver, Deaver retractor, prostatic surgery,

John Blair Deaver (1855-1931) was an American surgeon at the turn of the 20th century and a product of the highly competitive world of general surgery at the University of Pennsylvania.(1,2) He heralded from a line of physicians and Deaver dedicated his first book to his father Dr. Joshua Deaver, writing that his "character and sterling qualities as a physician have been the guiding influences of my professional life".(3) Deaver graduated from the University of Pennsylvania (Penn) in 1878 but matriculated to Philadephia's German Hospital, in part, due to an apparent personal conflict with the proto-urologist J. William White (1850-1916), the 3rd John Rea Barton Professor at Penn. Deaver wrote a major textbook on genitourinary surgery with the 4th John Rea Barton Professor, Edward Martin (1859-1938).(4)

Deaver may have been regarded as an aggressive surgeon, having been referred to, in at least one biography, as one of "the great slashers" and was reported to have performed on some days more than 25 operations.(5) He was also an educator and held a popular Saturday afternoon clinic that attracted even foreign surgeons to attend. It was following the death of Dr. White that Deaver was called to the Chair of Surgery at the University of Pennsylvania in 1911. Deaver wrote nearly 250 articles and five major textbooks of surgery, was a busy clinician, historian, and an innovator of surgical instrumentation and positioning. By some accounts, however, he had a difficult personality. The details of the confrontation he may have had with White are unknown but they never overcame their mutual animosity towards one another.

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Deaver's clinical work, bridging several specialties from head and neck, abdominal, and urologic surgery, was becoming increasingly rare and yet his attitudes towards specialists may have been more prescient than alleged.(6-8) Deaver's demise at the age of 76 was rumored to be due to prostate cancer yet all medical records of the case were instructed to be destroyed.(4) Thus, there are some paradoxes to Deaver's life and his accomplishments which we wished to clarify. Our objective was to explore his writings, lectures, and accomplishments, in his life and times, to better understand the impact he had on his community and future generations of patients and their surgeons.

SOURCES AND METHODS

We accessed primary and secondary sources on Deaver from the archives of the University of Pennsylvania, the Lancaster City and Council Medical Society, the Medical Society of the State of New Jersey, Deaver's lectures, and his published works including Deaver's 1905 and 1922 editions of *Enlargement of the Prostate: Its History, Anatomy, Etiology, Pathology, Clinical Causes, Symptoms, Diagnosis, Prognosis, Treatment; Technique of Operations, and After-Treatment*.(9-18)

RESULTS

Early Career

John Deaver received his M.D. from the University of Pennsylvania in 1878, became an intern at Germantown Hospital, and thereafter entered private practice. From 1886 he became a surgeon at Lankenau (then German) Hospital where his surgical practice thrived. He was ambidextrous and would routinely perform six major surgeries a day. He was especially known for his appendectomies of which he performed, it was said, greater than 15,000.(19) He once asked of his students "Who does more surgery than John B. Deaver?" "The Mayo brothers," he would answer himself, "because there are two of them."(19) Deaver was a prolific writer and teacher. In 1911, he was called to the University of Pennsylvania as Professor of Surgery after both the 3rd Chair, JW White, died and then his protégé, the 4th Chair, Edward Martin retired. Deaver became the 5th John Rhea Barton Professor of Surgery in 1918 until he retired in 1922. He inspired many students in the medical school, so much so that Penn's John B. Deaver Surgical Society was established in 1897, serving as an honorary organization for students wishing to pursue surgical careers, and was active for 70 years. "Personally," he once wrote, "some of my pleasantest and most satisfying recollections are the hours spent in clinical work among my students. It has been my endeavor to (teach them) the sacredness of their calling and to impress them with the fact that it depends upon them to develop the surgery of the future."(20, p.105)

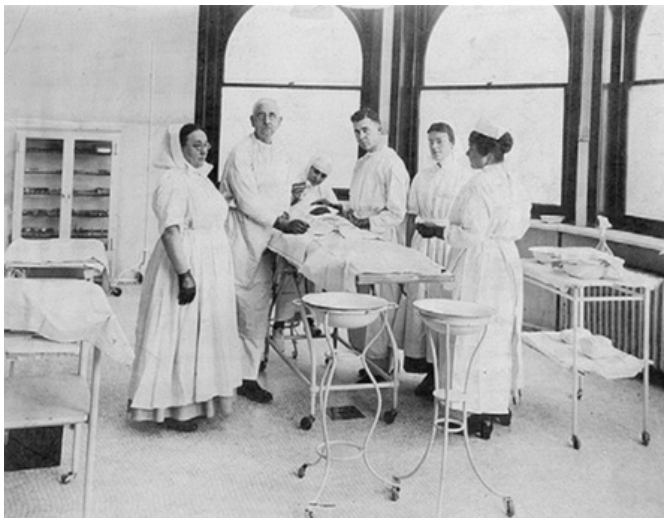

Figure 1. (Left) John Blair Deaver (JBD) (without cap) and his OR staff, at the German (later Lankenau) Hospital, outside Philadelphia, Pennsylvania, c 1900.(Courtesy, University of Pensylvania) (Right) JBD, 1922, as President of the American College of Surgeons, (Image courtesy of the Archives of the American College of Surgeons, Chicago)

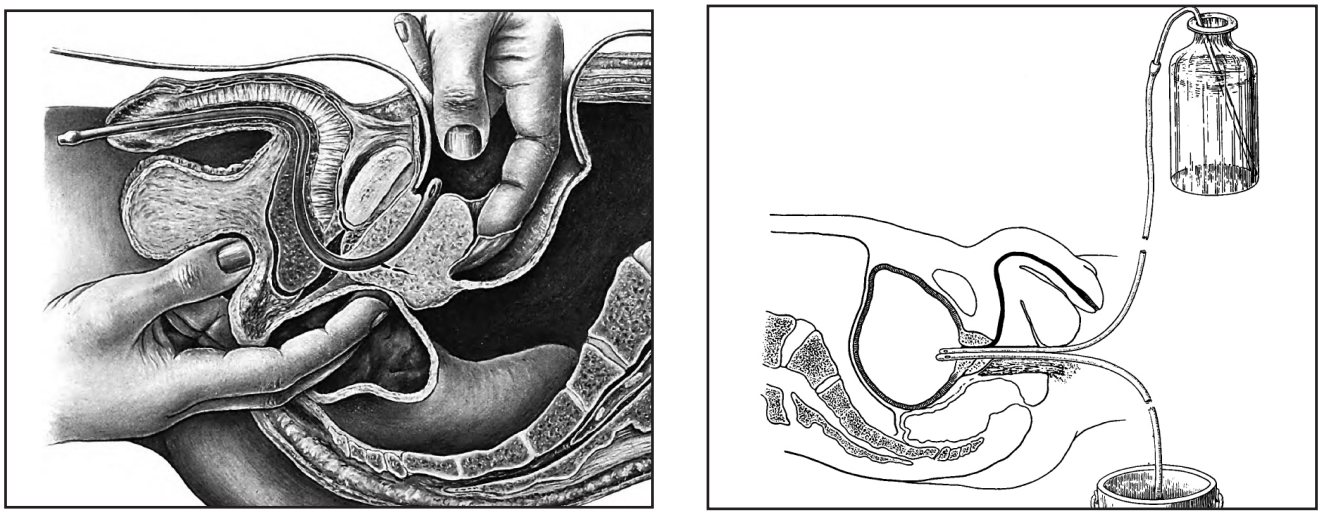

Figure 2. Deaver's illustration of open 'radical' prostatectomy for BPH, after the method of Peter Freyer, whereby transrectal counterpressure facilitated intravesical manipulation. The text specifies that the right hand is gloved. (Right) Deaver's then revolutionary concept of continuous bladder irrigation before the advent of 3-way 'bag', or now known as Foley, catheters.(9)

Deaver and urology

The disorders and diseases of the prostate, particularly benign prostatic hyperplasia (BPH), were as much an issue in Deaver's lifetime as they are still today.(21-23) Deaver lived through the open surgical era when suprapubic and retropubic prostatectomies were in their infancy and the develop of more precision urological tools, such as the Foley catheter, did not yet exist.(24) Deaver once wrote that "it is a remarkable thing that any part of the human body liable to such important pathological changes as the prostate gland should have acquired a conspicuous place in surgery within such comparatively recent years."(9, p.13) He had an acute awareness of the details of urologic history and the discovery of the prostate and the myriad practitioners devoted to its management. "It seems a pity," he once lamented, "that so many controversies in regard to surgical priority are so constantly arising...It appears that prostatic surgery is particularly unfortunate in this respect. (The 17th century surgeon Johannes) Riolaus bitterly denounced his contemporaries for claiming as their own operations which had been employed before their grandfathers were born, and for a hundred years before even that time." (9, p.13)

It is undoubtedly true that the development of urology as a stand-alone subspecialty of surgery certainly occurred during the early half of the twentieth century, just as surgeons had discovered the prostate as noted by Deaver. There are many histories of the development of surgery for both benign and malignant prostate disease, and much activity occurred at the dawn of surgical specialization in the late 1800s. Deaver practiced in Philadelphia just as American urology became formally organized as a separate specialty. The first President of the American Urological Association (AUA), Ramon Guiteras (1858-1917), often spoke of "urology" as a standalone field and that urologists would emerge as a distinct specialty from more general surgeons like John Deaver.(25) Still, Deaver often alluded to the many new technologies available to the budding field, including electricity, and to the need to embrace those procedures that had good results rather than those that appeared to be more novel. Deaver acknowledged some of the great names of early urology as true innovators include Robert Proust (1873-1935) of Paris, Peter Freyer (1851-1921) of the United Kingdom, and Enrico Botini (1837–1903) of Italy.(9) He devoted himself, rather, to suprapubic and perineal prostatectomy and wrote substantially on the safety and merits of proper pre-operative medical preparation and surgical technique. He was not enthusiastic to embrace the untested. "I think that this is the proper place to sound a note of conservatism," he once opined. "Many surgeons are rolling up long lists of successful (or unsuccessful) operations by either the suprapubic or the perineal route. But it appears to me that some such operators maybe a little hasty in resorting to operative interference…One death clearly caused or hastened by an ill-judged resort to operative treatment will demand an immense number of successes to blot out its remembrance. And I cannot but think that some surgeons are displaying more enthusiasm in adding ten

Figure 4. 'Mace Banquet' of the American College of Surgeons, 1921. Deaver, center with glasses and moustache, sits to the left of Charles Mayo (1865-1939) with bow tie and, in the front with handkerchief, WIlliam Mayo (1861-1939). Deaver was said, "Who operates more than John B. Deaver? The Mayo Brothers - because there are of two of them."(19) (Courtesy, Archives of the American College of Surgeons, Chicago)

or twenty operations every year to their tale of cases, than they are in seeking the best interest of their patients."(9, p.204)

There was, however, no distinction in Deaver's time of a simple versus radical prostatectomy the way it is known today. In contrast to the Halstedian definitions reserved for benign and malignant disease, respectively, Deaver and his colleagues viewed a "simple prostatectomy" as a resection of visually offending lobes and a "radical prostatectomy" merely a more aggressive resection of the entirety of the prostatic adenoma. Thus, Deaver's writing on "radical prostatectomy" was not an operation for cancer, as would be described by HH Young in his pioneering 1904 perineal approach for malignant disease.(26,27) Deaver's work was instead focused on the perineal and suprapubic approaches for clinically benign disease and often quoted and studied the techniques, patient positioning, and results of Freyer and Proust. In Deaver's time, the anatomic relationship of the prostatic adenoma, the prostatic urethra, and the prostatic capsule was not fully appreciated, especially in large prostate glands, even by surgeons like Freyer who many contemporaries claimed was "labouring (sic) under a grave misapprehension" that he was able to remove the adenoma and leave the "urethra entirely intact."(9, p.13) Such operations, though, were performed in the early 20th century when methods to ensure anesthetic and surgical safety were at their infancy and self-retaining in-dwelling balloon catheters had not been developed. Deaver knew that many men undergoing surgery for prostate enlargement were frail and elderly and he was well aware of the narrow window of clinical safety for these men. "I do not think I can justly be accused of being a timid operator," Deaver wrote in 1904, "but I am free to confess that I am afraid to do too much to some of these old men: their tenure on life is slight, and pressing our manipulations too far may, at any moment, 'loose the silver cord', and instead of curing our patient by a brilliant operation, we shall have killed him by meddlesome surgery."(9, p.204). Deaver relied on statistics of the craft and published the mortality rates of all the known approaches to surgical resection of the prostate, and described in detail the two fatalities of his own (although he was unable to clinically explain the etiology for their post operative demise).

The physiologic risks to the patient, and the stress on the surgeon, was great, Deaver warned, and that far better time would be spent in an operation's preparation

than in its performance. "The shock of the operation is a strain on even a well-preserved heart; but it may be much lessened by getting the heart into training previous to the operation….and the routine administration of cathartics… is debilitating to the extreme."(9, p.216) Thus, there were efforts to explore non-operative methods of treating prostatic enlargement and Deaver was no exception.

J. William White was the first to advocate for castration as a method to treat the enlarged prostate and was embraced by several other practitioners including Deaver. The use of castration was, lamented Deaver, somewhat "indiscriminate" and often led to disastrous consequences and mortality rates of 10-15%.(9, p.196) "One of the chief dangers", he wrote was "the development of mania, which seems dependent on the removal of the sexual organs, and not upon the mere fact of there having been an operation of some kind performed, as has been claimed by a few writers."(9, p.197) Deaver shared his successes and failures on many occasions and on the subject of castration for BPH he admitted that "a number of years ago I myself adopted this form of treatment with…unsatisfactory results; but I do not think it too much to say that I shall never employ it again. I regard it as an operation absolutely indefensible at the present time."(9, p.199). In a premonition of prostatic arterial embolization for BPH, Deaver acknowledged that some advocated for the use of surgical ligation of the internal iliac artery in hopes of causing ischemic atrophy of the prostate. His quoting deaths after such procedures due to peritonitis, renal failure, and gangrene of the foot suggest that Deaver lacked enthusiasm for its consideration.(9)

Deaver was a prolific author and at the time of his textbook on prostatic enlargement he also published books on surgery of the upper abdomen, the head and neck, on appendicitis, and on surgical anatomy.(3,28,29) In addition to his six books, he authored about 250 papers.(1) His depictions of deep pelvic and prostatic anatomy included the course and derivation of Denonvillier's fascia, the somatic innervation of the prostate (and the description of referred pain to the penile meatus), and the smooth muscle surrounding the prostatic urethra preceded current models by 80 years.(9,10). His expertise also included textbooks on the management of male urethral strictural disease, management of bladder tumors, and the history of medicine. His textbook on prostatic surgery alone containing 200 historical citations. (30-32). Deaver's 1910 lecture "When and by whom should surgery be advised", delivered at the 144th annual meeting of the Medical Society of New Jersey, began a phase of his career where his experience and sagacity led to establishing evolving concepts of quality assurance and critical analysis.(7) His 1923 book, with SP Reimann, *"Excursions into Surgical Subjects"*, could now have far greater horizons upon which to write his opinions in contrast to the highly specific subject material of his earlier works.(20) The treatise touched on biliary surgery, a hagiography on Louis Pasteur, and thoughts to encourage younger surgeons through the "trials and tribulations" of a surgical life.

The Famous Retractor.

It is unknown when Deaver envisioned a narrow instrument with a long, curved, and blunt end to assist with deep pelvic retraction. He makes no mention beyond the "simple retractors" needed for appendectomy in his 1896 work on the subject.(3) There were no specifications of any retractors at all in his 1909 work *Surgery of the Upper Abdomen* although some illustrations in the work allude to an early form of one.(28) Newhook et al. believed that the first mention of Deaver's retractor was in Deaver's own article in a 1928 issue of the *Journal of the American Medical Association (JAMA)* on papillary cystadenocarcinoma of the ovary and its surgery.(33) However, the retractor had already been included in standard hospital surgical supply catalogues as early as 1915 when a 1-inch wide stainless steel device was priced at $1.00.(34) AB Johnson's marvelous 1915 tome on abdominal surgery invoked the use of the Deaver in most deep abdominal operations and Norman Guiou of Ottawa favored a 1 inch Deaver in a 1923 article on transperitoneal Cesarian section to displace the bladder downward.(35,36) Deaver retractors had become standard military equipment by World War II appearing in the operating room set-up requirements for open stomach, liver, and kidney procedures.(37)

The Deavers

Deaver had children well into his later years. He married Caroline Randall (1868-1945) in 1889 who gave birth to Elizabeth (Thomson)(1891-1968), Harriet (Alexander) (1895-1970), John Blaine Deaver, Jr. (1898-1921), and Joshua Montgomery Deaver (1901-1978), a noted physician in his own right, born when Professor Deaver was 43. The Deavers purchased a 44 acre plot of land in Wyncote, Pennsylvania in April 1898 for $25,000 where they would build their home off Mill Road.(38) Deaver was particularly attached to his young son, John Jr., who appears to have died in Hot Springs, Arkansas at the age of 22 when his father was already 66.(38) The Deavers had John, Jr. interred at Laurel Hill Cemetery West in Bala Cynwyd, Pennsylvania and he chose to dedicate the 1922 edition of his textbook on prostate disease as follows: "To the memory of J.B.D., Jr., who departed this life at the threshold of manhood, and who I had hoped would travel in my footsteps, this book is affectionately dedicated."(39, 10) Deaver may have undergone an important personal

transformation, or sustained the beginning of serious medical problems, soon thereafter and retired from his academic obligations in June of 1922 much to the "regret" of the Board of Trustees of the University of Pennsylvania who accepted his resignation.(40)

Demise

Deaver himself died on September 25, 1931, at the age of 76, presumably from prostate cancer, while being treated with pelvic X-ray therapy by his friend, the 'skiagrapher' (i.e. radiologist), Henry Khunrath Pancoast (1875-1939) at the University of Pennsylvania. The details of Deaver's disease, his therapy, and outcomes are unknown as Pancoast destroyed all evidence and X-rays at the request of his esteemed patient. He was interred next to his son John Jr in the Deaver family plot at Laurel Hill.(39) Franklin H. Martin (1857-1935) founded the *Journal Surgery, Gynecology and Obstetrics* in 1905 and served as the 1928-1929 President of the American College of Surgeons (1913). In his obituary of Deaver, Martin wrote that Deaver was an "enthusiastic statesman of surgery…a star operator, and early achieved international fame. He loved his chosen work which he pursued, with great industry and without signs of weakening, to the age of seventy-five. The surgeons of every land, when they visit Philadelphia in the future, will miss this genial host with his philosophy, his irrepressible humor, his diagnostic skill, and his marvelous technique."(1)

DISCUSSION

On Tuesday, June 28, 1910, John Deaver rose to the dais at the Hotel Chalfonte, Atlantic City at a meeting of the Medical Society of the State of New Jersey and gave the invited lecture, "Why and By Whom Should Surgery be Advised".(7) At the age of 55, Deaver spoke not about the details of prostatic, gall bladder, or appendiceal surgery but rather surgery as a craft and rallied surgeons to be the patient's strongest advocate for timely surgical care.

"I have seen physicians felicitate themselves," he said, "upon finding a dangerous and difficult condition as indicating that their recourse to an operation was fully justified. The time has come when such a state of affairs constitutes a reproach, meaning that the best time has been allowed to pass and the patient brought by delay in jeopardy of is life. An easy operation means a safe and easy recovery." He coined the term "living pathology" as an invective to encourage pathologic diagnoses to be made in the living patient and prevent subsequent disease.

It follows that he was also a strong proponent of "preventative surgery", as opposed to preventative medicine which, he felt, dealt with the mere prevention of disease in the "normal person". Preventative surgery, in contrast, Deaver felt was clinical care directed to those "who have already been seized with an affection… and aimed to prevent the disastrous consequences of a diseased process already set in motion." Deaver appears visionary when seeing surgery as an important component of a medical consortium of experts rather than as a pyramid with any one specialty at any tier. "To fight disease," he declared, "we must be brothers in arms. For every operation, there should be many consultations, instead of many operations for every consultation…I respectfully submit…that the physician alone is not a safe judge of the time or necessity for surgical treatment….The decision should be arrived at as the product of medical and surgical deliberation together…The best interest of the patient will be conserved, precipitate surgery will be checked, and likewise eleventh hour operations be relegated to the past".(7, p.63) Deaver's death at the age of 76 brought to close an unheralded legend in his own time, devoted to the teaching of his craft and its betterment, but in full acknowledgement of its limitations. He apprehensively saw a future world of sub-specialization in which surgeons would strive to excel in "healing one disease and not to be expert in curing many"; to suffer a kind of "detachment of interest…apt to exaggerate the importance of their particular functions."(7) Deaver's biography reminds us, therefore, of a prolific life beyond his innovative interests in modernizing abdominal, deep pelvic, and urologic surgery, but also in the responsibility of surgeons to better our craft in the interests of the patient.

In his 1922 American College of Surgeons Presidential Address, Deaver spoke of the continued need of self-improvement, especially in a rapidly evolving and complex medical world. "…We who are daily at work at the operating table and in the sick room, know full well the limitations of our science… (Our) practice and the lack of finality in the art in which we are 'looking for the high white star of Truth', (inspire us) to become masters, and the mastery of which today is beset with much greater difficulty than at any former time."(8 p.606)

CONCLUSION

Deaver thus provides us with a compelling biography. He improved a physical aspect of the surgical world, with a device as simple as the retractor that bears his name, but his impact on others was complex. He expected much of others and set the bar of patient service exceedingly high which he viewed as an almost sacred calling. He also inspired the young and was deeply dedicated to the education of future generations to ensure continuously improving patient care.

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