

History of Medicine in Kashmir

Bladder Stone A Historical Overview 3

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From the depths of darkness, He will lead them forth into light. (The Holy Quran: 2.257)

Cutting for a bladder stone through the perineum or the abdomen, or crushing it blindly and washing out the fragments is okay, but how about looking inside the bladder and dealing with the stone within it under vision? That must have been a curious challenge for our ancestral thinkers and when curiosity and necessity converge the end product is innovation. As Albert Einstein said, "I am neither especially clever nor gifted, I am only curious."

To look inside you needed a tubular instrument that could be introduced through the urethra, and light to provide illumination that would allow the examiner to inspect the inside of the bladder and deal with the problem. Easier said than done, but in 1806 Philip Bozzini was the first to use a beeswax candle as the source of light on a tubular instrument to visualize the internal organs.¹ He called it the 'Lichtleiter' (light conductor). It was made of silver and was protected with shark skin. Apparently, a specimen is present in the museum of the College of Surgeons in Chicago². His work was reviewed by the medical faculty of Vienna but he was punished for 'undue curiosity,' and therefore he could not use it on humans. However, the French surgeon Antoine Jean Desormeaux (1853) considered to be the 'Father of Endoscopy'³ was the first to introduce the 'Lichtleiter' of Bozzini into a patient. His instrument had a system of mirrors and a lens, with a lamp-flame of alcohol and turpentine in a reservoir as the light source. Burns was however, a major issue with his innovation.

It was, Maximilian Nitze (1876) a German physician who along with the Vienna-based instrument maker Josef Leiter

produced the first cystoscope that could be used on humans.⁴ Nitze stated, "To light up a room one must carry the lamp inside." "By inducing the light source which is placed at the distal end of the cystoscope into the bladder, we are simplifying the examination technique. . ." "A galvanic glowing platinum wire should be the source of light, a continuous circulation of cold water should neutralize the produced heat."

Soon after the invention of the light bulb by Thomas Edison (1880), Nitze created the first optical endoscope with a built-in electrical light bulb as the source of illumination. Boisseau du Rocher (1889) separated the cystoscope into two parts: The lens- carrying component and the sheath with a bulb at the end, and in 1900, using the Nitze model, American Cystoscope Manufacturing Inc (ACMI) introduced the Brown Burger Cystoscope with all its attachments. Thus, by the turn of the Century a human eye could inspect the interior of the urinary bladder.

The author learnt the technique of cystoscopy using the Brown Burger and Brash (direct-vision zero-degree) cystoscopes. Both these instruments had a bulb at the end that would illuminate the bladder. The problem was that the illumination wasn't bright enough, particularly with turbid or blood-stained urine and the bulb life was unpredictable, which invited ire from the theatre staff. However, these instruments were adequate enough for bladder inspection, ureteric catheterisation and other minor procedures retrieval

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of small bladder stones. Importantly, with the development of cystoscopic lithotrite by Hugh Hampton Young (1870-1945) ⁵ one could crush a bladder stone under vision and wash out the fragments.

The endoscopic revolution happened during the 1970s after Reading (England) based Physicist Professor Harold Hopkins invented the Rod Lens System and Coherent Fibre-optics. This meant that the light source would sit outside the body and coherent glass fibres would carry the light beam through a series of lenses.⁶ The German entrepreneur/engineer/instrument maker Karl Storz used the Hopkins model and produced high quality endoscopic instruments, which opened new horizons for the world of Medicine as we moved from the era of candlelight to sunlight. Looking at the bladder and the stone within it in bright light thus became a luxury but some form of energy was needed to break or crush the stone.

The manual lithotrite used physical energy but search was on for other energy sources. The first modern intracorporeal lithotripter invented by the Ukrainian Engineer Yutkin in 1954 was Electrohydraulic lithotripsy but its use for bladder stone treatment emerged from Europe and USA during the 1970s.⁷ Mulvaney described the use of ultrasound for the destruction of urinary stones in 1953 but Kurth popularised its use in 1977.⁵ Lithoclast, designed by a Swiss company in 1992 used pneumatic shock waves induced by a compressor to break the stone.⁸ Modern lithotripters use a combination of ultrasonic and pneumatic waves generated by electromagnetic propulsion systems to deliver controlled ballistic energy. The use of laser was initiated during the 1980s⁹ but in recent years there have been significant advances in power generation systems and laser fibres. Laser lithotripsy is currently the treatment of choice for urinary stone disintegration.

In Kashmir until the arrival of Christian missionary doctors—Elmslie followed by Neve brothers, the populace had to depend on Hakim Saheb's sheera and opium for the alleviation of pain and suffering caused by urinary calculi. Neve brothers introduced the concept of antisepsis in the valley and offered surgical treatment to stone sufferers, emphasising the importance of thorough skin preparation with soap and water, shaving and use of antiseptics.¹⁰ Despite their meticulous attention to antiseptic techniques infection was still a major issue.

The discovery and mass production of Penicillin in the 1940s was the turning point in the fight against sepsis, which resulted in safer outcomes for stone sufferers after open surgery. During the same decade in 1946 SMHS Hospital Srinagar opened its doors to the public and Dr Fazal Rehman, the first Kashmiri surgeon with a Royal College Fellowship in General Surgery, considered the father of modern surgery in the valley, took charge as the Superintendent and Surgeon Specialist.¹¹ By then the perineal approach for bladder stones had been abandoned in favour of the suprapubic approach.

During the mid-1960s when the author started walking the long corridors of SMHS Hospital as a surgical house officer, almost every general surgical theatre list included a patient undergoing suprapubic cystolithotomy. This was in fact one of the first procedures taught to a surgical apprentice at that time and the author remembers with clarity the tutorials from seniors on the technique of swabbing the peritoneal reflection from the bladder and the emphatic warnings about not making a hole in the peritoneum and on meticulous water-tight two-layer closure of bladder wall.

The development of high-quality endoscopes, followed by rapid advances in technology at the turn of the millennium changed the profile of surgical treatment for diseases in general and for urinary stones in particular. The newer surgical armamentarium arrived in Kashmir too as Urology established itself as a specialty in the valley. My Kashmir based colleagues inform me that all aforementioned stone fragmenting gadgets are currently available in various urology centres in the valley.

The great Hippocrates warned the medical fraternity about not to 'use the knife, not even, verily, on sufferers from stone. . .' If he was alive today, he would find that technological revolution has put us in a position where cutting for urinary calculi with a knife, in particular bladder stones, is required only in extremely rare circumstances. It would, however, be pleasing for him to know that the person dealing with urinary stones continues to be a human because it won't be long before the task is taken over by a humanoid.

REFERENCES

1. Scott WW Jr, The development of the cystoscope. From "Lichtleiter" to fibre optics. *Invest Urol*, 1969; 6: 657-661.

2. Figdor PP: The Development of Endoscopy in the 19th century. Tuttlingen, 2004, pp 129. (Quoted in European Museum of Urology website, Desormeaux's Endoscope, <https://history.uroweb.org/>)
3. Wallace DM, New Lamps for old. President Address to Urology Section of The Royal Society of Medicine Meeting, 26 October 1972, JRSM, 1973;66: 455.
4. Maximilian Nitze, "On a new illumination method of the cavities of the human body". In: Wiener Medizinische Wochenschrift 26, 1879. European Museum of Urology (Under the auspices of European Association of Urology).
5. Shah J, Whitfield HN. Urolithiasis through the ages. Br J Urol. 2002; 89: 807.
6. Gow J G. Harold Hopkins and optics in Urology-an appreciation. Urology, 1998 Jul;52(1): 152-7.
7. Grocela JA, Dretler SP. Intracorporeal Lithotripsy: Instrumentation and Development. Urological Clinics of North America. 1997;24(1): 13-23.
8. Denstedt JD, Eberwein PM, Singh RR. The Swiss Lithoclast: a new device for intracorporeal lithotripsy. J Urol. 1992;148:1088.
9. Johnson DE, Cromeens DM, Price RE. Use of the holmium:YAG laser in urology. Lasers Surg Med 1992; 12: 35363
10. Neve Arthur and Neve Ernest F, The Mortality of Ten Thousand General Surgical Operations in The Kashmir Mission Hospital, The Lancet, 1891:138, 171-172.
11. Mufti Gulzar, Kashmir in Sickness and in Health, Partridge India, Penguin Books India Pvt. Ltd. 2013, page 195.

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