

History of Medicine in Kashmir

Bladder Stone A Historical Overview (1)

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Over the centuries the human race has been tormented by pain and suffering caused by urinary stones and that includes the famous and the formidable like the first Emperor of Roman Empire Caesar Augustus, Physician William Harvey, Anatomist Antonio Scarpa, Oliver Cromwell, Napoleon Bonaparte, Isaac Newton, film maker Alfred Hitchcock, Hollywood film actor Roger Moore (James Bond), Ex-Indian Prime Minister Mrs Indira Gandhi, Ex-President of Indonesia Sukarno, Argentinian footballer Lionel Messi and Ex-Prime/ Chief Minister of Jammu & Kashmir State Mr Ghulam Mohammed Sadiq. Until very recently bladder stone used to be a common surgical diagnosis throughout the world and before the advent of analgesia and anaesthesia surgical treatment for such stones used to be frighteningly painful in fact torture that would invariably lead to a fatal outcome. *Sushruta Samitha*, which is a collection of ancient Indian medical texts describes the suffering of a patient afflicted with a bladder stone as follows: *'The tortured patient then grinds his teeth, presses on his abdomen and rubs his penis. Urine, flatus and faeces are passed with severe pains. In such a case, the stone is black, rough, irregular and covered with spikes like the maneleacadamba [Cadamba] flower.'*⁽¹⁾

There are two possible outcomes for a patient with bladder calculus. If it is small in size and the sufferer is lucky, the stone could pass out spontaneously. However, in most cases, there is a need to remove it by one of the three approaches: cut down to the bladder through the perineal

route, open the bladder above the pubis, or break the stone by means of appliances passed along the urethra into the bladder and wash out the fragments, thus avoiding the need for open surgery. In a series of articles, I shall endeavor to narrate the story of how surgical science arrived to the point where we are today and how did Kashmir valley adapt to the changing scenario of clinical management of urolithiasis, in particular bladder stones? Most of the events predated my existence, but I was lucky to witness some exciting developments during my lifetime.

CUTTING FOR STONE

Sushruta's explanation about how a bladder stone is formed, was that, *'when air and phlegm meet, a small stone is formed which grows towards the bladder outlet'*.⁽¹⁾ He recommended purgation and emetics to cleanse the system as the first line treatment, and if that didn't work then surgery was required.

In 400 B.C the Greek physician Hippocrates who some would regard as the father of Medicine described five signs in a patient suffering from bladder stone: *'Pain when one wishes to urinate, passage of the urine drop by drop as in strangury, blood-stained urine, the bladder being ulcerated by the stone, inflammation of the bladder and passage of the sand in the urine.'*⁽¹⁾ Since the disease was very common

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those days and healthcare practitioners weren't properly trained and regulated, Hippocrates warned about the misadventures of lithotomy performed by novices and quacks. In his ethical directive which became famous as the Hippocratic Oath he warned fellow practitioners: *'I will not cut, even for the stone, but I will leave such procedures to the practitioners of that craft.'*⁽²⁾

During the first century AD Cornelius Celsus of Rome described the procedure of perineal lithotomy what became known as *'methodus Celsiana'*.⁽³⁾ He stated that under the age of 14 it is easier to perform the procedure because the obstructing prostate is not present. He also advised that the procedure should be carried out only in the spring and the patient must drink nothing but water for some days before the operation, and take exercise to facilitate descent of the stone to the bladder neck. A child to be operated by him would be held in the lap of a strong assistant but an adult was held in lithotomy position and was restrained by three or four able bodied assistants. The patient was allowed plenty of alcohol to induce drowsiness. The bladder was approached through an incision in front of the anus and the bladder neck and bladder along with the stone contained within it was pulled down in front of the rectum. This procedure became known as the *'apparatus minor'*.

Management of bladder stones by herbal medicines and its surgical removal by the perineal route continued for many centuries and useful tips were added by Greek physicians Galen (131-200AD) and Paul of Aegina (625-690AD). With the establishment of Islamic states significant contributions started coming from the Middle East. In his book *'Al-Qanun-fe-al-Tib'* (*The Cannon of Medicine*) famous Persian philosopher and physician *Ibn-e-Sina* known as *Avicenna* in the West (980-1037AD) devoted a full section to causes, prevention and treatment of urinary calculus disease. He explained that, *'A stone is formed by both a sticky stuff mucus, pus or blood. . . and an active force fever . . . The inflammatory process petrifies the precipitate into a stone'*⁽⁴⁾. He compiled a list of 65 medicinal plants, 8 animal and 4 mineral products some for stone dissolution. Some of these were specifically for kidney stones, some for bladder stones and others for both. For a patient with retention of urine due to a bladder stone *Ibne-Sina* advised, *'If the patient lies on his back and his buttocks are raised and he was shaken, the stone moves away from*

the passageway... urine streams out, it may also be easy to push away the stone by a finger in the rectum... If that does not work, use a catheter to push the stone back... If it was difficult to be passed do not push hard'⁽⁴⁾. *Ibn-e-Sina* also designed malleable silver and leather catheters for patients with retention due to bladder stone.

Around the same period an Arab Andalusian physician from Cordoba, *Abu al-Qasim Khalafibn al-Abbas al-Zahrawi al-Ansari*, alias *Al-Zahrawi* and also known as *Abulcasis*, devoted a chapter to surgery of bladder stones in his book *Al Tasreef*. He described surgical lithotomy through the perineum and devised a scalpel for bladder stone called *Mibthaa* and an instrument for crushing it called *Meshaab*. He was also the first to perform transvaginal cystolithotomy.⁽⁴⁾

Guy de Chauliac (1300-1367), considered the father of French surgery, authored the *Chirurgia Magna* in which he warned against performing lithotomy on old men, cachectic patients, and feeble and apprehensive patients; in actual fact he never performed a lithotomy himself⁽⁵⁾. In 1651, Jan de Doot, a Dutch blacksmith in Amsterdam performed a lithotomy on himself. Using a kitchen knife, he removed a four-ounce palpable stone from his perineum. The calculus must have been small to begin with which probably got stuck in his urethra, eroded its wall and got bigger within a urethral diverticulum created by it.⁽⁶⁾

In 1520 AD Marianus Sanctus from Italy introduced a more radical procedure for bladder stones through the perineal route where he introduced a curved and grooved metal sound (dilator) into the bladder through the urethra and cut directly on the urethra, thus opening the prostatic area to expose the opening of bladder neck and then scooped out the stone from the bladder with a stone grasper. If the stone was big, it was crushed by a stone breaking forceps, and the bits removed thereafter. Since this technique was a more comprehensive surgical undertaking it was named the *'Apparatus Major'*.⁽¹⁾

An interesting development took place when an unqualified roving practitioner Mr Jacques Baulot (1651 b) introduced a new technique of perineal lithotomy which involved negotiating a grooved metal catheter in the bladder and incising the perineum lateral to the median perineal raphe. The rest of the operation involved posterior displacement of rectum and careful dissection of the bladder neck. All this

was done with the patient lying on the bag with legs apart and held in position by strong men. This became known as the '*Lateral Approach*'.⁽³⁾

The perineal route remained popular for hundreds of years and it took a long time for practitioners to adopt the suprapubic approach for removal of bladder stones. Pierre Franco was the first to successfully remove a bladder stone via the suprapubic route in a three-year old child in 1561, and that too by accident.⁽³⁾ The stone was of the size of a hen's egg which he could not remove through the perineum, so, he asked his assistant to push upwards towards the abdomen, made a cut through the abdominal wall and plucked out the stone. Even though his patient recovered he advised others not to undertake the procedure through the abdominal route.

In England the first successful attempt to undertake the procedure through the suprapubic route was by John Douglas in 1719.⁽³⁾ He studied anatomy and realised that by distending the bladder the peritoneum can be lifted from the bladder such that the operation becomes extraperitoneal. Three of his first four patients survived this operation. However, the person who achieved fame in England as a stone surgeon during the 18th century was William Cheselden. He used the suprapubic route on nine patients of which only one died. He called it the '*High Operation for stone*' and in 1723AD wrote a book entitled, '*A Treatise on the High Operation for the Stone*'. Despite his successes with this approach possibly due to complications, he reverted to the classical '*lateral approach*' through the perineum and published the results in his book '*Anatomy of the Human Body*'. Of the 230 procedures that he performed, 20 patients died a mortality rate of 9%.⁽⁶⁾ That must have been a commendable feat in an era when anaesthesia, antisepsis and antibiotics were unknown.

With the advent of anaesthetic drugs chloroform and ether, surgery became a painless undertaking and suprapubic cystolithotomy became the standard technique for removal of a bladder stone. With the adoption of Lister's principles of asepsis infections were avoided, and with the discovery of antibiotics infections became treatable. All this meant that surgery become safe. The blessing is that bladder stones which were so common and which caused so much misery and agony to countless humans in the days gone-by are becoming a surgical rarity.

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