

# The first successful minimal access operation

Harold Ellis

Members of the lay public and, indeed, many health-care professionals will think that minimal access or 'key-hole' surgery is a modern phenomenon. In fact, the first successful operation of this kind was performed 180 years ago, on 13 January 1824, when Jean Civiale crushed and removed a bladder stone transurethrally at the Necker Hospital in Paris.

Bladder stones have tortured mankind since the earliest ages. The oldest calculus discovered was obtained from the grave dated 4800 BC of a boy aged about 16 years at Al Amrah in Egypt and was made up of calcium phosphate and uric acid. The typical agonizing symptoms of stones were well recognized by the Hippocratic physicians of the 4th and 5th centuries BC and, indeed, 'specialist urologists' must have already been in existence; a portion of the Hippocratic Oath reads 'I will not covet persons labouring under the stone, but will leave this to men who are practitioners of this work'. So 'cutting for the stone', along with male circumcision and trephination of the skull, makes up one of the trio of the earliest elective operations.

Opening the bladder via the perineum to remove a stone was performed by the ancient Hindu surgeons, the Greeks, Romans and the Arabs. Ammonius of Alexandria is documented to have performed the operation in about 200 BC. A similar technique was performed in these widely scattered centres and remained unchanged over the centuries. How the perineal approach, requiring a detailed knowledge of anatomy, was devised remains a mystery. The patient was held by strong assistants with the thighs flexed and abducted – the 'lithotomy position' as it is still called today. The surgeon's left index finger was inserted per rectum, the right hand

pressed forcibly on the lower abdomen, and the stone forced down onto the grip of the finger in the rectum, pressing the calculus against the perineum. An incision was made in front of the anal verge and carried deeply into the bladder base; the stone was then pushed out, either by the finger in the rectum, or evacuated by the right index finger, or, if necessary, by means of a hook or forceps – all this, of course, without the benefit of anaesthesia.

This operation, requiring only a knife and perhaps a hook or forceps, became known as the 'apparatus minor'.

In the early 16th century, a new operation was devised by Franciscus de Romanis of Cremona in Italy and popularized by his pupil, Marianus – the operation of the 'apparatus major'. A grooved staff was passed along the urethra into the bladder and the knife run along the groove to open the posterior urethra and the bladder base. Forceps were then passed into the wound to grip and remove the calculus, or, if too large, instruments were used to crush the stone and the fragments evacuated with a hook or scoop. Agonizing pain, high mortality, and complications which included drenching haemorrhage, massive sepsis, injury to the rectum and persistent fistula were to be expected, yet such was the agony of the stone that patients submitted themselves to this torture.

Over the ages surgeons dissatisfied by the difficulties and dangers of cutting for the stone dreamed of some means of removing the calculus through the natural orifice, the urethra. Some patients experimented on themselves – General Marshall of Lucknow disintegrated his stone in 1783 by 9 months of steady work using a fine curved file, while Astley Cooper, of Guy's Hospital, described how he removed a total of 84 small stones from an old priest using specially devised fine curved forceps at repeated sittings.

So now we come to our anniversary. Jean Civiale (1792–1867), while still a medical student under the great Baron Dupuytren, commenced a series of experiments to ascertain whether it was possible to crush stones in the bladder without injuring its walls.

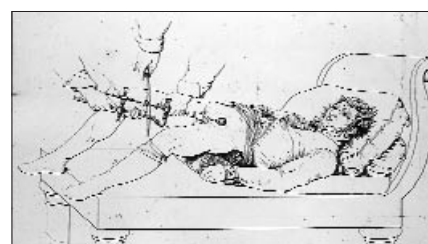
On 13 January 1824, at the Necker Hospital, he successfully used his first apparatus, termed the trilabe (*Figure 1*). This instrument consisted of two metal cylinders, one within the other, the inner of which had three branches fixed to its distal end by means of hinges. The inner tube was extended within the bladder, manipulated to seize the stone, then withdrawn into the mouth of the outer tube, so that its three branches would impact the stone against the orifice of the outer tube. A drill passed down the inner tube was then used to disintegrate the stone, whose fragments were then passed per urethram.

All this, of course, was carried out without the benefit of anaesthesia, with no radiology or cystoscopy to help make an accurate assessment of the stone and the bladder anatomy, and requiring what was, without doubt, the most exquisite manual dexterity and sense of touch to manipulate the stone safely into the clutch of his instrument. The patient recovered, and minimal access surgery was born. **HM**

Figure 1 is reproduced from Civiale (1847).

Civiale J (1847) *Traité Pratique et Historique de la Lithotritie*. Baillière, Paris

Figure 1. 'Un malade au moment de l'opération'. The calculus has been trapped between the jaws of the trilabe and, in this modification of the instrument, is being drilled by a gimlet activated by a bow.



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