

Arab and Muslim Physicians and Scholars

Abu Al Qasim Al Zahrawi (Albucasis): Pioneer of Modern Surgery

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Abu Qasim Khalaf Ibn Abbas Al Zahrawi, known in the West as Albucasis or Zahravius, was born in 936 AD in Al-Zahra', a suburb, six miles northwest of Cordoba, the capital of Muslim Spain (Al-Andalus). His ancestors were from the Al Ansar tribes of Al Madina Al Munawwarah who came from the Arabian peninsula with the Muslim armies which conquered and lived in Spain. Al-Zahrawi traveled rarely, and spent most of his life in his hometown as a practicing physician-pharmacist-surgeon.¹

He served as the court physician to Caliph Al-Hakam-II, at a period considered as the "Golden Age" of Arab Spain when natural and mathematical sciences reached their peak. After a long and distinguished medical career, he died in 1013 AD at the age of 77.

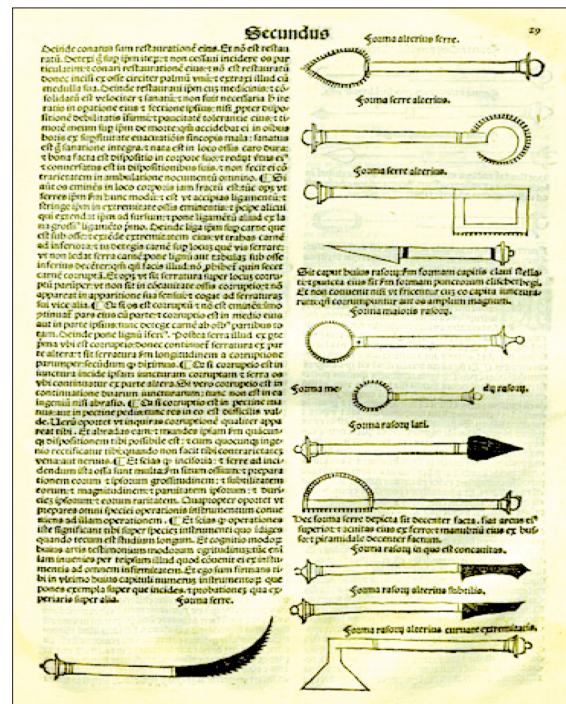
Around the year 1000 AD, he wrote his famous book "*Al Tasreef Liman 'Ajaz 'Aan Al-Taleef*", (The Clearance of Medical Science For Those Who Can Not Compile It). It was a summation of about fifty years of medical education, training, practice and experience. The thirty volumes of the medical encyclopedia covered various aspects of medical knowledge. In addition to sections on medicine and surgery, there were sections on midwifery, pharmacology, therapeutics, dietetics, psychotherapy, weights and measures, and medical chemistry.¹

In *Al-Tasreef*, three chapters were devoted to surgery. Some of the procedures and techniques detailed in these chapters include the following:

- Surgery of the eye, ear, and throat. He fully described tonsillectomy and tracheostomy.
- He devised instruments for internal examination of the ear.
- He devised an instrument used to remove or insert objects into the throat.
- He described how to use a hook to remove a polyp from the nose.
- He described the exposure and division of the temporal artery to relieve certain types of headaches.
- He utilized cauterization, usually to treat skin tumors

or open abscesses. He applied cauterization procedure to as many as 50 different operations.

- Application of ligature for bleeding vessels and internal stitching utilizing catgut. He preceded the famous French military surgeon Ambroise Pare (1510-1590), claimed to be the first European to utilize sutures, by five centuries.
- Treatment for anal fistulas.
- Setting dislocated bones and fractures. His method for setting and reducing a dislocated shoulder was centuries before Kocher introduced his similar technique to European medicine.
- Removal of urinary bladder calculi. He advised that the treating physician has to insert a finger into the rectum of the patient, move the stone down to the neck of



Page from a 1531 Latin translation by Peter Argellata of Al Zahrawi's treatise on surgical and medical instruments.

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the bladder, then make an incision in the rectal wall or the perineum and remove the stone.

- He devised instruments for inspection of the urethra.
- He is credited to be the first to describe ectopic pregnancy.
- He devised several dental devices and artificial teeth made of animal bones.

Al Zahrawi is considered the father of operative surgery.^{2,3} He is credited with performance of the first thyroidectomy.⁴ The last chapter of his comprehensive book, named "On Surgery", was dedicated to surgical instruments. He introduced over 200 surgical tools, a staggering number by all standards. He gave detailed descriptions of for using probes, surgical knives, scalpels, and hooks. He also devised and invented surgical scissors, grasping forceps and obstetrical forceps. His illustrations of surgical instruments were the earliest intended for use in teaching and in methods of manufacturing them.¹

Abdel-Halim et al gave a detailed study of Al Zahrawi's technique of cystolithotomy after inventing operative instruments not known in the Greco-Roman era.⁵ They reviewed his operative technique in women, his recommendations of two -stage operation in complicated cases and his contributions to lithotripsy by introducing a crushing forceps (Al-Kalaleeb forceps) and a driller fragmenting forceps (Al-Mishaab) to remove impacted stones.⁵

Al Zahrawi contributed early descriptions of neurosurgical diagnoses and treatment including management of head injuries, skull fractures, spinal injuries and dislocations, hydrocephalus, subdural effusions,

headache and many other conditions.⁶ He described vividly a case of hydrocephalus due to congenital defect of drainage of cerebrospinal fluid: "I have seen a baby boy whose head was abnormally enlarged with prominence of the forehead and sides to the point that the body became unable to hold it up".¹

In addition, he made significant contributions to pediatric surgery. In addition to his description of hydrocephalus, he described harelip, adenoids, ranula, imperforated external urinary meatus, perforated anus, hermaphrodites, gynecomastia, supernumerary and webbed fingers.⁷ He was the first to describe in detail the medical aspects of hemophilia.

His medical writings were highly regarded in the West particularly after being translated by Gerard of Cremona, Rogerius Frugardi, Ronaldus Parmensis and others. His surgical teachings were the most advanced in the Middle Ages until the thirteenth century.¹

Al-Tasreef was an essential component of the medical curriculum in European countries for many centuries.⁸ The famous French surgeon Guy de Chauliac (1300-1368) quoted him over 200 times in his book appended its Latin edition to his own book on surgery. Several editions of this book (surgical chapters) were published including one at Venice (1497), at Basel (1541) and at Oxford (1778).

Finally, he emphasized child education and behavior, school curriculum and academic specialization. He advised that gifted and intelligent students be encouraged to study medicine after completing their primary education in language, grammar, mathematics, astronomy and philosophy.¹ This article is just a glimpse of the medical and surgical contributions of this great Arab physician from Andalus to the world.

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