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Al-Zahrāwī (*Albucasis*) the Great Andalusian Surgeon

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AL-ZAHRĀWĪ (ALBUCASIS) THE GREAT ANDALUSIAN SURGEON

"Without doubt Albucasis was the chief of all surgeons"

Pietro Argallata

Dr. Sharif Kaf Al-Ghazal*

Keywords: *Abu al-Qasim Khalaf ibn 'Abbas al-Zahrawi, Zahrawi, Zahraoui, Albucasis, Islamic medicine, history of medicine, surgery, instruments of surgery, At-Tasrif, al-Tasrif.*

Abū al-Qāsim Khalaf ibn 'Abbās al-Zahrāwī (936-1013 CE), known to the West by his Latin name *Albucasis*, was born in al-Zahrā', six miles northwest of Cordoba in Andalusia. He was simply the greatest Muslim surgeon. The European physicians and surgeons regarded him as a greater authority than even Galen, the ancient world's acknowledged master. It is clear from Al-Zahrāwī's life history and from his writings that he devoted his entire life and genius to the advancement of medicine as a whole and surgery in particular.

What is known about al-Zahrāwī is contained in his only written work: *At-Tasrif liman 'ajiza 'an at-ta'lif* (The Method of Medicine). *At-Tasrif* is a medical encyclopaedia compendium of 30 volumes compiled from medical data that al-Zahrāwī accumulated in a medical career that spanned five decades of teaching and medical practice. He apparently travelled very little but had wide experience in treating accident victims and war casualties.

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Figure 1. Manuscript of al- al-Zahrāwī (Maghrib, 16th century). Source: <http://www.bium.univ-paris5.fr/aspad/expo51.htm>

The last and largest volume of *At-Tasrīf* named "On Surgery" was nothing less than the greatest achievement of medieval surgery. It was the first independent surgical treatise ever written in detail. It included many pictures of surgical instruments, most invented by al-Zahrāwī himself, and explanations of their use. Al-Zahrāwī was the first medical author to provide illustrations of instruments used in surgery. His treatise of surgery contains approximately 200 such drawings ranging from a tongue depressor and a tooth extractor to a catheter and an elaborate obstetric device.

The variety of operations covered is amazing. Al-Zahrāwī discussed bloodletting, midwifery and obstetrics, the treatment of wounds, the extraction of arrows and the setting of bones in simple and compound fractures. He also promoted the use of antiseptics in wounds and skin injuries, and devised sutures from animal intestines, silk, wool and other substances. He described the exposure and division of the temporal artery to relieve certain types of headaches, diversion of urine into the rectum, reduction mammoplasty for excessively large breasts, dental surgery, and the extraction of cataracts. He wrote extensively about injuries to bones and joints, even mentioning fractures of the nasal bones and of the vertebrae, in fact 'Kocher's method' for reducing a dislocated shoulder was described in *At-Tasrīf* long before Kocher was born.

Al-Zahrāwī outlined the use of caustics in surgery, fully described tonsillectomy, tracheotomy and craniotomy operations, which he had performed on a dead foetus. He explained how to use a hook to extract a polyp from the nose, how to use a bulb syringe he had invented for giving enemas to children and how to use a metallic bladder syringe and speculum to extract bladder stones.



Figure 2. Latin translation of al Zahrāwī's book. Source:
<http://www.konyvtar.elte.hu/kincseink/kezirat/kepek/n07.jpg>

Al-Zahrāwī was the first to describe the so-called "Walcher position" in obstetrics; the first to depict dental arches, tongue depressors and lead catheters and the first to describe clearly the hereditary circumstances surrounding haemophilia. He also described ligaturing of blood vessels long before Ambroise Paré (ca 1510-1590). Al-Zahrāwī also had priority in detailing the classic operation for cancer of the breast, lithotrities for bladder stones, and techniques for removing thyroid cysts.

Besides all these achievements, al-Zahrāwī was considered one of the early leading "plastic surgeon" as he performed many plastic surgery procedures. In the 11th chapter of volume 30 of his book, he put many principles in that surgical field. He used ink to mark the incisions in his patients preoperatively which became now as a routine standard procedure. In chapter 26, he explained the differences between primary and secondary wound closure and also the importance of wound debridement before closure.

In chapter 47, he described the surgical options to treat Gynecomastia as he recommended removal of the glandular tissue by a C-shaped incision. For large breasts with excess skin that cannot be corrected with glandular excision alone, he recommended to "make two incisions so that the edges join each other, then

remove the skin and glandular tissue in between and suture the edges of the defect". This technique is still considered for such a condition nowadays.

Al-Zahrāwī had a special interest in eyelid surgery. He gave sensible suggestions on the use of fine instruments, of which he had a wide variety. He described surgical management of different pathologies such as entropion, ectropion, trichiasis and symblepharon.

In the treatment of entropion, al-Zahrāwī advised eversion of the eyelid with fingers or with a traction suture. An incision under the eyelashes from medial to lateral is then carried out so that the skin is separated from the lid margin. A leaf-shaped piece of eyelid skin is excised, and lash eversion is achieved as the defect is sutured primarily. He also classified ectropion as congenital and acquired; he advised eversion and resection of a base-down triangular segment from the inner layers for lower lid laxity to treat to cases of eye ectropion.

His book *At-Tasrīf* is also the first work in diagramming surgical instruments, detailing over two hundred of them, many of which al-Zahrāwī devised himself. Many of these instruments, with modifications, are still in use today. Once *At-Tasrīf* was translated into Latin in the 12th century, al-Zahrāwī had a tremendous influence on surgery in the West. The French surgeon Guy de Chauliac in his *Great Surgery*, completed in about 1363, quoted *At-Tasrīf* over 200 times.

With the reawakening of European interest in medical science, al-Zahrāwī's treatise quickly became a standard reference and was translated into Latin five times. The arrangement of the work, its clear diction, and its lucid explanations all contributed to its popularity and great success.

Al-Zahrāwī was described by Pietro Argallata (died 1423) as "without doubt the chief of all surgeons". Jaques Delechamps (1513-1588), another French surgeon, made extensive use of *At-Tasrīf* in his elaborate commentary, confirming the great prestige of al-Zahrāwī throughout the Middle Ages and up to the Renaissance.

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