

Brief Introduction of Az-Zaharawi's Contributions in Science

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History is full of description of great Muslim scientists and great patrons of sciences and research; however there is serious lack of awareness that keeps world not acknowledging their efforts and contributions to modern day sciences. Acknowledgment of their contributions will help nullifying the deliberate defamation of Islam and Muslims.

One of the great Muslim Scientists is Abū al-Qāsim Khalaf ibn al-'Abbās al-Zahrāwī (936-1013), (Arabic: أبو الزهراوي العباس بن خلف القاسم), popularly known as Al-Zahrawi (الزهراوي), Latinized as Abulcasis (from Arabic Abū al-Qāsim), was an Arab Muslim physician and surgeon who lived in Al-Andalus. He is considered the greatest medieval surgeon to have appeared from the Islamic World, and has been described as the father of surgery. His greatest contribution to medicine is the **Kitab at-Tasrif**, a thirty-volume encyclopedia of medical practices.[2] His pioneering contributions to the field of surgical procedures and instruments had an enormous impact in the East and West well into the modern period, where some of his discoveries are still applied in medicine to this day.

Al-Zahrawi was born in the city Az-Zahra, northwest of Córdoba, Andalusia. The nisba (attributive title), Al-Ansari, suggests origin from the Medinian tribe of Al-Ansar. He lived most of his life in Córdoba. It is also where he studied, taught and practiced medicine and surgery until shortly before his death in about 1013, two years after the sacking of Az-Zahra. A few details remain regarding his life, aside from his published work, due to the destruction of Az-Zahra during later Castillian-Andalusian conflicts. His name first appears in the writings of Abu Muhammad bin Hazm (993 - 1064), who listed him among the greatest physicians of Moorish Spain. But we have the first detailed biography of al-Zahrawī from al-Ḥumaydī's *Jadhwat al-Muqtabis* (On Andalusian Savants), completed six decades after al-Zahrawi's death.

Works:

He was a contemporary of Andalusian chemists such as Ibn al-Wafid, Maslamah Ibn Ahmad al-Majriti and Artepheus.

He was the first physician to identify the hereditary nature of haemophilia.

He devoted his entire life and genius to the advancement of medicine as a whole and surgery in particular. His best work was the *Kitab al-Tasrif*.

Al-Zahrawi specialized in curing disease by cauterization. He invented several devices used during surgery, for purposes such as inspection of the interior of the urethra, applying and removing foreign bodies from the throat, inspection of the ear, etc. He is also credited to be the first to describe ectopic pregnancy in 963, in those days a fatal affliction.[3] He was the first physician to describe an Abdominal pregnancy a sub type of ectopic pregnancy

Al-Zahrawi was the first to illustrate the various cannulae and the first to treat a wart with an iron tube and caustic metal as a boring instrument. He was also the first to draw hooks with a double tip for use in surgery.

Al-Zahrawi also described the use of forceps in vaginal deliveries.

He introduced over 200 surgical instruments.[8] Many of these instruments were never used before by any previous surgeons.

His use of catgut for internal stitching is still practised in modern surgery. The catgut appears to be the only natural substance capable of dissolving and is acceptable by the body.

Al-Zahrawi also invented the forceps for extracting a dead fetus, as illustrated in the *Al-Tasrif*.

Kitab Al-Tasrif:

Al-Zahrawi's thirty-chapter medical treatise, *Kitab al-Tasrif*, completed in the year 1000, covered a broad range of medical topics, including dentistry and childbirth, which contained data that had accumulated during a career that spanned almost 50 years of training, teaching and practice. In it he also wrote of the importance of a positive doctor-patient relationship and wrote affectionately of his students, whom he referred to as "my children". He also emphasized the importance of treating patients irrespective of their social status. He encouraged the close observation of

individual cases in order to make the most accurate diagnosis and the best possible treatment.

Al-Tasrif was later translated into Latin by Gerard of Cremona in the 12th century, and illustrated. For perhaps five centuries during the European Middle Ages, it was the primary source for European medical knowledge, and served as a reference for doctors and surgeons.

Not always properly credited, Al-Zahrawi's al-Tasrif described both what would later become known as "Kocher's method" for treating a dislocated shoulder and "Walcher position" in obstetrics. Al-Tasrif described how to ligature blood vessels almost 600 years before Ambroise Paré, and was the first recorded book to document several dental devices and explain the hereditary nature of haemophilia.[3] He was also the first to describe a surgical procedure for ligating the temporal artery for migraine, also almost 600 years before Pare recorded that he had ligated his own temporal artery for headache that conforms to current descriptions of migraine.[6] Al-Zahrawi was therefore the first to describe the migraine surgery procedure that is enjoying a revival in the 21st century, spearheaded by Elliot Shevel a South African surgeon. For a long time, Al-Tasrif was an important primary source for European medical knowledge, and served as a reference for doctors and surgeons. There were no less than 10 editions of its Latin version between 1497 and 1544, before it was translated into French, Hebrew, and English.

The 300 pages of the book on surgery represent the first book of this size devoted solely to surgery, which at that time also included dentistry and what one may term surgical dermatology. Here, Az-Zahrawi developed all aspects of surgery and its various branches, from ophthalmology and diseases of the ear, nose, and throat, surgery of the head and neck, to general surgery, obstetrics, gynecology. Military medicine, urology, and orthopaedic surgery were also included. He divided the surgery section of Al-Tasrif into three part:

1. On cauterization (56 sections);
2. On surgery (97 sections),
3. On orthopaedics (35 sections).

Liber Servitoris:

In pharmacy and pharmacology, Az-Zahrawi pioneered the preparation of medicines by sublimation and distillation. His Liber Servitoris is of particular interest, as it provides the reader with recipes and

explains how to prepare the "simples" from which were compounded the complex drugs then generally used.

On Surgery and Instruments:

On Surgery and Instruments is an illustrated surgical guide written by Az-Zahrawi. On Surgery and Instruments contributed many technological innovations, notably which tools to use in specific surgeries. In On Surgery and Instruments, he draws diagrams of each tool used in different procedures to clarify how to carry out the steps of each treatment. The full text consists of three books, intended for medical students looking forward to gaining more knowledge within the field of surgery regarding procedures and the necessary tools.

A copper spoon used as a medical implement to press down the tongue (dated from the 3rd century H/ 9th century CE, Abbasid period) preserved at the Museum of Islamic Art in Cairo. This tool demonstrates that the physicians of the Islamic medical tradition attached much importance to thorough physical examination in medicine and medical tools in various areas of treatment and how they developed them. A detailed description of these tools can be found in the book Al-Tasrif of al-Zahrawi

Az-Zahrawi claims that his knowledge comes from careful reading of previous medical texts as well as his own experience: "...whatever skill I have, I have derived for myself by my long reading of the books of the Ancients and my thirst to understand them until I extracted the knowledge of it from them. Then through the whole of my life I have adhered to experience and practice...I have made it accessible for you and rescued it from the abyss of prolixity".

Contributions to others works:

Serefeddin Sabuncuoglu (1385-1468) was a surgeon who lived in Amasia in central Anatolia. He wrote his book Cerrahiye-tu l-Hanniyye in 1460 at the age of 80 after serving for many years as a chief surgeon in Amasiya Hospital (Darussifa) for years. His text Cerrahiye-tu l-Hanniyye was presented to Sultan Mohammad the conqueror, but the manuscript disappeared afterwards until it emerged in the 1920s. The book is roughly a translation of Al-Tasrif of Al-Zahrawi, but Sabuncuoglu added his own experiences and brought interesting comments on previous application, besides that every surgical procedure is illustrated in his work.

William Hunter (1717-1783) used Arabic manuscripts for his study on Aneurysm. Among them was a copy of Az-Zahrawi's Kitab al-Tasrif. In his biography of

William Hunter, Sir Charles Illingworth, the author described the circumstances and the context of the purchase by William Hunter of an Arabic manuscript of Al-Tasrif of Al-Zahrawi, which he obtained from Aleppo in Syria.

To summarize, it is quite clear even from this very brief look into Az-Zahrawi's work that his contribution to surgery and other fields was significant and is benefitting us to this very day. Az-Zahrawi was not only one of the greatest surgeons of medieval Islam, but a great educationist and psychiatrist as well. He devoted a substantial section in the Tasrif to child education and behaviour, table etiquette, school curriculum, and academic specialization to.

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