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REVIEW

Abu Al Qasim Al Zahrawi (Albucasis): The father of modern surgery

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Abstract

Known as the father of surgery, Al-Zahrawi (936-1013AD) made significant contributions to modern medicine and surgery. His greatest contribution to science was his work "Kitab al-Tasrif", which he shared nearly fifty years of experience and medical education by writing and illustrating. In this study, he explained not only surgical interventions, but also the methods and surgical instruments developed by him for the diagnosis, treatment and care services of medicine. In the last chapter of Al-Tasrif consisting of 30 volumes, "On Surgery and Tools", he introduced many surgical instruments such as scalpels, forceps, retractors, curettes, pincers, specula, cauterization, and binding style instruments. This study aims to provide an overview of Al-Zahrawi's life whose contributions to science living in medieval Islamic geography are not limited to modern medicine care services and surgery.

Keywords: *Abu al-Qasim Al-Zahrawi, Albucasis, Kitab al-Tasrif, the father of modern surgery, modern medicine, care services*

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Introduction

Abu al-Qasim Al-Zahrawi, also known in the West as Albucasis, was a great Arab physician and surgeon of the late 10th and early 11th centuries CE. Abu Al Qasim al-Zahrawi (936-1013AD), one of the most important figures in Medieval Islamic Civilization medical history, was born in Al-Andalus, al-Zahra (Medina Azahara). The full name of Al-Zahrawi was Abū al-Qasim Khalaf ibn al-Abbas al-Zahrawi al-Ansari [1,2]. He spent most of his life in Cordoba, Andalusia (Spain) [1]. Al-Zahrawi is referred to as the "father of modern surgery" for his work laying the foundations of modern medicine and his innovative practices in the field of surgery [1,3]. He devoted his whole life to the advancement of medicine and surgery as a whole. It is known that he continued his studies until two years before his death. However in the years following al-Zahrawi's death, little is known about his life, except for his published work, as al-Zahra was destroyed during the Castile-Andalusian conflict. Al-Zahrawi name is first mentioned in the writings of Abu Muhammad bin Hazm (993-1064 AD), who listed the most important physicians of Spain. However, the first detailed biography of al-Zahrawi is al-umaydi's work titled Cezvat al-Muktabis (On the Andalusian Savants) [4].

The medieval period is known as the golden age due to the scientific developments made by Islamic scientists. During this period, important medical advances were made, during which the foundations of modern medical practices were laid [2]. Al-Zahrawi played a vital role in the development of surgical practices and was considered the greatest surgeon of the Islamic golden age [1,5]. Al-Zahrawi, who studied in Cordoba and took lessons from the masters of this science center, has the title of surgeon who is the most known and whose works are known among muslim surgeons [2]. At that time he invented hundreds of instruments, some of which are still used today, and defined surgical practice [1,5,6].

Al-Zahrawi is known as a scientist who really thought well ahead of his time. Known best for his surgical knowledge and expertise, Al-Zahrawi is also known as a contemporary of Andalusian chemists [7]. He has described surgical techniques for a range of procedures covering modern plastic surgery and various subspecialties. Apart from being a physician and surgeon, Al-Zahrawi is known as an exceptional teacher who enthusiastically teaches medical students. He emphasized the value of physician-patient relationships and the importance of providing treatment and care to patients of all social groups [2]. However, Al-Zahrawi's contributions to science were not limited to these. Al-Zahrawi was a great educator and psychiatrist who pioneered the preparation of drugs through sublimation and distillation in pharmacy and pharmacology, and also devoted time to child education and behavior [7]. Al-Zahrawi also served as the court physician to the Umayyad rulers of Andalusia [4].

Al-Zahrawi's contributions to modern medicine and surgical science

Kitab al-Tasrif

The greatest contribution of al-Zahrawi to medical science is undoubtedly his work titled "et-Tasrîf limen Aceze an'd-Taâlîf", which he wrote towards the end of the 10th century and covered the whole of medicine [3]. Consisting of 30 volumes, Kitab al-Tasrif is known as a compilation of nearly fifty years of medical education and experience [2].
This work, which is the first illustrated surgical thesis, played an important role in the development of modern medicine and surgery in both the Islamic world and the West. Tasrif consists of three parts. The first section is based on cauterization recommendations and wound care in stroke (56 episodes), while the second section is divided into open surgical operations, ophthalmology, and oral diseases (97 episodes). The last part consists of various forms of bone fractures, dislocations and gynecology (35 episodes). In addition to all these, pharmacology, cosmetics, midwifery, psychotherapy and medical chemistry subjects were also included in the work [3,4]. It was used as a textbook in many European universities [8]. This work is known as a fundamental source that has been cited for hundreds of years in Islamic geography and Europe [6].

On Surgery and Instruments

In Al-Tasrif's "On Surgery and Instruments" volume 30, he explained the surgical applications and instruments that have not been mentioned in any book before. Surgery and instruments included dentistry, obstetrics and gynecology, head and neck surgeries, ear, nose and throat surgery, general surgery, urology, ophthalmology, dermatological surgeries, and traumatology [1].

Al-Zahrawi in his book revealed the need to redesign the simple and inadequate tools that have been used in operations for more than a thousand years. Al-Zahrawi described more than 200 surgical and

medical instruments, many of which were his own invention, with drawings and detailed descriptions. He explained in detail what materials these tools, should be made of and how these tools should be used. It is known that many of the surgical instruments described in the work are still in use. Among these tools, it is known that there are many tools used for simple or difficult operations such as cauterization tools, scalpels, special pointed scissors, labor tools, kidney stone tools [6]. Some of the tools made by Al-Zahrawi himself included forceps used in childbirth, a scissor-shaped tool to remove the tonsils without suffocating the patient, a special knife to cut the abscess without feeling sick, various hooks and pincers [9]. Today, the "Kocher's method", which is applied to treat a newly discovered dislocated shoulder, and the "Walcher position", which is used to facilitate difficult births, were described in this work at that time [7]. In addition in this study, experimental procedures and cadaver studies on live animals are also mentioned [9].

The final parts of this valuable work, which paved the way for modern medicine and surgery, have been translated into Latin by Gerard of Cremon in the XII. Century. Later, this translation was translated into Greek and Hebrew in the 15th, 16th and 18th centuries, reproduced many times and became widespread [9]. While this work had a significant impact on Italian and French surgeons, it became the surgical book of medical schools in Salerno and Montpellier [10].

Other Pioneering Contributions

Al-Zahrawi has brought new perspectives and solutions to the diagnosis and treatment of the disease not only in the field of surgery but also in anatomy, physiology, neurology, neurosurgery, orthopedics, gynecology, ophthalmology, and general surgery [3].

Al-Zahrawi made contributions to the management of trauma with new methods used to treat trauma patients in cases such as bleeding, airway obstruction, penetrating abdominal and arrow wounds, among his contributions to modern medicine [11].

Al-Zahrawi has also pioneered many diagnoses in the field of neurosurgery and neurology. He is known that he diagnosed and applied surgical treatments for head traumas, skull fractures, hydrocephalus, subdural effusions, spinal injuries and migraine [4]. He described a surgical procedure for ligation of the temporal artery in migraine. His narratives about the anatomy of the brain regarding neurosurgical operations inspired many neuroscientists at that time and later [8].

He cleverly devised methods in colorectal surgery and modeled them in modern surgical procedures [1]. He recommended cauterization for cleft lip treatment in children to close with fibrosis and scarring [2]. He applied cauterization for the ligation of arterial aneurysms. He is known as the first surgeon to use arterial ligation to stop bleeding. He also applied the method of connecting testicular veins to treat varicocele. He performed amputation to treat limb gangrene. He designed an anesthetic sponge for the first time [3]. The use of catgut invented for internal suture in surgical operations is applied in modern surgery. Al-Zahrawi was the first to treat warts with various cannulas. Al-Zahrawi invented forceps in vaginal delivery and for removing a dead fetus [7].

Al-Zahrawi is known to describe many diseases such as hemophilia, ectopic pregnancy and gynecomastia and focus on their treatments [2,7]. Al-Zahrawi proved that a cut in her throat can heal by treating a slave girl who cut her own throat in a suicide attempt, and gained the experience that a laryngotomy is not dangerous [4]. It is also known that he performed tracheostomy and lithotomy at that time [5].

He treated the hemorrhoids with non-invasive methods. He identified chronic constipation as the cause of the fissure, and suggested flushing the fissure with warm water and applying topical ointment to speed healing. Identified risk factors for hernia and prescribed fast-acting laxatives [1].

It is known that Al-Zahrawi treats inguinal hernia surgically but cares about postoperative care against the side effects of the surgical procedure [12]. He achieved success by identifying neurological symptoms of leprosy [11].

Conclusion

Al-Zahrawi contributed greatly to the advancement of Western European surgery, modern medicine and thus care services. Al-Zahrawi has brought new perspectives and solutions to the diagnosis and treatment of the disease not only in the field of surgery but also in neurology, orthopedics, gynecology, ophthalmology, neurosurgery, and general surgery. In addition, al-Zahrawi stands out with his educator identity outside of medicine. Apart from being a good scholar and psychiatrist, he worked in agriculture, pharmacology, chemistry and cosmetics. Al-Zahrawi is known as the father of modern surgery and the head of all surgeons. Although the term Father of Surgery is attributed to a few people, Al-Zahrawi was a surgeon who deserved this title.

He invented many instruments that were not previously known in Europe, such as surgical applications and double-ended hooks, forceps, catgut, which are still used in modern surgery [4]. Al-Zahrawi's greatest contribution to science was his work called "et-Tasrîf limen Aceze an'd-Taalif". In this book of Al-Zahrawi, he introduced more than 200 cutting and piercing surgical instruments such as scalpel, retractor, rake, pincer, specula, which he described visually. These instruments also included a class surgical instrument for cauterization and binding style.

The experience, teachings and principles of Al-Zahrawi, a pioneer in modern medicine and plastic surgery, continue to inspire the diagnosis and treatment of medicine today.

References

1. Nouri-Vaskeh M, Mostafavi S, Alizadeh H, Kazemi A. Albucasis: Pioneer of the modern anorectal surgery. J Coloproctol (Rio de Janeiro). 2020;40(4):435–9. https://doi.org/10.1016/j.jcol.2020.05.016.
2. Asaad M, Rajesh A, Zazo A, Banuelos J, Kaadan A. Albucasis: A pioneer plastic surgeon. Ann Plast Surg. 2019;83(6):611–7. https://doi.org/10.1097/SAP.0000000000002023.
3. Zarrintan Sina, et al. Abu Al-Qasim Al-Zahrawi (936–1013 AD) icon of medieval surgery. Annals of Vascular Surgery. 2020;69:437–40. https://doi.org/10.1016/j.avsg.2020.07.012.
4. Atir A. The forgotten greatest surgeon. Acta Sci Pharmacol. 2020;1(7): 26–9.
5. Edriss H, Rosales BN, Nugent C, Conrad C, Nugent K. Islamic medicine in the middle ages. Am J Med Sci.2017;354(3):223–9. https://doi.org/10.1016/j.amjms.2017.03.021.
6. Demir M. The translation activities of andalus period. Eur J Literature, Lang Linguistics Studies. 2017;1(1). https://doi.org/10.5281/zenodo.837843.
7. Butt Iqra. Brief introduction of Az-Zaharawi's contributions in science. Int J Pathol. 2018;15:38–41.
8. Unel CC, Ozden H, Ulupınar E. Abulcasis: Neurosurgical contribution to history. Anatomy. 2019;13(1):76–7.
9. Bakir A. Medicine and the interaction period in the European middle ages. J Middle Ages Studies. 2018:1(1):101–18.
10. Koc O. Libraries of Andalusian and contributions to scientific knowledge production. World Knowledge. 2018;19(2), 297–323. https://doi.org/10.15612 /Bd.2018.674.
11. Taheri Akerdi A, Rouhezamin MR, Bahmani Kazerooni MH, Paydar S. Albucasis insights in trauma management. Res Hist Med. 2019;8(1): 57–64.
12. Taheri Akerdi A, Bahmani Kazerooni MH, Rouhezamin MR, Fazelzadeh A, Paydar S. Hernia repair in golden Islamic era; review of Albucasis (Al-Zahrawi) methods in hernia repair. Res Hist Med. 2019;8(2):123–8.