

SURGERY IN THE MEDIEVAL MUSLIM WORLD

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The knowledge of surgery is as old as is the pre-historic man. The man used to check the bleeding from the wounds in those days by pressing the two edges with the fingers or by sucking at the wounds.

In the middle ages the medicine was greatly influenced by the Greeks, because they were the only Physicians of the time. As a legacy it developed among the Christians and Arabic milieu. The geographical situation of Arabs in Asia Minor close to Greece provided them the opportunity to know old Greek authors specially of the Philosophy and Medicine.

In Asia Minor we have a series of contributors to the field of medicine and surgery who wrote their own experiences about the surgical problems they had to face while practising. They are Aetus Amidenus of Mesopotamia (beginning of 6th century A.D.) who made a valuable compilation of the work of ancient authors and also wrote a text book which shows clearly that how the physicians of the period faced the surgical problems. He has specifically described the methods of extraction of teeth and treatment of fistula of the gums in detail.¹

After Aetus came Alexander of Tralles who lived in later part of 6th century A.D. He used to practise medicine in Rome. He had expressed the results of his studies and practical experience of the medical practise in the form of a book, in which at certain places he has differed from Galen. His techniques show that he was a rational and observant practitioner. The third of these great writers was Paul of Aegina who flourished in 7th century A.D. He is the best known of these Byzantine physicians, who studied at school of Alexandria and was especially eminent in surgery and midwifery. His reputation was so high that the Arab-midwives used to call him for help in certain complicated cases though in those days males were not allowed to treat the obstetric cases.

According to James, J. Walsh (1920), it was the teachings of these Byzantine physicians and surgeons that aroused the muslim scholars from apathy that cha-

racterized the attitude of the Arabs towards science at the beginning of Mohammada-nism (Islam).

Around 640 A.D. a school was built in Baghdad in East and at Cordova in West. Arabs took maximum interest and patronized the medicine by establishing various schools, hospitals and libraries. In East The Academy of Baghdad was founded by the Caliph Haroun-al-Raschid in 9th century where a big library was founded and the works of the Greeks were translated and studied.

In the beginning of the 7th century A.D. the Arabs started taking interest in surgery, but because of the religious binding, they could not dissect the dead bodies for the knowledge of anatomy, so their knowledge of anatomy was not much advanced. Whatever, anatomy they knew, was by the dissection of the animals or by the translated books of Galen.

There were various scholars of the period, who used to translate the Greek Medical Literature into Arabic, a few of them who are thought to be the pillars of Unani Medicine are, Yuhanna Ibne Masawayh (Mesue Senior) 777-857, Abu zajd Hunain-bin-Ishaq-al-Ibadi (Johannituis) 809-975, Hubaysh-ibne-al-Hasan, Isa b. Yahya and al-Rahawi.²

Amongst them Yuhanna Ibne Masawayh was the first medieval educators in Islam who emphasized the value of study of anatomy for the practitioners. His book *Kunnash-al-mushajjar* is the first illustrated medical text.

Hunain bin-ishaq-al-Ibadi was another translator, who used to translate the medical books of Greeks in Arabic by the order of the Caliph Haroon-al-Rashid. Hunain was a Nestorian Christian. He was awarded gold equivalent to the weight of each book translated. His role in the spread of surgery in Islamic period was of immense importance, because he was the first person to translate works of Hippocrates and Galen into Arabic, he was well equipped with the knowledge of Greek and Arabic and thus he could freely and accurately express the sense of Greek text into Arabic. Since the Greek original literature has been lost, the Hunains Arabic translations are the only authoritative sources of medical literature of the Islamic period.

In addition, Hunain had his own independent work on ophthalmology. His book *Kitab-al-ashr-maqalat-Fil-Ain* includes 20 chapters on anatomy and physiology of the eye with proper illustrations.³

As far as the practice of surgery is concerned, Arab physicians and surgeons of fame are: Rhazes, Avicenna, Albucasis and Avenzoar. During 9th century and 10th century A.D. the Arabs remained the most important contributors to medicine and surgery.

The first of the Arabic writers to write comprehensively about surgery was Ali-ibne-Abbas Al Majusi (10th century A.D.) from Ahwaz in Persia. His book *Al-Kitab-al-Maliki* was devoted to surgery. His description of Catheterization in this book is as follows:

“Choose a catheter of proper size, lubricate it well, introduce it in the urethral meatus with the penis straight up, until it reaches the root of the penis, bend up the penis and pull it towards the umbilicus as the canal to the bladder is bent at its root. Push the catheter as far as it goes and then turn the penis quickly down towards the rectum and push the catheter into bladder.”¹

His description of the removal of a cyst is as follows:

“Incise the skin very gently until you reach the sac, trying not to cut the sac. Take hold of the sac with the hooks, which an assistant should hold. Dissect the sac gently taking care not to open it and try to remove the whole cyst with the sac intact. If the sac is torn, hold it with the hooks and remove it in piecemeal. If any piece remains, it should be cauterized thoroughly, for if any part remains, the cyst will recur.”⁵

According to Al-Majusi the tubercular glands should be operated if not treated by medicines.

The gravity of the cancer was well recognized in his description of operation for removal of superficial cancers. He advises complete removal of the tumor with a large border of clear skin. He had given a very clear description of the tumors of breast and uterus and their surgical treatment.⁶

His book *Al-Kitab-Al-Maliki* written in 10th century had 20 chapters, the 9th chapter of this book deals with the surgical treatment. He has described the different forms of incision, venesection, operative steps of removal of aneurysm,⁷ drainage of abscesses, extraction of arrows, surgical treatment of hydrocephalous, repair of lids, removal of nasal polyps, excision of epulis, extraction of teeth, tonsillectomy,⁸ tracheostomy, aspiration of ascites, repair of umbilical and inguinal hernia, operation of piles, imperforated anus, fracture and dislocations, especially fracture of mandible,⁹ fracture of the clavicle, fracture of shaft of femur and the treatment, amputation of the limbs and the fingers.

His description of some of the operations need no addition even today. Thus for example the treatment of aneurysm according to *Al-Kitab-al-Maliki* is as follows:

“An aneurysm is a swelling in the artery due to the puncture or cut in it, but without cutting the skin. The steps of operation are as follows:

“Cut the skin longitudinally over the swelling, expose the artery freeing it from all the surroundings and pull it up with a hook, pass a needle with a linen thread under one end and tie it, cut the thread. Do the same thing on the other side. Excise the swelling and stitch the skin.”¹⁰

Another such example that can be cited is that of the operation of tonsillectomy.

“Have the patient sit opposite you facing the sun and order him to open mouth. Order one servant to hold the head of the patient from behind and another servant to press down the tongue with a tongue depressor, pull out the tonsil with a hook as far as possible without pulling out with it any of the membranes or structures near it, cut the tonsils out from its roots with proper scissors, then cut out the tonsils on the other side. Stop the bleeding if there is any.”¹¹

The Arabs were good orthopaedists also. Al-Majusi has described the treatment of fracture of lower jaw in detail:

For fractures of jaw on the left side, put the middle and index fingers of your left hand inside the mouth and with the right hand on the outside, reduce the fracture, you know that the fracture is reduced by return of the teeth to their natural level. If the fracture is complete and the fragments are twisted, use extension, counter extension and manipulation with the help of a servant until the fracture is reduced then you should immobilize the fragments by a gold or silver wire tied around the teeth to keep the fragments in position. If you have no gold or silver wire, use well twisted linen thread¹² and then apply bandage.

The other surgeon of the late medieval period in the Muslim world was Abu-Bakr-Mohd, Ibne Zakaryah al Razi (850-923 A.D.) who is famous by the name of Rhazes. He has described the methods of stitching of wounds and use of silk thread and catgut. He was the first person to use alcohol for cleaning of the surgical wounds. He carried out the operation of a cataract successfully. He had done tracheostomy on a patient named Wazir Ahmad Ibne Ismail, who was suffering from diphtheria. The steps of operation of tracheostomy are very clearly described in his book named *Al-Hawi*.¹³ He had described a method of reduction of shoulder dislocation named as Arabian method.¹⁴ According to some historians the book *Al-Hawi* is a work compiled by the pupils of al-Razi from his unfinished notes.¹⁵

According to Friend, *Al-Hawi* is the work taken chiefly from Aetus and Paul of Agina.¹⁶

The greatest of the Arab surgeons was Abu-al-Qasim Khalaf ibne-al-abbas al-Zehrawi known as Albucasis. He flourished in II half of 10th century A.D. His book *Al-Tasrif Li man ajza an al Talif* established his fame not only as the best surgeon

produced by the Arabs but also as one of the best surgeons during the medieval period. The most important part of the book is the last section dealing with surgery. He used cautery frequently and used it for opening the abscesses and removal of cancerous growth. He preferred cauterization to incision in cases of liver abscess and cancers. In the beginning of this book Albucasis had stated that knowledge of anatomy is the basis of surgery. Though the dissection of the dead body was prohibited in those days but Albucasis strongly recommended dissection of dead body as essential to surgery.

The unique part of his book are the figures, about 200 in number, of the surgical instruments used in those days. A majority of these instruments, which he has drawn and recommended were personally devised by him and used on his own patients. The surgical part of his book was translated in Latin by Gerard of Cremona and was used as a text book in European Universities up to 18th century A.D.

He was the first man to teach the methods of vaginal lithotomy¹⁷ (removal of bladder stone through vaginal route).

Albucasis has described the oral and dental surgery in detail. He used to do the filling of carious teeth and even replaced those, which were lost, by the teeth of other persons or artificial denture made of ox bone, which were fixed in places by fine gold ligatures. He corrected the deformity of dental arches. He had a full set of sharp and fine instruments made of metals, e.g. pincers for removal of foreign body from the ear, concave scissors for tonsillectomy, forceps and hooks, ear syringe, tongue depressor etc.¹⁸

Indeed Albucasis was the first to write on treatment of deformities of mouth and dental arches.¹⁹ He performed transverse tracheostomy in one of his servants, and reported it as a successful operation. He did litholapaxy, even cranioclasty was performed by Albucasis for large foetal head. He used to treat fracture of pubic arch by introducing sheep's bladder into vagina and filling it with air for support. In those days the bladder of animal was used for a great many purposes for which the rubber bags are used today.

In 980 A.D. another Arab was born who later became a very famous physician of the contemporary world. He was famous by the name of Avicenna. He was given the honour of Sheikh-ur-Rais and is remembered today as Sheikh-ur-Rais Bu Ali Ibne Sina. He deserves the credit for introducing the treatment of lachrymal fistula by probing. He preferred dry dressings in comparison to wet and pointed out that the healing was hastened by dry method. In his book *Al Qanoon* known as "Canon of Avicenna", he has stressed the importance of complete and thorough removal of tissues and all blood vessels of the affected part with its adjoining area as the treatment of cancer but he has stated that he was not satisfied even with this form

of treatment in cases of cancer. This book contains 5 volumes, III, IV and V chapters of the fourth volume deals with surgery.

In addition—he has done tracheostomy, tonsillectomy, dental and other oral surgery.²⁰

In the 12th century A.D. Ibne Zohr (1072-1162) famous as Avenzoar was the first man to suggest nutrition per rectum. His apparatus for the purpose was consisted of the bladder of a goat with silver cannula, fastened into its neck. After having cleaned and washing of rectum he used to inject the nutrients per rectum. The nutrition by rectal route was first given to a patient of stricture of oesophagus. He used to pass silver cannula into oesophagus for pouring milk in cases of oesophageal growth.²¹ In addition he had done ophthalmic and oral surgery successfully.

The last of the Arabic writings on surgery was by Ibne-al-Quff. His book *Al Umdah Fi Sinnat al Jarraha* contained 20 sections on surgery,²² and was written in 1356 A.D. This book was the first comprehensive and independent work on surgery for the students of medicine and practitioners of those days.

These men placed the practise of Medicine on the dignified level of a profession, but succeeding centuries have not obliterated entirely the superstition that they condemned. During the period of Arab domination surgery was a despised art in Europe and surgeons were looked upon as unclean. The surgery was in the hands of barbers and butchers etc., but to-day the surgery is the best art and is in the hands of the handsome surgeons.

REFERENCES AND NOTES

¹Dana, Charles, L., *The Peaks of Medical History*, 1927, p. 47.

²*Tarikh-ul-Hukama'*, Vol. I, p. 255-380.

³Campbell, Donald, *Historiography of Islam*, Vol. I, 1926, p. 43.

⁴Al Majusi, *Al-Kitab-al-Maliki*, Vol. II, p. 483.

Catheterization—a technique of draining the urine from bladder with the help of a catheter in cases of retention of urine.

⁵*Ibid.*, Vol. II, p. 467.

⁶*Ibid.*, Vol. II, p. 467-468.

⁷*Kamil al Sannat*, Vol. II, p. 462.

Hydrocephalous (hydro=water; cephalous=skull)—a congenital anomaly in which the size of skull of the infant is increased.

Aneurysm—a localized dilatation of blood vessel in the form of a tumor.

⁸*Kamil al Sannat*, Vol. II, p. 479.

⁹*Al-Kitab-al-Maliki*, Vol. II, p. 504.

Epulis—a tumor arising from the gums.

Tonsillectomy (ectomy=removal)—an operation of removal of tonsils.

Tracheostomy (ostomy=making an opening)—an operation in which an opening is made in the trachea to facilitate respiration in cases of respiratory obstruction.

Imperforated anus—a congenital anomaly in which the anal opening is not formed or covered by a thin membrane.

Ascitis—a condition in which the fluid is collected in the peritoneal cavity (abdomen).

¹⁰*Kamil-al-Sannat*, Vol. II, p. 462.

¹¹*Ibid.*, Vol. II, p. 479.

(Orthopaedist—the surgeon who deals with the diseases relating to bones and joints.)

¹²Al-Majusi, *Al-Kitab-al-Maliki*, Vol. II, p. 504.

¹³Siddiqui, M. Z., *Studies in Arabic and Persian Medical Literature*, 1959, pp. 14-22.

¹⁴Khairallah, A., *Outline of Arabic Contribution towards Medical Sciences*, 1946, pp. 137-138.

¹⁵Neuburger, M., *History of Medicine*, Vol. I, 1910, p. 361.

¹⁶Friend, *History of Physick*, Pt. II, p. 49.

Catgut—a special type of thread prepared from the inner-most layer of the intestine of sheep (kitten) which has a self-dissolving property.

Cauterization—a technique of burning the tissue locally with the help of chemical or by electrodes.

¹⁷Leclere, L., *Histoire de La medicine arabe*. Vol. II, p. 456.

¹⁸Walsh, James J., *Medieval Medicine*, 1920, p. 138.

¹⁹Spencer, H., *Lancet*, 1912, Vol. I. p. 1568.

Litholapaxy—a technique of crushing the urinary stone.

Cranioclasty—a technique of crushing the skull of foetus in cases of very large head.

²⁰*History of Dentistry*, Philadelphia, 1907.

²¹Walsh, James, J., *Medieval Medicine*, 1920, p. 77.

²²*Ussay biyah*, Vol. II, p. 273.