

## Historical Perspective

# History of Arab Surgery

## Part One—General Consideration

There is a temptation for the European historian, after he has given an account of invasions by Germans and Slavs, Magyars and Norsemen, to think of the Islamic conquest of Spain, Sicily, and Constantinople as a comparable "Barbarian" invasion<sup>1</sup>. Such temptation to equate Muslims with others must, if truth is to prevail, be sternly repressed, because it is a big fallacy. There is an essential difference. The other invaders belonged to societies organized on a tribal basis and had never known the culture and sophistication of urban developments; they had to invade in order to prey on and expand at the expense of others. The Muslims, on the other hand, were representatives of an empire which for two centuries were the bearers of the highest culture and civilization of the world; it was their pervasive religion which inspired them to spread the word of Islam.

As a consecutive outcome of this **fallacy in history**, another **fallacy** appeared in **science**, namely the denial of any Muslim contribution to science. Indeed, Arab achievements in science were viewed with prejudice and subconscious denigration by most European scholars; so much so, that even some of those who praised Arabs, did so grudgingly, and portrayed them as mere preservers, cultivators, and transmitters of Greek knowledge, or as they phrased it "pupils of the Greeks"<sup>1,2</sup>. In fact, when a contemporary scientist embarks on an enterprise, he must review and delve into the wealth of past literature to sample and benefit from the experience of others in order to provide credibility to his original work and dissertation.

Only few unbiased authors were able to acknowledge the Arab original contribution to medical sciences<sup>1,3,4</sup>. However, Arabic surgical art and knowledge, technical inventions and operative innovations were still shrouded in mystery; they surprisingly, skipped the observation of many

historians wittingly or unwittingly. It may be, appropriate here, to reiterate Montgomery Watt's saying:

**"for our cultural indebtedness to Islam, however, we Europeans have a blind spot. For the sake of good relations with Arabs and Muslims we must acknowledge our indebtedness to the full. To try to cover it over and deny it is a mark of false pride<sup>1</sup>.**

The original manuscript is an attempt to bridge this gap; it provides an historical outline of Arab surgery, revealing for the first time in English literature, the remarkable achievements of Arabs highlighting their genial contributions in surgical sciences.

## HISTORICAL EVOLUTION— AN OVERVIEW

The **Babylonian Code of Hamurabi** written as early as 2250 BC represents the first documented reference to surgery in the history of mankind; it states that reckless surgery must be punished by cutting off the surgeon's hand as punishment. It is inconceivable that any surgeon can perform operations in such an hostile environment. **Egyptians** were shown performing the operations of circumcision, castration, wound and abscess surgery and limb amputation. Unfortunately, they had rudimentary knowledge of body structures and abdominal contents in spite of their interest in embalming<sup>5</sup>.

**Greeks** made valuable contributions to anatomy, but they did not dissect the human body, because their religion was even more hostile than that of the Egyptians toward any interference with the bodies of the dead. The great Greek physician of Pergamon, **Galen**, who lived in the 2nd century after Christ (131-201 AD), derived his

knowledge of anatomy from the pig, the ape, the dog, and the ox. He assumed that the structures he found in these animals were identical with the structures in the human body. For many centuries, the human breastbone was supposed to be segmented like that of an ape; and the liver to be divided into many lobes like that of a hog; the uterus was supposed to be two long horns as in the dog; and the hip bones to be flared as in the ox<sup>5</sup>. Galen also believed in small invisible pores between the ventricles of the heart.

Galen's authority forced generations of doctors to apply his knowledge of animal anatomy to human beings. When the seats of learning fell into the hands of the Church, his writings became like Gospels and bore the stamp of the Church's authority and infallibility. Such was the hold of Galen's work upon the clerics and physicians of the Middle Ages. No one dared to say otherwise until **Arabs and Muslims** through their observations and cadaveric dissection reviewed the human anatomy as we know it now. **Vesalius** thereafter, through his Arabic teaching and education was able to popularise and publish their observations with his own in his famous book on the structures of the human body (vide infra).

**Arab surgery** encompasses all Muslim (non-Arab), Arab (non-Muslim), and Arab Muslim practitioners who speak the Arabic language and who flourished in the Islamic Arabic Caliphate (Empire) based mainly in the "Middle East" but including parts of Persia, Asia, North Africa, and the Iberian Peninsula. Their practice is referred to sometimes as "**Arabic Medicine**" and sometimes as "**Islamic Medicine**"<sup>3,4</sup>.

Arab metamorphosis and cultural rise to a scientific creative nation did not come about suddenly; it passed in 3 distinctive phases, namely:

### 1. Tentative Beginnings (Literature Review and Translation of Greek Books into Arabic

In 431 AD, when Nestorius, a patriarch of Byzantium, was banished for heresy, he fled to Southwest Persia where he and his followers founded a school. For 2 centuries, the Nestorian Christians preserved and translated Greek manuscripts (including those of Aristotle and Hip-

ocrates) into the Syriac language<sup>6</sup>.

The medical school in **Gondeshapur** (now Shahabad) had been founded by the Sassanian ruler Khosrow I, Anushirawan (531-579) in pre-Islamic times. **Al-Harith Ibn Kalda**, the legendary friend of Prophet Mohammad, and also a Nestorian Christian, who had lived into the reign of the Umayyad Caliph Mu'awiya (661-680), may well have come from here. The tradition of doctors of Gondeshapur was to be revived again a few generations later under the Caliphs<sup>7</sup>.

Greek scientists had captured the Caliphs' imagination long before their Islamic expansion, to the extent that they were persuaded in 830 AD (by the Romans) to halt their military campaign in return for the acquisition of Greek books kept in Byzantian underground tunnels. Abbasid Caliphs themselves, were the patrons and promoters of medical activities.

The famous doctors of the time: **Jurjis Ibn Jibrail, Yuhannah Ibn Masawayh and Hunayn Ibn Is'haq Al-Ibadi**, on the special request of successive Caliphs in Baghdad—**Abu Ja'afar Al-Mansoor** (754-775 AD), **Haroun Al Rashid** (786-809 AD) and **Al-Mamoon** (813-833 AD) respectively—undertook the difficult commitment of translating Greek medical books and the Syriac versions of Greek books into the Arabic language on an unprecedented scale in history. Doctors of the **Bukht Yishu** dynasty, who were Nestorian Christians, became leaders in the translation from Syriac into Arabic; for more than 200 years, from the time of Al-Mansoor, the members of this family were personal physicians to the Abbasid Caliphs in Baghdad and Samarra. Each of the translators was offered the equivalent weight of the book in gold. Latterly, Caliph **Al-Mamoon** ordered a School of Translation to be attached to the Academy of Baghdad, called "**Baytul Hikma**" (**House of Wisdom**) and appointed **Hunayn Ibn Is'haq Al-Ibadi** (808-873 AD) as its head. The latter, for instance, translated **Galen's books**: "**On Anatomical procedures**" (**Fi Aamal Al-Tashrih**) of which the original Greek books volumes IX and XV were totally lost—"On Examinations By Which The Best Physicians are Recognised" (**Fil-Minha Allati Yurafa'u Biha Afadil Al-Atibba**), and "**The Best Physician Is A Philosopher**" (**Fi Anna Al-Tabib Al-Fadil Faylasuf**). Ironically, many of

original Greek books were lost, and it was the Arabic version which preserved the Greek knowledge. It was said that the Umayyad Caliph Al-Hakim II (961-976), the greatest bibliophile of the Islamic World personally collected and catalogued 400,000 volumes in his library in Cordova; his agents travelled with the trade caravans to purchase the scientific manuscripts of the Western World<sup>8</sup>.

In a short spell, the social fabric of the Islamic society had changed so that the 3 most prosperous professions after Amirs, Scholars and Doctors became the **Translators (Sin'at Al Nakkaleen)**, **Calligraphists (Sin'at Al Khattateen)** and **Dealers of Paper industry (Sin'at Al Warrakeen)**.

## 2. Original Contributions

Perhaps, the most important Arab contribution was the foundation of surgical practice on solid scientific basis relying heavily on personal observations, clinical studies as well as animal experimentation; they condemned superstitions and ill-practices based on mal-experience.

The work of **Yuhannah Ibn Masawayh** on dissection for instance, was given a great deal of veneration by Caliph **Al-Mutasim** around 830 AD, who was so interested in **Yuhannah's** work that he made a special dissection hall available for **Yuhannah's** use on the Tigris river bank and provided him with apes specially brought for him from Nubia in Africa<sup>9</sup>.

**Rhazes or Abu Bakr Al-Razi** (860-932 AD) studied medicine in Baghdad and practised in Persia (Rayy). Having established name and fame, Rhazes returned to Baghdad to become the head of its newly founded **Al-Mu'tadidi Hospital** named after Caliph **Al-Mu'tadid** (892-902 AD). He wrote voluminously and described a primitive suture in his medical encyclopedia "**Al-Hawi Fil-Tibb**" (**Continens in 23 volumes**). He was reputed to be the first surgeon to stitch abdominal wounds in man, using harp strings made of spun strands, possibly cut from animal intestine<sup>10</sup>!

**Haly Abbas Al-Majusi** (?-994) in his famous book "**Kamil Al Sina'at or Al Kitab Al Malaki**" (**Liber Regius in 2 volumes**) dedicated a whole section to surgery which was considered to be the first authentic piece in the Medical Literature. He therefore, established a milestone in the history

of surgical sciences. Haly Abbas was the first Muslim surgeon to describe the blood movement and general circulation in some detail, and although he fell into the trap of the Galenic concept of invisible pores between ventricles of the heart, his views represented a breakthrough in science at that time. He was also the first doctor in history to describe the capillary connection between arteries and veins<sup>11</sup>.

**Avicenna** (980-1037 AD) was a famous physician and a great anatomist. He wrote "**Al-Canon Fil-Tibb**" (**The Law of Medicine in 3 volumes**) which lasted for centuries as the medical textbook, albeit translated later into Latin. He was one of the first doctors to illustrate the human vessels. **Avicenna**, however, accepted Galen's concept of blood passage via invisible pores<sup>12</sup>.

**Al-Zahrawi or Abulcasis or Albucasis**, the father of operative surgery (936-1013 AD) (Andalusia-Spain) was the first to operate on blood vessels. He invented the animal gut suture and used it for the first successful intestinal anastomosis reported in the literature. He also commented on the extensive vascularity of the jejunum, documented the possible spontaneous healing of faecal fistulae and described more than 100 surgical instruments in his book "**Al-Tasreef**"<sup>13</sup>.

When **Saladin's** armies returned from Acre to Jerusalem to sign a peace treaty with the Crusaders (1192 AD), his special doctor, **Abdul Latif Al-Baghdadi** collected as much as he could of the writings of the Ancients and showed them to **Saladin** who immediately ordered a Study Grant to be paid to **Abdul Latif** during his sojourn in Damascus. After **Saladin's** death, **Abdul Latif** left for Cairo to lecture. There, he witnessed the famine that ravaged the population in 1199-1202 AD and had the unique opportunity of examining thousands of bodies of people who had died of starvation. The results of his anatomical studies were published in his book "**Notification and Considerations of Observed Matters And Inspected Occurrences In the Land of Egypt**" (**Al-Ifada Wal Itibar Fil Umur Al-Mushahada Wa-Hawadith Al-Muayana Bi-Ardi Misr**) which he completed in 1207 AD. He described the structure of skeletons and reviewed the human anatomy. He corrected Galen on the structure of the lower jaw concluding that it consisted of one piece, not two as **Galen**

had claimed in his book "On Anatomy of Bones" (Fi Tashrih Al-Izam)<sup>8</sup>.

**Ibn Al-Nafis** (Damascus-Syria) in 1288 AD, however, opposed both Avicenna and Galen vehemently on their concept of blood passage through invisible pores. He described the circulation of blood from the right ventricle into the lungs for purification prior to its return to the heart for redistribution. He was, therefore, the first to describe the "Pulmonary Circulation" (based on personal anatomical observations during actual dissection). He also discussed the systemic circulation vaguely in his book "The Synopsis of Dissection in the Law in Medicine" (Shar'h Tashreeh Al-Canon)<sup>14</sup>.

**Ibn Al-Nafis' contemporary Ibn Al-Quff** (1233-1286 AD), in his book "Kitab Al Omda fi Al Jiraha" (The Book of Mastery in Surgery in 2 Volumes), gave the most comprehensive description of surgical operations and treatment of bodily injuries ever contained in any Arabic text of its kind. He explained the function of the capillaries reiterating and consolidating Haly's views; he was the first doctor to discuss the uni-directional action of valves in veins and in heart chambers. He also made the first appeal for uniformity of standards for weight and measures used in Medicine, Pharmacy and Surgery<sup>15</sup>.

## References:

1. WATT W M: The influence of Islam on Medieval Europe. Islamic Surveys No. 9. Edinburgh at the University Press. Reprinted paperback edition, 1987.
2. CROMBIE A C: Augustine to Galileo, The History of Science AD 400-1650. London: Falcon Educational Books, 1952; pp23-30.
3. BROWNE E G: Arabian Medicine. Cambridge at the University Press, 1921.
4. ULLMANN M: Islamic Medicine. Islamic Surveys No. 11. Edinburgh: the University Press, 1978; pp34-35.
5. HAGGARD H W: Devils, Drugs, and Doctors. London: W Heinemann (Medical Books) Ltd, Undated. pp127-131.
6. SKINNER H A: Anaesthesia and Arabic Words. In "The

- Origin Of Medical Terms" (2nd Edition). Baltimore: The Williams & Wilkins Company. Pp25,38-39.
7. BRANDENBURG D: Islamic Miniature Painting in Medical Manuscripts. Basle, Switzerland: F. Hoffman-La Roche & Company, 1982; pp7-29.
8. AL-FALLOUJI M A R: Historical Introduction. In "Colorectal Vascular Patterns in Health and Disease". "PhD" Thesis. Royal Postgraduate Medical School / Hammersmith Hospital, University of London, 1988; pp33-53.
9. IBN ABI USAYBIA (1269-1303): Uyun Al Anba Fi Tabaqat Al Atibba (News Eyes on Doctors Classification). Beyrouth: Dar Maktabat Al-Hayat, (before 1290) recently printed (no date). pp254, 414-427 (in Arabic).
10. RHAZES': Liber Continens (Kitabul Hawi Fi't-Tibb) in 23 volumes. Volume IX. On the Diseases of the Uterus, Gynaecology and Midwifery, Edited by the The Bureau based on the unique Escorial Ms. (Nos. 810 & 813), Madrid. Hyderabad Al-Dakan, India: Dairatul Ma'arifil Osmania, 1961; pp127-163 (in Arabic).
11. HALY ABBAS (Ali Ibn Abbas Al-Majusi). Kamil Al Sina'at or Al Kitab Al Malaki (Liber Regius) in 2 volumes. Undated and unknown publishers, the manuscript is present in Damascus and Beyrouth Reference Libraries.
12. AVICENNA (Abu Ali Al-Husain Ibn Abd Allah Ibn Sina). Al-Canon Fil Tibb (3 volumes). New reprint by offset from Boulak edition. Beyrouth: Dar Sadir. Undated.
13. ALBUCASIS: On Surgery and Instruments. A definitive edition of the Arabic text with English translation and commentary by M S Spink and G L Lewis. London: The Wellcome Institute of the History of Medicine, 1973; pp476-500.
14. IBN AL NAFIS: Synopsis of Dissection in the Law of Medicine (Kitab Shar'h Tashreeh Al-Canon) in one volume. Reviewed by Salman Kataya and Paul Gallionji. Cairo: Al-Hai'a Al-Mas'riya Al-Amma Liiktab, 1988 (in Arabic).
15. IBN AL-QUFF: Kitab al-Omda Fil Jiraha (2 volume). Hyderabad Al-Dakan, India: Dairatul Ma'arifil Osmania, 1356 A.H. pp127-163 (in Arabic).

## The Author

M AL FALLOUJI, PhD(Lon), FRCS(Ed),  
FRCS(G), FRCSI  
Assistant Professor  
Department of Surgery  
UAE University, P O Box 17666  
Al Ain, United Arab Emirates