Surgical, medical and anesthesia in the Middle East: Notes on Ancient and medieval practice with reference to Islamic-Arabic medicine

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Citation

Abstract
In the Middle East, historians consider that the world civilization, started along the major rivers, namely the Nile valley and in between the rivers Euphrates and Tigris in the land of Mesopotamia 4000 years ago. The oldest medical writings are found in cuneiform tablets, which is known as the oldest medical handbook, and in Ancient Egypt in medical pyperi, Especially Eber pyperus. Both texts (the tablets and pyperus) contain medical text describing the surgical, medical and herbal treatments. The Assyrians herbal contained: Belladonna, Cannabis and Mandragora. The Ancient Egyptians used opium poppy and influenced the Greek medicine. Indian and Chinese influences and later on Alexandrian medicine influence the teaching of medicine to lesser extent. Both the Assyrian and Egyptian physicians obtained artificial sleep for their patients by quickly compressing the Carotid vessels of the neck, this practice was followed as well by the Greek physicians. Arabic translation of the Greek medicine helped to make Islamic physicians supreme in the middle Ages. Baghdad became the world's leading medical and drug center. With the skill of the Arab Alchemists, the art of drug making began to evolve into the science of Pharmacology. Western physicians emerging from the Middle Ages found the Arab pharmacopoeia (based on the Greek and enriched by Arab herbs), in which a list of medicinal plants composed the anesthetic armamentarium of our forefathers. Ibn al Nafis (1208-1288) the Arabic scholar who described the pulmonary circulation, mentioned in his book Al Shamel a paragraph on how patient could be restrained during surgery and his remarks do not mention anesthesia. The reason may be that he worked as ophthalmologist. His pupil Ibn Al Koff (1232-1286 AD) wrote a complete chapter on pain relief in his book "Al Omdah Fi Sinaat Al Jirahah". He differentiated between true and non-true pain relief considering non-true pain relief the “Anesthetic” which the surgeon may use for treatment of pain or to be able to institute the surgical treatment. The method mentioned by some historians regarding anesthetic sponge (the predecessor of inhalational anesthesia) may need further documentation and research to elicit its mode of action, and the extent of its use.

DEDICATION AND ACKNOWLEDGEMENT
This review is considered a cumulative summary of relevant information on the positive contribution of Arabic-Islamic scholars of the middle Ages to medicine. It is cumulative work compiled by many distinguished scholars of the contemporary Arab world. I specially mention the major drive of Prof Anis Baraka who is the “Dean” of Arab Anestheiology, seen in the picture receiving his second Medal of Lebanon President for his contribution to Anesthesia in Lebanon Given to his by his Excellency Dr Karam Karam who was then (2000) Minster of health. [1]
The second the “Dean” of medical historian in the Middle East the Editor of History section in the Middle East Journal of Anesthesiology pictured with his lady wife and Prof. Baraka in last world congress of anesthesia in Canada (2000)

Surveying the ancient history of healing art indicates that world civilization started along the major rivers of the Middle East, namely the Nile valley and in between the rivers Euphrates and Tigris in the land of Mesopotamia 4000 years ago. From these lands surgery in various primitive forms were known. The oldest medical writings are found in cuneiform tablets which is known as the oldest medical handbook from Mesopotamia and in Eber pyperus from ancient Egypt. Both (the tablets and pyperus) contain medical text describing the medical and herbal treatments. In the one of the temples of “Kom Ombo”, instruments of surgery and operating on awake, standing patient was noticed.
Figure 3
Figure 1: Replica of picture on the wall of Ancient Egyptian pyramid showing circumcision done on awake patients one of them was restrained by second person while the operator operate.

Figure 4
Figure 2: The oldest medical text “handbook” Clay Tablet with pharmacological inscription from Nuppur late 3rd Millennium B.C. University museum, University of Pennsylvania, Philadelphia USA.
(An anonymous Sumerian Physician, who lived toward the end of the third millennium B.C. recorded a collection of his valuable remedies of prescriptions. In a cuneiform scripts he wrote down more than dozen of his favorite remedies. This is the oldest medical handbook known to man was found buried in the Nippur ruins for more than 4000 years).


(Eber's Pyrus is a medical document written in hieratic characters, George Ebers purchase it in Egypt in 1873 and it was published in 1875. This document was written in the first half of the 16th century B.C. and many of its prescriptions dated back to 2500 B.C. It is a collection of recipes for various diseases).
Figure 8
Figure 5: Nefertitti present opium to her husband in picture of Ancient Egypt pyramid. After: Baraka A. 2000; M.E.J.Anesth. 15(4) 425.

Figure 10
Figure 7: Mandrake plant from Arabic medical manuscript in Istanbul mosque (courtesy of Dr N. Hamdi).

Figure 9
Figure 6: reproduction on pyerus duplicate modern picture of Cleopatra give birth a ceremonial picture of ancient Egypt (Khan al Khalili posters, Replica drawings and painting).
Figure 11
Figure 8: Opium plant from botanical manuscripts in Istanbul mosque (courtesy of Dr N. Hamdi)

Figure 12
Figure 9: Surgical instrument from ancient Egyptian pyramid wall (Replica drawings)

The temple of “Kom Ombo” Upper Egypt showing surgical instruments, routed to Ptolemy period. Also quoted as picture from Wellcome historical Medical Museum Thorwald, J.: Science and secrets of the early medicine, p 78. Thames & Hudson - London -1962).

The Assyrians herbal contained: Belladonna, Cannabis and Mandragora. The Ancient Egyptians used opium poppy. In sense contemporaneous development were noticed in India and China. All these old civilizations influenced the Greek medicine. Both the Assyrian and Egyptian physicians has obtained artificial sleep for their patients during painful procedures by quickly compressing the Carotid vessels of the neck, this practice was followed as well by the Greek physicians[1,2,3,4,5,6,7,8,9].

Greek and Roman Medicine was in a way a continuum of the instructions of the father of medicine Hippocrates, and the great physician Galen of the second century. They
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commented on surgery and in particular Galen was famous for his interest in Dissection. Dissection of live animals and humans may be considered the predecessor of surgery. Both influenced medical thoughts over centuries. According to Galen's recommendations it is imperative to take great care with the use of powerful narcotics such as opium, considering it a dangerous drug. It is to be used in colic and in other very violent pains.

The Romans used decoction of mandrake in alcohol. Pliny (A.D. 23-79) says of the juice of mandrake: “Administered in doses proportional to the strength of the patient, this juice has a narcotic effect...it is given... for injuries inflicted by serpents, and before incisions of punctures are made in the body, in order to insure insensibility to the pain.” By the time of Paulus (7th century) opium and mandrake have fallen into neglect.[1,2,3,4,5,6,7,8,9]

Arabic translation of the Greek medicine helped to make Islamic physicians supreme in the middle Ages. But it is known that they were influenced in later stages by Indian, Chinese and Alexandrian medicine

Baghdad became the world's leading medical and drug center. With the skill of the Arab Alchemists, the art of drug making began to evolve into the science of Pharmacology. Western physicians emerging from the Middle Ages found the Arab pharmacopoeia, in which a list of medicinal plants composed the anesthetic armamentarium of our forefathers [2,3].

The Arabs were familiar with surgery and practiced several procedures.

Al Zahrawi, Ibn al Nafis and Ibn al Koff, specially mentioned here, to monitor anesthetic practices they followed. Al Zahrawi did not mention the method and drugs used to help the patient during surgery. He mentioned the use of servants to restrain the patient and a patient who is communicating with his surgeon.

In spite that historians repeatedly mention that: surgeons administered sedative-analgesic mixtures before surgical operation. In his writings, Avicenna indicated that a patient who wants to have an amputation of one of his limbs must have a drink prepared from a mixture of mandragora and other sleeping drugs [19]. Other attributed the soporific or anesthetic sponge to be an Arabic method to administer anesthesia these may have been used in the time to come after the days of Ibn Al Koff.

We find also in writings of Ibn al Nafis, known to describe the pulmonary circulation, and practiced surgery, as
ophthalmologist, some clear in clues on these issues. In his book Al Shamel we see a clear description on patient restrain under surgery:

“First, he should comply with all the instructions of the physician, and should not abstain from following them.

Secondly, he should keep his body in the same posture that was assumed at the beginning, and throughout the time of operative treatment, not altering the position of any part whatsoever.

If, however, the patient could not keep still because of the intensity of pain or because he is an infant or a child, and so on, he should be held in a fixed position by somebody else.

If it is difficult to keep him still, and it is feared that the patient’s disturbance may disrupt the operation -or he may inflict harm upon himself in any other way -then he should be tied down in the most favorable position.

For example, during the couching operation of the eye, if it is feared that the tip of the needle may penetrate and disrupt the humors of the eye, and in like cases, it would be necessary to tie the patient down in the most favorable position.”[12]
Figure 15
Figure 12: Pulmonary circulation as described by Ibn al-Nafis (@Modified form Ibn al-Nafis and modern physiology Al-Hajaj in proceedings of symposium on al Soufi and ibn al-Nafis, p.132 Amman, Jordan 1987) [,]

Figure 16
Figure 13: Manuscript and translation of pulmonary circulation by Ibn Al Nafis Ibn Al Nafis: Shareh Tashrih Al Qanoon; Arabic Manuscripts No. 123. Medicine. National Library. Cairo- Egypt. [,]

Figure 17
Figure 14a: Drawings of dental surgery from Turkish medical manuscripts showing operation on awake-restrained patient
Ibn Al Koff (1232-1286 AD), who is a student of Ibn Al Nafees wrote a complete chapter on pain relief in his book “Al Omdah Fi Sinaat Al Jirahah”. He differentiated between true and non-true pain relief considering non-true pain relief the “Anaesthetic” which the surgeon may use for treatment of pain or to be able to institute the surgical treatment [12,13]. Arabic version in fig 15.
The soporific sponge (Anesthetic sponge) “Inhalational anesthesia”

(Al Esphanjah al Mourakkidah) $^{15,16,17,18,19,20}$

The Arab-Islamic surgeons and Use of sedatives in operative surgery: Debated and discussed are the use of general sedatives in operative surgery “The Arab anesthetization was unique, true in its action and merciful to the receiver. It differed completely from the alcoholic drinks which the Indians Greeks and Romans forced on their patients just to decrease but not relief pain. This scientific discovery is attributed to an Italian or physicians from Alexandria. The truth remains that the technique of use of “soporific sponge” is purely Arabic and was not known before. The “soporific sponge” was put in juice of hashish, papver, and hyocymine, and then dried under the sun. When called upon, for use, it was humidified again, and palced at the patient's nose, so that it gets absorbed by the mucus membranes. (It is presumed to cause deep sleep and relief of surgical pains.) The discovery was introduced into Europe and was practiced until the 18th century when modern inhalational anesthesia was introduced in the 40s of 19th century. $^{[10]}$

The principle of inhalation was known to Arab – Islamic surgeons as described by an Arab medical historian: Anesthetization was known in the Arab East during middle ages. The technique consisted either of inhaling anesthetizing material placed on sponge “soporific sponge” or placed in a swinging censor spreading odors of anesthetizing materials that are perfumed with Al-Oud. Some was used orally. The technique depended on suggestibility and the use of the following plants Conium maculatum (Hemlock), Papver somniferum and hyocymus albus, Belladdona, cannabis sativus, cannabis indica $^{[11]}$

Figure 22
Figure 20: Manuscripts first page of Al Omdah of Ibn Al Koff

This state of medical practice and doctrines continue to dominate over many centuries. The major books which were followed were: Avicinna's Al Canon, and Ali Ibn Al Abbas's Al Kamel. The Arabic political power terminated in the East by the fall of Baghdad. But the medical heritage stood the events and so was during Salajic and early Ottmanic periods. Between: (1481-1520) traditional medical education in Ottmanic schools was comparable to those of other famous European medical centers. Physicians and scientists from Arabic, Persian and Turkustani regions were taught in the ottmanic medical schools. By the year 1520 the medical schools deteriorated, as the state was going in rough times. This situation changed when the Sultan Mohammed II (1808-1839) opened modern medical schools in Istanbul:

Figure 23
Figure 19 : Artist impression on how Â“anesthetic spongeÂ” (inhalational anesthesia) was used by surgeon in Arabic-Islamic medicine. (Al-Bakri A.K., Takrouri M.S.M., Ghori S.K., Seraj M.A. Surgical advances and practice of anaesthesia in early Islamic Era Saudi newsletter 10,1.1-3 1999) [1]
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One for medicine Toubanah, and one for surgery Jirahanah which in 1911 became the Faculty of Medicine.[13,14]

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