

## Aspasia and Cleopatra Metrodora, Two Majestic Female Physician – Surgeons in the Early Byzantine Era

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### Abstract

**Introduction:** Female physicians in antiquity were doomed to oblivion, pushed aside by their male colleagues. Aspasia and Metrodora have accomplished to leave their stigma and ameliorated the surgical techniques of the era.

**Objective:** The objective of this review is to provide all available knowledge concerning to those two significant female historical medical figures.

**Methodology:** A thorough search in the digital library of the Greek literature TLG (Thesaurus Linguae Graecae) was performed combined with a search in electronic databases such as Google Scholar, Scopus and PubMed. The key terms that have been used during the review were Aspasia, Metrodora, surgery, gynaecology, and Byzantium.

**Results:** Both Aspasia and Metrodora performed a series of innovative surgical operations during their era.

**Conclusion:** Aspasia's venesection, shemorrhoidectomy, hysterectomy, open subinguinal varicelectomy and hydrocelectomy and Metrodora's breast and face reconstruction, re-suturing of the vaginal hymen and breast and uterus cancer excisions, present great similarities to modern surgery.

**Keywords:** Aspasia; Metrodora; Women physician in antiquity; Gynaecology; Surgery; Cancer; Byzantium

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### Introduction

Women in ancient Greece were confined socially, dedicated to house keeping, without having access to higher education. Although for some have been ordered an exception, and they were permitted to studied philosophy and medicine, the great majority of the female population was as educated figures mainly doomed to oblivion. For the ancient Greeks medicine was a divine science derived from the gods, thus women and slaves were not allowed to perform it [1,2].

It was at the era of the Greek historian Xenophon (ca 430 BC to 354 BC) who lived in Athens, when a local legislation stated that women should have had the responsibility for their family's health, engraving their path towards medico-philosophy [3]. Some eons later, it was the Roman emperor Julius Caesar (100 BC to 44 BC) who ordered that all women who were educated as physicians could gain citizenship and relieved them from all

taxes. Women of noble origin had an easier access to education, creating a new status quo [4,5].

Women left their stigma as physicians, midwives, surgeons, druggists, herb collectors (Greek: ριζοτόμος), nurses, therapists and wet nurses for the newborns (Greek: τροφός, τιθή). Among then stood two exceptional female figures, Aspasia (ca 4<sup>th</sup> century AD) and Cleopatra Metrodora (ca 7<sup>th</sup> century AD, or 2<sup>nd</sup> century AD), as excellent examples of influential physicians who managed to overcome the sex barrier and make important contributions on the medico-philosophical knowledge of their time [6,7].

### Aspasia

Aspasia's pioneering work and prolific writings influenced all major figures of the Byzantine medicine, like the eminent physician and surgeon Aetius of Amida (6<sup>th</sup> century AD, died in 575 AD), and the innovator of surgery Paul of Aegina (ca 625 AD to 690 AD) [8-11]. Her admirable knowledge and techniques in

the field or the innovative surgical procedures were thoroughly mentioned by Aetius, who considered her as a medical genius and at least equivalent to the best male surgeons of her time [12-14].

Aspasia gained fame as a midwife and gynecologist, founding the origins of the obstetrical practice, both regarding the early techniques of induced abortions and the surgical management of the early failure of pregnancy (**Figure 1**) [15,16]. She seems to have tried to impress her pregnant patients with the necessity of being extremely careful in order to avoid abortion. They were advised not to go on chariot rides or jaunts, particularly over rough roads, exercise violently, and worry needlessly, not to eat spicy foods and carry heavy loads [17]. Some researchers named Aspasia's chapter "On lateroversion, anteversion, and retroversion of the uterus" [18]. As a trustworthy practitioner, Aspasia was performing abortions, only if the pregnant woman's life was endangered, or if an underlying disorder rendered her unsuitable for pregnancy. She chose surgical abortion in cases of women whose life was threatened during labor, due to a very large fetus, a small uterus, a cervical stenosis, or an obstruction. A drug based abortion could have been achieved according to her opinion with abortion-inducing drugs, fluorine combinations and pessary, or intense physical therapy [12,19].

Even surgery, at least gynaecological surgery, may not have been impossible for a woman to practice. Aspasia discussed venesection and surgery for haemorrhoids of the uterus, external edematous tumors of the labia, and for varicose hernia of the labia. She had performed a variety of surgical operations introducing her own innovative surgical techniques [6].

Her operation for uterine hemorrhoids, which was later adopted by Aetius of Amida, was as follows: "the ones that are hard more prolapsed and may bleed have to be dissected imminently. The ones that are bleeding have to be dissected after they have been circularly incised around their basis and enfolded tightly with a loop" [19]. Aspasia gave an early description of a surgical excision of hemorrhoids, a method used until almost recently. Even though today this procedure is associated with significant post operative pain and long recovery, it is noteworthy that she had

suggested an urgent operation for what it could be understood as a prolapsed, thrombosed, potentially ruptured hemorrhoid, a medical condition which remains until nowadays an acute indication for a patient to be operated [20].

Among the fragments of her saved treatises a surgical treatment for varicoceles, was mentioned. Aspasia followed a careful ligation and dissection of the vessels, one-by-one inside the local plexus. Her technique included roughly "a linear incision, smooth setting apart of the adjacent tissues, ligation of the vessel via loops and, afterwards, its excision. The same technique should be thoroughly followed for each one of the varicose veins" [19]. This procedure presented in fact an open subinguinal varicolectomy, not far, at least in its concept, from today's surgical methods [21]. A second innovation introduced by Aspasia, was the operation with which she had surgically treated the cases of hydrocele. Her procedure has been recorded as such: "the incision should be linear, symmetrical to the lump. After dividing the superficial skin and splitting the subjacent tissues, we cut through the integument which contains the fluid via a seared surgical clasp. When the fluid is depleted, we etch a circular demarcation and remove the pus in order to finally pass two or three sutures through the lips of the incision" [19]. Aspasia's technique resembles today's typical hydrocelectomy, during which the tunica vaginalis is to be excised, the fluid drained, and the edges of the tunica sutured to prevent the re-accumulation of fluids, a still much acceptable option in the modern surgery [21].

### Cleopatra Metrodora

Cleopatra Metrodora (**Figure 2**) (Metra in Greek: μήτρα: uterus, or mother doron in Greek: δῶρο: gift), was an illustrious Greek surgeon, probably of Egyptian origin, who lived around the 7<sup>th</sup> century AD, while for some researchers was a contemporary of Soranus of Ephesus (ca 1<sup>st</sup> - 2<sup>nd</sup> century AD), thus she lived in the 2<sup>nd</sup> century AD [22-25]. As an extremely capable gynecologist, midwife and surgeon, Metrodora wrote a great number of medical treatises, among which stood the "On the uterus, abdomen and kidneys" [26,27]. Her masterpiece was constructed in such a way, as to describe in details all women diseases, in a similar pattern to a modern textbook. She started with the following introduction about the nosological entities "some of them are intricate to treat and others are fatal, by these notes we will recognize each one" [25]. It is extremely unusual that neither Byzantine medical writers, such as Oribasius (ca 320 AD to 403 AD), Aëtius of Amida, Paul of Aegina (ca 620 AD to 690 AD), Pavlos Nikeos (ca 7<sup>th</sup> century AD) and Alexander of Tralles (ca 525 AD to 605 AD), nor Patriarch Photius the 1<sup>st</sup> (ca 810 AD to 893 AD) of Constantinople in his "Bibliotheca", or "Myriobiblon" have not mentioned her work. Thus, Cleopatra Metrodora seems to have been completely unknown and forgotten for many centuries [27].

However, there is a parchment manuscript of 263 pages inside the "Laurentian Library" in Florence, Italy, dated back to the 12<sup>th</sup> century. A work divided into 108 chapters, attributed to the skillful Cleopatra Metrodora. She was a highly educated woman physician, who dared to write her scientific views in order to express her freedom of thinking and stood among the best, when women's rights were in status nascendi. All these, present evident of her major inclination towards research and ongoing love for science [27,28].



**Figure 1** Ancient Roman relief carving of a midwife attending a woman giving birth, 2<sup>nd</sup> century AD, Wellcome Library, London.



**Figure 2** Cleopatra Metrodora, imaginative portrait, Athenian Academy Records, Kouzis, 1945.

Cleopatra Metrodora, as an experienced gynecologist described a plethora of natural methods for determining the fetus' sex. In cases of a difficult labor, she recommended for the "hysteric" pregnant to be spread with almond oil. She suggested therapies for the treatment of menorrhagia and metrorrhagia, of the hysteric shock, and advised to "apply potato porridge mixed with goose fat in a form of pessos" (pessary, something like a tampon, a small soluble block that is inserted into the vagina to treat locally an infection or as a contraceptive). She was able to determine possible sexual abuse, mastering a method on how to diagnose virginity. She defined the way to diagnose and treat female sterility by administering herbal and chemical drugs, and also provided instructions for breastfeeding and breast milk production. She had, sometimes, followed Alexander of Tralles' treatment methods and used the herbal substances mentioned by Hippocrates (ca 460 BC to 370 BC) and Theophrastus of Eresos (ca 371 BC to 287 BC). She had used intravaginal and intraureteral rowels to cure local infections, while she was able to perform embryotomias of the dead embryos to save the pregnant. She was also considered able to cure obesity, diseases of the kidney and stomach [27-29].

Metrodora as a surgeon, she was among the few to perform cosmetic operations, such as aesthetic breast and face reconstruction, and re-suturing of the vaginal hymen to create a sense of a new virginity for the abused, or sinful "unlucky" women. In an effort to cure the most fatal of diseases, malignant ulcer, or scirrhus, or as named today cancer, she suggested surgical treatment for both the breast and the uterine cancer, following the Hippocratic dogma that any disease that can't be cured with a conservative way must be dealt with a scalpel and

a flatiron to prevent both massive hemorrhage and infection of the surgical wound, those innovative surgical operations, were all procedures ahead of her era [28,29].

## Discussion

Aspasia and Metrodora, both lived against the dazzling environment of the ancient Hellenic territory, a world dominated scientifically by men. They forged their way up to the chain of the medical fame by producing an innovative series of newly performed surgical operation and by establishing their opinion, written in medical texts that although fragmented, survived until nowadays [5-7]. According to Soranus of Ephesus [30], they should have had soft hands with long fingers, perfect memory and perception, great medical and pharmacological knowledge to treat birth complications, great surgical skills and above all the quality to provide psychological support to their patients [30]. The fact that women physicians were able to perform surgical operation and had most of the gynaecological practice since antiquity appears likely, as Galen (ca 129 AD to 216 AD) failed to mention a female patient except for consultation [17].

Although they have both practised their skills in the early stages of surgery, they had at their disposal a plethora of surgical instruments alongside with gauzes, compresses, bandages and drugs in the forms of powders, liquids, ointments, creams, pessos, etc. Dioptras, hedrodiastoleus, mochliskos, ostagra, kauterion, motos moloubus, catheters, metrechytes, agkistra, tricholabis, embryoulkos, staphylagra, osteotomes, scalpels, psalis, spathomele, cyathiscomele (**Figure 3**), "all placed harmonically inside the surgeon's medical bag, arranged in the most appropriate way, following a methodical layout, as physician cannot keep everything in mind" as Hippocrates stated [31-35]. Thessaly's endemic plant mandrake (Greek: *μανδραγόρας*) (**Figure 4**) could have been used as a general anaesthetic (it



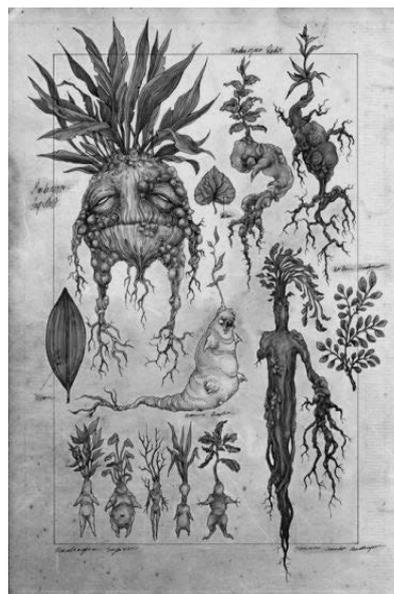
**Figure 3** An ironmonger's wares, including a shelf of surgical instruments, 2<sup>nd</sup> century AD, Museum of the Vatican, Rome, published by Laignel-Lavastine in Paris during 1936.

contains scopolamine), combined with morus alba (Greek: σπόδος μούρων) and hederá (Greek: σπόδος κισσοῦ), known sedatives of the era [36,37]. Antisepsis' strict protocols were known since Hippocrates, a combination of multiple rinses of clean boiled rain water, firewater, salt, hot sea water (hypertonic serum), copper, tar (contains carbolic acid), resin, perfumes (myrrha, boswellia, thymus, cinnamomum, salvia, pinus, cypressus sempervirens, artemisia absinthium, aloe), firewater, baked honey, wine, vinegar, copper oxide, sulphate and fire (Greek: πυρ). Vessels ligations with aseptic strings, made by animals' intestines, or of copper, and/or cauterization were used to stop the haemorrhage [38-47]. Fluids drainage and endotracheal intubation for the patient to undertake the surgical operation were also known techniques of the era [46,47]. Under those conditions, similar as a concept to modern surgery, Aspasía and Metrodora accomplished to ameliorate medical knowledge towards an epoch of more complicated operations.

Aspasía's work presented great similarities to Soranus [30], having a great interest in palliative patient-centered care, while Metrodora's was thoroughly Hippocratic in her understanding about diseases and treatment efforts, having a pioneering way of operating [47]. Although it remains unclear if Metrodora was familiar with the Hippocratic remedies and herbal medicine, or if she had consulted collections that have been influenced by Hippocrates and his followers, it is certain that her drug treatment proposals are similar to those that have been suggested by Hippocrates [31], in most cases more simplified with fewer ingredients [28].

## Epilogue

Aspasía and Cleopatra Metrodora, were as most female physicians unappreciated, doomed to oblivion, scientifically pushed aside despite their significant work. Their education, skills, courage, innovation, nerve, and audacity yell on their behalf, in order for them to gain their place among the best in the history of surgery.



**Figure 4** A botanical illustration about mandrakes, Codex Seraphinianus, 1981.

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