

HISTORY OF ONCOLOGY

Aretaeus of Cappadocia (ca 1st-3rd century AD): views on hepatic cancer

Gregory Tsoucalas¹, Markos Sgantzos^{1,2}

¹History of Medicine, Faculty of Medicine, University of Thessaly, Larissa ²Department of Anatomy, Faculty of Medicine, University of Thessaly, Larissa, Greece.

Summary

Aretaeus lived in an era when cancer was known to be a fatal disease. He had understood both liver's capacity to regenerate, and its vital role for the body's homeostasis, and proposed the treatment to confront hepatic cancer. Although human's anatomy was well studied, especially in the Alexandrian School, and a plethora of surgical in-

struments and techniques were available, he had suggested a more holistic-palliative approach for hepatic cancer by applying a suitable dietetic regime, pain killers and psychological support.

Key words: Ancient Greece, Aretaeus, hepatic cancer, surgery, palliative medicine

Introduction

Aretaeus, native of Cappadocia (Greek: Aretaios o Kappadokes) (Photo 1), lived in Alexandria, most probably between the end of the 1st

and the beginning of the 3rd century AD. He was an exceptional famous physician, who practised innovative medicine as a representative of the Ec-

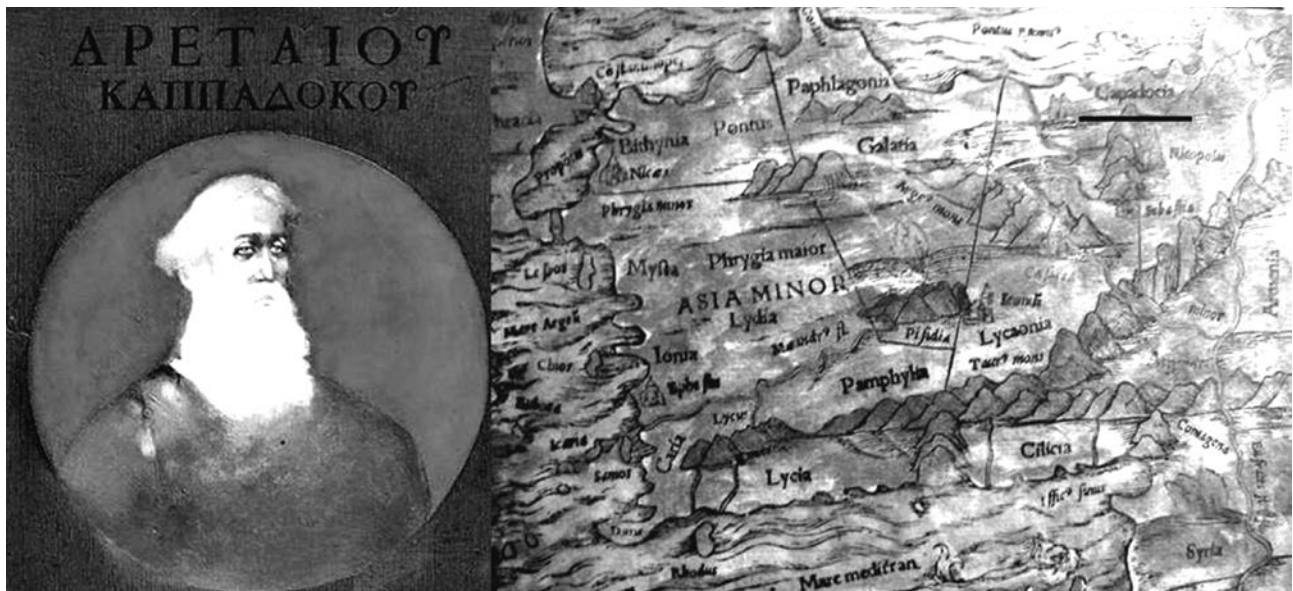


Photo 1. Aretaeus of Cappadocia, oil on panel by Mahmut Karatoprak, 2015, and a 16th-century map of Anatolia from Münster's *Cosmographia* depicting "Cappadocia".

Correspondence to: Gregory Tsoucalas, MD, MSc, Hist Med Dipl, PhD. Ieroloxiton 155, Agioi Anargyroi, Volos, P.C. 38334, Greece.
E-mail: gregorytsoucalas@yahoo.gr

lectic School (Greek: Eklektiki Scholi). Aretaeus wrote his manuscripts in Ionian dialect, the dialect that had been used by Hippocrates and his followers for the compose of the Corpus Hippocraticum, in such a way that no medical author of the antiquity surpasses him in his vivid portrayal of various diseases. Although his efforts to resemble Hippocrates indicated at the era a measure of vanity, Aretaeus became a prestigious therapist, a prolific writer, and an important medical figure for the centuries to come. Although he had followed the Hippocratic doctrine of the 4 humours (yellow bile, black bile, blood, and phlegm) and the “*pneuma*” (Greek: *pneuma* ≈ air ≈ spirit ≈ the vital force of life), he had shown more devotion towards anatomy and physiology than most ancient physicians [1-4].

Few are known concerning his biography. Among his magnificent works stand his eight books collection, which consists of “De causis et signis acutorum morborum A and B” (Ancient Greek: *Peri aition kai simeion oxeon pathon*, English: *On the Causes and Symptoms of Acute Diseases*), the “De causis et signis diuturnorum morborum A and B” (Greek: *Peri aition kai simeion chronion pathon*, English: *On the Causes and Symptoms of Chronic Diseases*), the “De curatione acutorum morborum A and B” (Greek: *Oxeon noson therapeutikon*, English: *On the Cure of Acute Diseases*), and the “De curatione diuturnorum morborum A and B” (Greek: *Chronion noson therapeutikon*, English: *On the Cure of Chronic Diseases*), that granted him a honourable place among the greatest figures of medicine. Apart from his saved work, it was Aretaeus himself, who mentioned the titles of five more treatises that are no longer extant: *On Fevers* (Greek: *Peri empyretion*), *On Diseases of Women* (Greek: *Peri gynaikeion pathiseion*), *On Drugs* (Pharmacology) (Greek: *Peri pharmakon*), *On Surgery* (Greek: *Peri chirourgikis*), and *on Prophylaxis* (Greek: *Peri prophylaxis*) [1,3].

Aretaeus was unique in refusing to abandon the patient who was incurable, ordering all appropriate therapeutic measures to be taken, and when those had been failing, he had offered support, sympathy and empathy, giving the sense of a holistic approach, a hope for a milder way to cope with the disease. During his practice, he had observed such a fatal disease, named at the era “*scirrhus*” (Greek: *skirros*), or “*elkos*” (Greek: *elkos* = ulcer), or “*thirion elkos*” (Greek: *Thirion* = beast), which were some of the first denominations of cancer in ancient Greek medical lit-



Photo 2. Aretaeus of Cappadocia, portrait by Diamantakis Ioannis, 2004, and a collection of ancient Greek bronze coin depicting a crab (Greek word for crab: *karkinos* = cancer). **A:** Greek city of Priapos in Mysia, ca 300-200 BC. **B:** Akragas in Sicily ca 425 BC Eagle Hare Crab Fish. **C:** Mysia of ancient Asia Minor, ca 3rd century BC

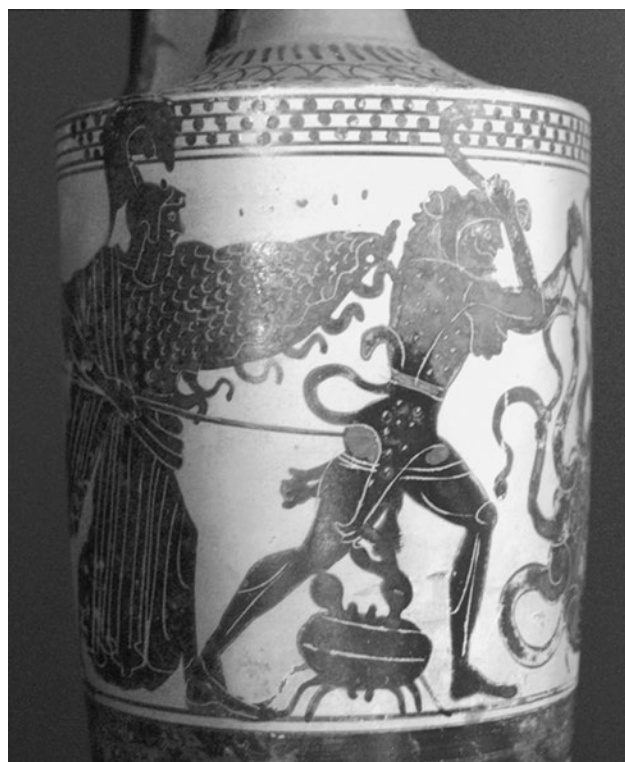


Photo 3. Athena, Heracles attacked by the crab and the Lernaean Hydra. White-ground Attic lekythos, Diosphos, ca. 500-475 BC, Louvre Museum.

erature [2,5-6]. However, the origin of the word “cancer” was credited to the Hippocratic physicians, who used the terms “*karkinos*” (Greek word for crab) in an attempt to better describe

tumours, as the shape of the crab was, according to the ancient Greek physicians, similar to the fatal disease cancer, which “grasps” the affected areas (Photo 2) [7]. The first medico-philosophers of the Hippocratic cast had introduced the name after remembering the myth of the ancient Greek Heracles. “Karkinos” was a giant crab which came to the aid of the monster Hydra during its battle with Herakles at Lerna. The mythical hero crushed it beneath his foot, but as a reward for its service the goddess Hera placed it amongst the stars as the constellation known today as “Cancer” (Photo 3) [8]. According to Aretaeus’ opinion, the excess of the black bile was to be blamed as its main pathogenetic factor [2,5-6]. Among the cancer types he was able to recognize uterine, renal, colon, spleen, head and neck, and gastric cancers, and had reported a severe cancer form in human’s liver, the hepatic cancer (Greek: skirros or elkos hepatos) [9-13].

The present study gathers the fragments from inside Aretaeus’ work collection, to unveil both his opinion on hepatic cancer, and his efforts to treat and cope with this deadly disease.

On hepatic cancer

The ancient Greek physicians had understood to some extent the liver’s potential for self-regeneration. The myth of Prometheus suggests that the liver was considered as immortal, both for its prodigious recuperative powers, and for its capacity to seat the soul and intelligence of the hu-



Photo 4. Black figure kylix depicting Atlas holding up the sky and Prometheus bound with an eagle picking out his liver, ca 555 BC, Vatican Museums and Galleries.

man beings. Prometheus tied up to be punished by Zeus, had suffered an eagle pecking at his exposed liver (Photos 4 and 5). According to the legend, the eagle devoured the liver repeatedly every day after its overnight recovery [14-16]. Aretaeus, not only was cognizant of this liver’s ability, but he had also understood its essential role on the body homeostasis by stating, “*in healthy periods, liver arranges the feeding of the body, while in times of sickness has even greater force towards the restoration of the health or towards the cause of death*” [17]. Hepatic cancer for him was a noxious malignancy, leading eventually to a torturing death [6].

Aretaeus, with the use of sophisticated surgical instruments (mochliskos, kauterion, catheters, agkistra, tricholabis, scalpels, psalis, spathomele, etc), operated hepatic abscesses and ulcers,

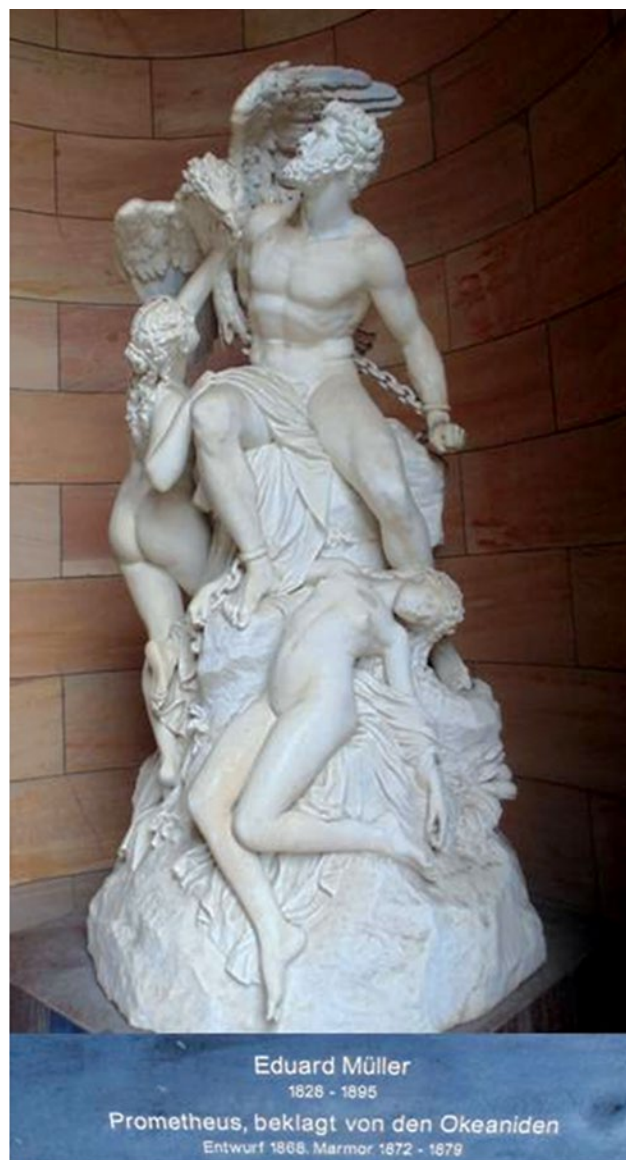


Photo 5. Prometheus Bound with the eagle ready to devour his liver and Oceanides, by Eduard Muller, 19th century, Alte National Gallery, Berlin (Tsoucalas personal collection).

recommending their opening, reintroducing the Hippocratic method of the diligent anesthesia, antiseptics (boiled rain water, spirit, copper, tar, resin, myrrha, etc), scalpel cleaving with an incision made near the umbilicus region, or proximal to the last rib, tumor opening for the pus to be redirected or drained and/or ablation, cauterization, sterilization and stapling. An abdominal surgical procedure, due to the hemorrhage risk, should have been limited to the superficial anatomical area of the liver (Greek: hepar). Such a procedure may have been existent for the superficial malignant ulcers, or the malignant hepatic tumors, at least for those masses in proximity with the liver's capsule and under peritoneum, an anatomical element that should have been left intact, always performed by experienced physicians-surgeons [18,19]. Due to the fact of its fatality, or the perspective of the era that only surgeons should have been performing surgical operations, Aretaeus attached great importance towards more non-invasive treatments [6].

Hepatic hardening (the macroscopic depiction of scirrhus), was usually for him a latent ultimate result of the hepatic abscesses *"the liver inflammation persists, and the pus remain inside the liver, the pain persists too, the enlargement turns to a rough area and transformed to cancer"*. Thus, those abscesses should have been removed in early stages, as soon as possible after the diagnosis, and the liver had to be left to be healed (regenerated). The course of the disease, as well as its

symptomatology, were well known for him, *"the patients, anorectic, dislike the sweet and preferably desire the bitter foods. They are pale, almost green, with chills, low temperature of the body, and swellings in the lumbar and feet areas. They finally die with wrinkled faces, dry abdominals, multiple diarrheas, weakness (marasmus) and exhaustion"*. Although Aretaeus, had realized that ascites (Greek: askites) was the main complication of the liver's cancer, he had wrongfully believed that it could be cured through a massive urination consisting of a thick and full of various impure sediments urine, or bleeding and/or strong and prolonged sweating [20].

Aretaeus realized that most cancer patients suffer from the unpleasant sensory and emotional experience of pain, and that cancer, as a chronic incurable entity *"causes cachexia"* before death [17]. To avoid cachexia, to invigorate the organism and to help the pus to be redirected towards the stomach, or the bladder, or the kidneys (pus redirection was a famous treatment method during that era), he had suggested a specific dietetic regime. A combination of donkey milk, fruit juices, milk creams, starch flour and pie with milk should be given. In the case of other types of food, they all should have been palatable, succulent and easy to digest [20]. For the redirection of the pus in order for the malignancy to be relieved (a treatment method famous during that era), apart from the diet, a plethora of herbal remedies were known at that time, such as hyssopus officinalis, leek, at-

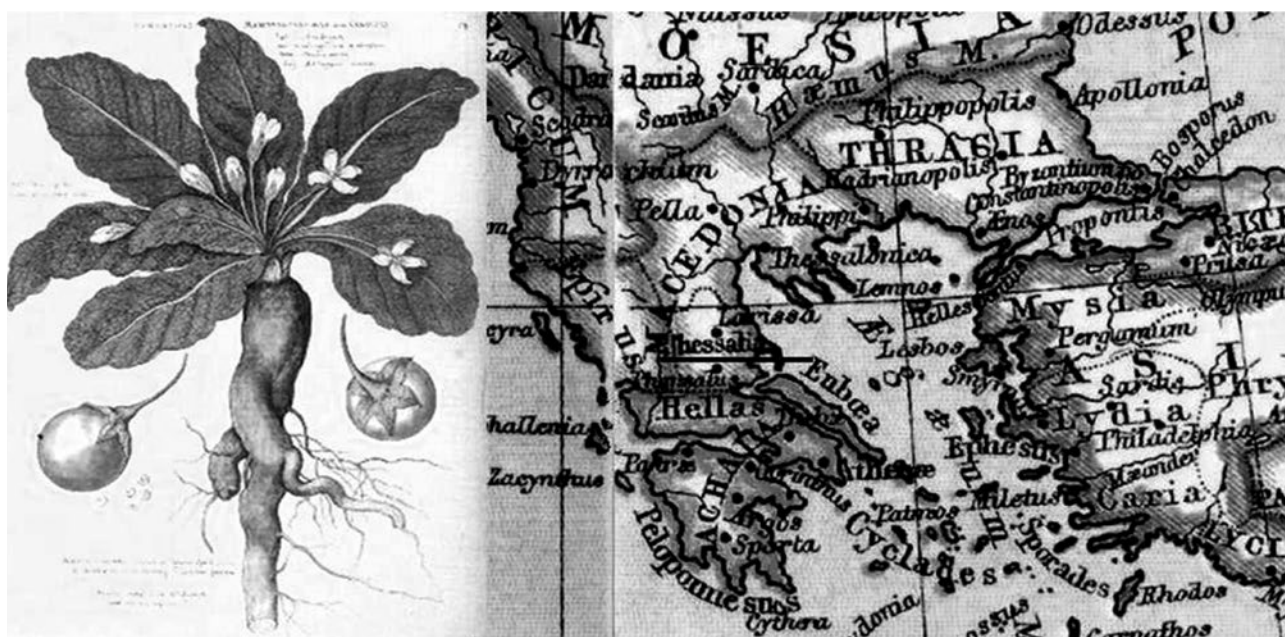


Photo 6. Mandrake, Otto Wilhelm Thome, Flora von Deutschland, published in 1885, and a map of the ancient Greece depicting Thessaly, Atlas of Ancient and Classical Geography in the Every man Library, published by JM Dent & Sons Ltd, 1907.

emisia absinthium, donkey's milk, husked barley, piper, zingiber, ligusticum, asarum europaeum, valeriana and adiantum [17,20]. For the palliation he must have used the well known Thessaly's endemic plant mandrake (Greek: mandragoras) (Photo 6) as an anaesthetic (it contains scopolamine), combined with morus alba and hederata, known sedatives of the era [21,22]. It seems that Aretaeus have tried to emulate a more holistic therapeutic regime, similar to those that have been experienced since the era of Asclepieia [23].

Epilogue

Aretaeus identified that hepatic cancer was a fatal disease, eventually leading to death by cachexia. Despite the facts that Aretaeus was an ingenious physician able to perform various pioneering surgical operations, that he had the cognizance of a detailed human anatomy (the Alexandrian School

had a notorious fame for its autopsies, both human and animal), that he could macroscopically recognize cancerous tumors and malignant ulcers, that he had the knowledge that liver could heal, that he had understood liver's vital role for the human organism's homeostasis, he had introduced a palliative approach for hepatic cancer. Even in the case of surgery, this should have been palliative in nature, restricted only to superficial hepatic impairments, with an emphasis for the stomach, large blood vessels, and the intestines to be protected [6]. Surprisingly, modern medicine in most cases concerning hepatocellular carcinoma (end stage), recommends, in agreement with Aretaeus' views on the matter, palliation (transarterial chemoembolization, sorafenib), pain control (drugs, radiation), specific nutrition (nutrition and dietary supplements), psychological support both for the patient and the caregivers, and in general stability in the quality of life [24,25], proving Aretaeus' innovative thinking.

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