

## ORIGINAL ARTICLE

### Aretaeus of Cappadocia (1<sup>st</sup>/2<sup>nd</sup> - 2<sup>nd</sup>/3<sup>rd</sup> Century AD), Descriptions on Cancer

#### Abstract

Aretaeus of Cappadocia, lived in an era when cancer was already a disease, well known for its deadly outcome. Inside his momentous treatise, composed of 8 books, he had outlined various types of cancer. He had understood cancer's fatality and proposed some curative treatments. Our manuscript composes the fragments related to cancer, in an effort to present Aretaeus' views on the matter. He had emphatically ignored the breast cancer, maybe due to fact that this was a malignancy type that could be operated with a strong change of survival according the medical knowledge of the era. On the other hand, various malignancies such as colon, hepatic and uterine cancer, attributed to the black bile (Humours theory), were thoroughly examined, establishing a valuable medical source for the future physicians to rely on.

**Key words:** Aretaeus, cancer, skirros, elkos, black bile, Greco-Roman antiquity

Received: 13 Feb 2016; Accepted: 22 Apr 2016; Online published: 5 Aug 2016  
**Research on History of Medicine/ 2016 Aug; 5(3): 119-130**

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## Introduction

Aretaeus, native of Cappadocia (Greek: Αρεταίος ο Καππαδόκης) (Figure 1), lived in Alexandria, between the end of the 1st and the beginning of the 3rd century AD, practicing medicine as a representative of the Eclectic School (Greek: Εκλεκτική Σχολή). He wrote his manuscripts in Ionian dialect, in such a way that no medical author of antiquity surpasses him in his vivid portrayal of various diseases.<sup>1,2</sup> While his work was firstly published in Latin during 1552 in Venice, it was Kuhn's edition in Leipzig during 1828, which still remains as the most widespread among historians. In between, it was the Greek humanist scholar Adamantios Korais (Greek: Αδαμάντιος Κοραΐς) (1748-1833) (Figure 2), who translated Aretaeus' treatises in French, during 1793.<sup>3,4</sup>

- 1- Maggina, 1890: 493-8.
- 2- Tsoucalas, 2012: 313-5.
- 3- Kouzis, 1950.
- 4- Magill, 2003.



*Figure 1. The eminent physician Aretaeus of Cappadocia, portrait published during 1754.*

Ionian dialect, was a dialect of the ancient Greek language which had not been in use for centuries. It was Hippocrates who used it to compose his great medical encyclopaedia "Corpus Hippocraticum". Aretaeus in a effort to imitate Hippocrates (c. 460-370 BC), and to grant his work the necessary prestige, had decided to follow Hippocrates steps. Apart from his language selection, he had followed the method-



cal classification of the diseases into acute and chronic, and gave vivid portrayals of a plethora of nosological entities. Although he had followed the doctrine of the 4 humours and the spirit (Greek: πνεύμα), he devoted more attention to anatomy and physiology than most ancient physicians.<sup>5-7</sup>



*Figure 2. Adamantios Korais, statue in Athens University, work of Kossos Ioannis.*

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” (Greek: Περί αιτίων και σημείων οξέων παθών, English: On the Causes and Symptoms of Acute Diseases), the “De causis et signis diuturnorum morborum A and B” (Greek: Περί αιτίων και σημείων χρονίων παθών, English: On the Causes and Symptoms of Chronic Diseases), the “De curatione acutorum morborum A and B” (Greek: Οξέων νόσων θεραπευτικόν, English: On the Cure of Acute Diseases), and the “De curatione diuturnorum morborum A and B” (Greek: Χρονίων νόσων θεραπευτικόν, English: On the Cure of Chronic Diseases), that granted him a honourable place among the greatest figures of medicine.<sup>8,9</sup>

- 5- Tsoucalas, 2012: 313-5.
- 6- Magill, 2003.
- 7- Tsoukalas, 2004.
- 8- Maggina, 1890: 493-8.
- 9- Tsoucalas, 2012: 313-5.



Aretaeus, the most prominent and at the same time enigmatic figure in Ancient Greek Medicine, was a prolific writer, who presented numerous diseases of the era with a detailed symptomatology. Aretaeus himself mentioned the titles of five more treatises that are no longer extant: *On Fevers*, *On Diseases of Women*, *On Drugs (Pharmacology)*, *On Surgery*, and *on Prophylaxis*. His total work is considered by contemporary medicine as outstandingly significant (Table 1).<sup>10-13</sup> He is considered to be the second most important medical figure in Greco-Roman antiquity after Hippocrates, and at least equal to Galen (c. 129-216 BC).<sup>14-16</sup>

Aretaeus (Figure 3), inside his work, had observed the most fatal disease, named “skirros” (Greek: σκίρρος), or “elkos” (Greek: ἔλκος = ulcer), two of the first denominations of cancer in ancient Greek medical literature. Naming the excess of the black bile (Empedocles’ and Hippocrates’ theory of the 4 humours) as its main pathogenetic factor, he had, on one hand recognised its fatality, and on the other tried to prescribe some curative prepositions.<sup>17</sup> Our study purports to compose Aretaeus’ views on cancer, by gathering all available fragments on the subject from within his saved work.

### On cancer

The eminent classic author from Cappadocia, had managed inside his work (Figure 4 and 5) to describe various types of malignancies (Table 2). Although he had not systematized his references into systems (i.e. gastrointestinal, visceral organs, etc), many scattered fragments reveal his views on cancer. He had firstly outlined the macroscopic pathological image of the malignant ulcers of the column. He had masterfully noted “if the secretions of the sarcoid ulcers are of hardest nature, like detritus and hard particles, the abscess is of malignant origin”. This was a fragment most probably reporting the appearance of the colon cancer, as in the next text lines, Aretaeus had quoted a plethora of symptoms caused by the “erosions of the lower intestines”. The symptomatology was surprisingly almost identical with the modern one, “at the beginning a sign of blood, body coldness in general, anorexia, nausea, malodorous burping, followed in some time from a dense hematoma consisted of blood and flegma (Greek: φλέγμα, mucus), like flesh or intestine zest, mucous stools, persistent diarrhea, local itch, acute abdominal pain, continuous flow of mucus, high fever, emaciation, strong weakness, dry tongue, low and weak pulse and eventually death”.<sup>18</sup>

- 10- Aretaeus, 1856.
- 11- Tekiner, 2015: 508-12.
- 12- Tsoucalas, 2015; 22(3): 322.
- 13- Deichgräber, 1971: 1-45.
- 14- Maggina, 1890: 493-8.
- 15- Laios, 2015: 40-3.
- 16- Karamanou, 2016: 1-7.
- 17- Deichgräber, 1971: 1-45.
- 18- Hude, *De causis et signis acutorum morborum*, 1958.



**Table 1:** Diseases inside Aretaeus' treatises (Based on Adam's F, English translation of 1856 and on Tsoukalas I, Greek translation of 2004).<sup>19-22</sup>

Treatise	Book Number	Contents
Περί αιτίων και σημείων οξέων παθών (Greek) De causis et signis acutorum morborum (Latin) On the Causes and Symptoms of Acute Diseases (English)	A	Diphtheritis, uvula's diseases-tonsillitis, peritonsillar abscess, laryngitis, pharyngitis, amygdalitis, phrenitis, lethargy, marasmus, apoplexy, paroxysm of epileptics, tetanus, spasms, angina, quinsy, lung diseases, asphyxia, loss of consciousness, tonsil and larynx ulcerations-cancer, pleurisy, hoarseness, hepatic diseases, hepatic abscess, hepatic cancer, ascites, spleen affections, spleen cancer.
Περί αιτίων και σημείων οξέων παθών (Greek) De causis et signis acutorum . (Latin) On the Causes and Symptoms of Acute Diseases (English)	B	Pneumonia, acute pulmonary oedema, dyspnoea, anaesthesia, cardiac arrest, hepatic abscess, ileus, bowel perforation, hepatitis, acute kidneys affections, urolithiasis, cystitis, urinary tract infection and bleeding, obstructive uropathy, drug intoxication, satyriasis, syncope, causus or ardent fever, cholera, colon cancer, spleen cancer, acute disease of the vena cava, hysterical suffocation.
Περί αιτίων και σημείων χρονίων παθών (Greek) De causis et signis diuturnorum morborum (Latin) On the Causes and Symptoms of Chronic Diseases (English)	A	Tuberculosis-ptthisis, thoracic empyema, lung emphysema, lung diseases, lung abscess, asthma, insomnia, icterus, cachexia, hydrops, tympanism, paralysis, paraplegia, bladder paralysis, miosis, mydriasis, epilepsy, melancholy, mania cephalaea, vertigo, scotoma, madness.
Περί αιτίων και σημείων χρονίων παθών (Greek) De causis et signis diuturnorum morborum (Latin) On the Causes and Symptoms of Chronic Diseases (English)	B	Stomach diseases, diarrhoea, lenteric diarrhoea dysenteritis, indigestion, gastric cancer, intestinal bleeding, abdominal colic, kidney abscess, kidney cancer, nephrolithiasis, hemorrhoids, rupture of kidneys, calculus bladder, bladder haemorrhage, bladder abscess, uterine cancer, diabetes, arthritis, gonorrhoea, affections of the womb, female hysterics, elephantiasis.
Οξέων νόσων θεραπευτικόν (Greek) De curatione acutorum morborum (Latin) On the Cure of Acute Diseases (English)	A	Cholera, gastrointestinal disorders, epilepsy, phrenitics, lethargics, marasmus, apoplexy, tetanus, quinsy, uvula, pharynx, pleurisy. (Treatment-cure).
Οξέων νόσων θεραπευτικόν (Greek) De curatione acutorum morborum (Latin) On the Cure of Acute Diseases (English)	B	Constipation, dehydration, Peripneumonia, cardiac affections, cholera, ileus, hepatic affections, hepatitis, dorsal vein and artery, acute affections about the bladder, urolithiasis, hysterical convulsion, satyriasis, proper environment. (Treatment-cure).
Χρονίων νόσων θεραπευτικόν (Greek) De curatione diuturnorum morborum (Latin) On the Cure of Chronic Diseases (English)	A	Spleen, melancholy, cephalaea, vertigo, epilepsy, phthisis, liver, spleen. (Treatment-cure).
Χρονίων νόσων θεραπευτικόν (Greek) De curatione diuturnorum morborum (Latin) On the Cure of Chronic Diseases (English)	B	Ileus, stomach, digestion, diabetes, dropsy, calculus and ulceration of the kidneys-cancer, gonorrhoea, coeliacs, arthritis elephantiasis. (Treatment-cure).

- 19- Kouzis, 1950.  
20- Tsoukalas, 2004.  
21- Tekiner, 2015: 508-12.  
22- Tsoucalas, 2016; 23(2): 212-13.



Treatise	Book Number	Contents
Περὶ ἐμπύρετων (Greek) On Fevers (English)		Lost treatise (based on the knowledge of the era: acute, nocturnal, malignant, etc).
Περὶ γυναικείων παθήσεων (Greek) On Diseases of Women-Gynaecology (English)		Lost treatise (based on the knowledge of the era: hysteria, breast diseases, womb affections, etc).
Περὶ φαρμάκων (Greek) On Drugs-Pharmacology (English)		Lost treatise (based on the knowledge of the era: various drugs based on herbs, animals, minerals, theriac, etc).
Περὶ χειρουργικῆς (Greek) On Surgery (English)		Lost treatise (based on the knowledge of the era: tracheotomy, laryngectomy, phlebotomy, lithoclastic cystotomy, trepanism, thoracotomy, abdominal, breast, etc).
Περὶ προφύλαξης (Greek) On Prophylaxis (English)		Lost treatise (based on the knowledge of the era: environment, climate, time of year, diet, etc).



Figure 3. Aretaeus of Cappadocia, portrait by Diamantakis Ioannis, 2004, and an ancient Greek bronze coin depicting a crab (Greek word for crap: *καρκίνος* = cancer), Greek city of Priapos in Mysia, ca 300-200 BC. The shape of the crab was, according to the ancient Greek physicians, similar to the fatal disease cancer, which “grasps” the affected areas.

Although Aretaeus, had realized that ascites was the main complication of the liver’s cancer, he had wrongfully believed that it could be cured through a massive urination, or bleeding and/or strong and prolonged sweating. He noted, “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. The patients,

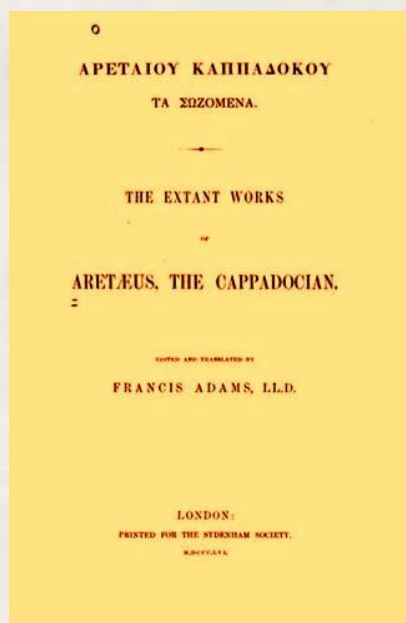


Figure 4. Aretaeus of Cappadocia, his saved 8 books treatise (Greek: Τα Σωζόμενα), front page, Francis Adams translation. London: Syndenham; 1856.



Figure 5. Aretaeus, *De causis et signis acutorum, et diuturnorum morborum libri quatuor*, front page. Edited by Hermann Boerhaave. Leiden: Janssonios Vander; 1735.



**Table 2:** Cancer types described inside the work of Aretaeus of Cappadokia.

N	Cancer type
1	<i>Colon cancer</i>
2	<i>Hepatic cancer</i>
3	<i>Spleen cancer</i>
4	<i>Kidney cancer</i>
5	<i>Neck cancer</i>
6	<i>Gastric cancer</i>
7	<i>Uterine cancer</i>

anorectic, dislikes 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 and exhaustion”<sup>23,24</sup>

Among Aretaeus’ wrong believes stands his view on spleen cancer, “spleen cancer is a common chronic disease. If the pus concentrates in great quantity, the tumor is soft, in most cases the pain is absent”. In the following fragments he wrote, “the disease appears in swap areas, due to filthy, static, salty waters. If a rupture occurs, the pus, ashy, like sediment flows, and an ulcer is formed. The ulcer persists, the patient is anorectic, ulcers appear in some areas of the body, mostly in lumbar areas, and patients overwhelmed die”<sup>25</sup> The chapter concerning the cure of spleen cancer is nowadays heavily fragmented. Among the saved fragments we may read “the cure is tough...means with similarity to fire, like a poultice of sifted powder of myrobalanus, or a mixture of vinegar and honey”<sup>26</sup>

Aretaeus (Figure 6), also wrote for the kidneys cancer, “ulcers could be corrosive, dirty, with bad odor, and white pus or blood flows blended with urine. The ulcers are spread in formation, and the cure is rather impossible”<sup>27</sup> Although he hadn’t named the disease as cancer, we could hypothesize it by the reference of the word “elkos” (elkos=ulcer), which in antiquity had the meaning of a malignant-cancerous ulcer.<sup>28-30</sup> The author supplemented, “the ulcers could cause corrosion of the area and could be clean, but most probably dirty, excreting pus with bad odor”<sup>31</sup>

Aretaeus inside his manuscripts had been referred to the malignant ulceration of the throat,<sup>32</sup> and the gastric cancer.<sup>33</sup> Fragments of his work presented malignant fatal “bad” ul-

23- Tsoucalas, 2016.  
 24- Hude, De curatione diuturnorum morborum, 1958.  
 25- Hude, De causis et signis acutorum morborum, 1958.  
 26- Hude, De curatione diuturnorum morborum, 1958.  
 27- Hude, De causis et signis acutorum morborum, 1958.  
 28- Kühn, 1830.  
 29- Reedy, 1968.  
 30- Karamanou, 2008: 601-8.  
 31- Hude, De causis et signis acutorum morborum, 1958.  
 32- Satyanarayan, 1953: 41-64.  
 33- Karamanou, 2009: 537-40.





cers inside the larynx and pharynx (references inside the fragments of diphtheria), as well as into the stomach (references inside the fragment of gonorrhoea), presenting a white (pus) flux of fluids with some blood clots inside, phlegm and diarrhoea.<sup>34-37</sup> Aretaeus was the first to describe uterus cancer, by noticing superficial and deep ulcers, which later infiltrated the uterus, “the lips of the ulcer are harsh and rough, there is certain offensive ichor and the pain is severe. The ulcer corrodes the uterus and sometimes a loose fleshy substance protrudes which does not cicatrize for a long time but occasions death...the veins in the uterus become swollen with tension of the surrounding parts”. He had also described another cancer type which does not present any ulcer, but which was rather a growth in the uterus. He distinguished between the two lesions and acknowledged that the symptoms and the prognosis of cancer types with ulcers were the most negative.<sup>38-40</sup>

- 34- Tsoucalas, 2012: 313-5.
- 35- Tsoucalas, 2004.
- 36- Hude, De causis et signis acutorum morborum, 1958.
- 37- Karamanou, 2009: 537-40.
- 38- Imbault-Huart, 1984.
- 39- Tsoucalas, 2013: 805-7.
- 40- Tsoucalas, 2015; 20(5): 1382-5.
- 41- Hude, De causis et signis acutorum morborum, 1958.
- 42- Maxwell, 2012: 100-1.

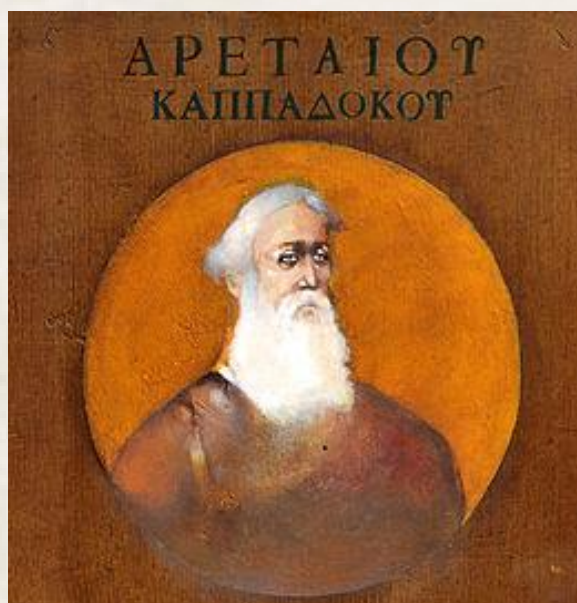


Figure 6. Aretaeus, oil on panel by Mahmut Karatoprak, 2015.

Surprisingly once more in accordance with modern studies, Aretaeus (Figure 7) understood that most cancer patients suffer from the unpleasant sensory and emotional experience of pain and that all forms of cancer, as chronic incurable pathological entities, “causes cachexia” (Greek: καχεξία), followed by physical decline before death.<sup>41,42</sup>



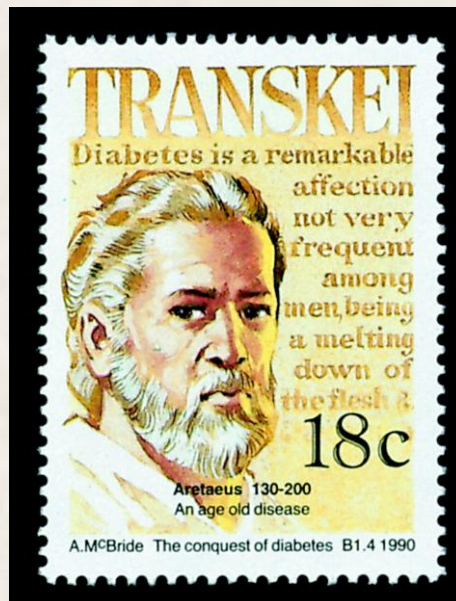


Figure 7. Aretaeus, South African stamp, 1990.

### Conclusion

Although Aretaeus did not emphatically mentioned the most famous of cancers, the breast cancer (possible reference inside his lost treatise “On Suregery”, a well known type of cancer at the era),<sup>43</sup> he was surely among the pioneers of the description of various malignancies, especially uterine cancer, by analyzing the macroscopic pathological image and symptomatology of various cancer types, contributing notably to further studies and understanding of this fatal disease.

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