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MINIREVIEW

THE GREEK MEDICAL EPISTEMOLOGY: AN EXAMPLE FROM NEUROSURGERY AT THE END OF THE 19TH CENTURY

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Abstract

Modern scientific Greek medicine traces its origins to the second half of the 19th century, aligning its development with the founding of the modern Greek state. During this period, the structures of education and science in Greece were organized as closely as possible according to the international standards of the era. Over time, the methodological rigor and scientific validity of Greek physicians became more comprehensive, and in certain cases, could be considered equivalent to international scientific standards. A notable example of such scientific approach can be drawn from the study and practice of neurosurgery at the end of the 19th and the beginning of the 20th century, at which time neurosurgery was still a branch of general surgery. This is illustrated by the case of a soldier's injury during the Greco-Turkish War of 1897, whose medical management stands as a distinct example of medical epistemology. This example demonstrates the comprehensive scientific approach to the patient by Greek surgeons.

Keywords: epistemology, neurosurgery, brain, traumatology.

Résumé

L'épistémologie médicale grecque: un exemple de neurochirurgie à la fin du XIXe siècle

La médecine scientifique grecque moderne fait remonter ses origines à la seconde moitié du 19ème siècle, alignant son développement sur la fondation de l'État grec moderne. Au cours de cette période, les structures de l'éducation et de la science en Grèce ont été organisées aussi étroitement que possible selon les normes internationales de l'époque. Au fil du temps, la rigueur méthodologique et la validité scientifique des médecins grecs sont devenues plus complètes et, dans certains cas, ont pu être considérées comme équivalentes aux normes scientifiques internationales. Un exemple notable d'une telle approche scientifique peut être tiré de l'étude et de la pratique de la neurochirurgie à la fin du 19e et au début du 20e siècle, à l'époque où la neurochirurgie était encore une branche de la chirurgie générale. C'est ce qu'illustre le cas de la blessure d'un soldat lors de la guerre gréco-turque de 1897, dont la prise en charge médicale est un exemple éloquent d'épistémologie médicale. Cet exemple démontre l'approche scientifique globale du patient par les chirurgiens grecs.

Mots-clés: épistémologie, neurochirurgie, cerveau, traumatologie

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Introduction

Modern scientific Greek medicine began in the second half of the 19th century, closely linked to the establishment of the modern Greek state. The educational and scientific structures in Greece were organized as much as possible according to the international data of the era. In medicine in particular, both the training and the practice of medicine followed the lessons of European medical advancements. Greek physicians, whether trained abroad or domestically, adhered strictly to scientific methodology[1]. Over time, the methodical approach and scientific validity of Greek physicians became more comprehensive, and in some cases could stand equally alongside the international scientific community. An example of such scientific rigor can be found in the study and practice of neurosurgery at the end of the 19th and the beginning of the 20th century, when neurosurgery was still considered part of general surgery[2].

The Othonian University of Athens and the intense writing activity that developed around it led to the development of Greek surgical works, which from translations of foreign works gradually progressed to original works that marked the school of surgery in Greece in the 19th century[3]. Over the years, the methodically and scientific validity of Greek doctors acquired a more comprehensive character and could in some cases stand on an equal footing in the international scientific field. We can draw an example of such scientificity from the study and practice of neurosurgery at the end of the 19th and the beginning of the 20th centuries, which neurosurgery at that time was part of general surgery[2-3].

The wounded soldier

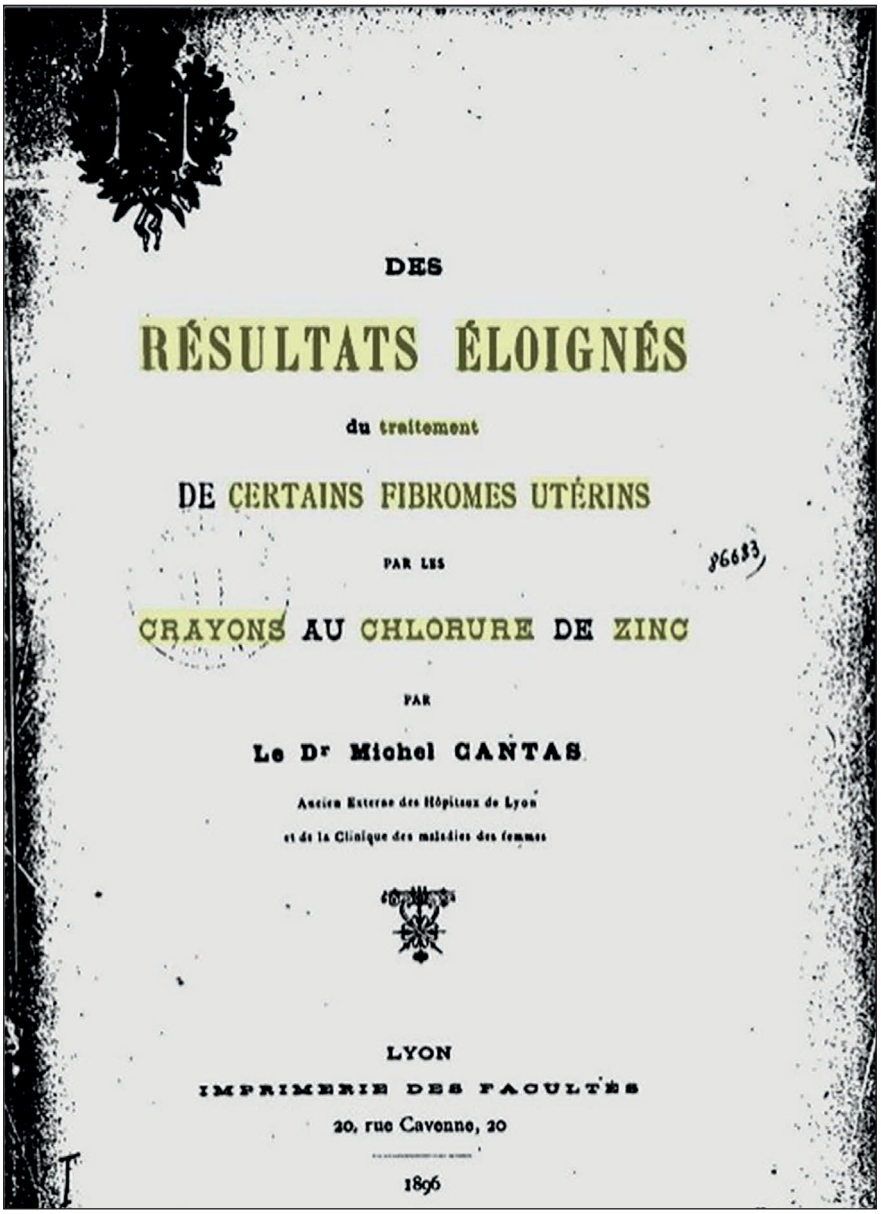
During the Greco-Turkish War of 1897 (Figure 1), the injury of a soldier became the subject of study for surgeon Michael H. Kantas, who presented it in detail at the *5th Panhellenic Medical Congress* in 1906[4]. Michael Kantas was a distinguished member of the Greek surgical community at the turn of the 20th century. He completed his secondary education in Marseille and studied at the Medical School of Lyon, following the advice of Professor Fotinos Panas (1832-1903), earning his doctorate in 1896 with a thesis on the long-term results of treating certain uterine fibroids with zinc chloride, titled "Des résultats éloignés du traitement de certains fibromes utérins par les crayons au chlorure de zinc" (Figure 2). In 1896, he was appointed lecturer in surgery and operative surgery at the University of Athens, and subsequently held several key academic and clinical positions, including at the University Surgical Clinic and the Military Hospital of Athens. He was also elected corresponding member of the Belgian Surgical Society in 1905 and the Surgical Society of Lyon in 1906[5].

In 1896 he was appointed professor of surgery and operative medicine at the University of Athens, supporting his thesis on the topic: "On appendicitis, especially from a surgical point of view"[6]. His work also had a direct impact on French surgery, where he is referred to in works of the time as a researcher with important observations[7]. In 1897, we find him at the University of Athens as curator of the Surgical and Topographical Collection of the University[8]. He served at the Medical School of the University of Athens from 1899 as Curator of the Chair of Descriptive Anatomy under Professor Georgios Sklavounos (1869-1954), from 1903 as Curator of the Chair of Surgical and Topographic Anatomy under Professor Evangelos Kalliontzis (1862-1922), from 1911 as Curator of the University Surgical Clinic at the Hospital under Professor Gerasimos Fokas (1861-1937), replacing him in his absence. In 1905, he was elected corresponding member of the Belgian Surgical Society and in 1906 he was also elected corresponding member of the Surgical Society of Lyon[6-9]. In 1910, we find his research published in French, "De la radiumthérapie dans les sténoses cicatricielles du conduit laryngo-trachéal"[10]. For the period from November 1912 to January 1915 he was head of the Surgical Department at the 2nd Military Hospital of Athens, holding the rank of reserve doctor (captain), succeeding professor Marinos Geroulanos (1867-1960). In 1912, we again find in French medical journals the extensive discussion of the method of administering anti-meningeal serum to a young woman using morphine, keeping the patient under anesthesia for one hour[11].

Returning to the case under study, on April 19, 1897, a 24-year-old soldier, Antonios Chronis, was admitted to the Red Cross Hospital in Volos after sustaining a gunshot wound to the skull from a Martini rifle. The bullet caused a perforating cranial injury, with the entry wound one centimeter above the midpoint of the right supraorbital ridge and the exit wound one centimeter above the uppermost point of the right auricle. The patient was comatose, unresponsive to all stimuli, with loss of sphincter control and discharge of cerebral matter from the wound. The frontal-parietal region exhibited depression with extrusion of brain tissue and palpable crepitus due to embedded bone fragments. There was swelling of the right eyelid and hemorrhage in the anterior chamber of the right eye. Due to the severity of the case, Kantas and his team immediately performed a craniotomy using a knife to connect the wound openings, but as the depression and extrusion of brain



Figure 1. The Battle of Velestino-The Greeks bringing in their wounded from the fighting line. Scientific American Supplement, June 12, 1897.


DES

RÉSULTATS ÉLOIGNÉS

du traitement

DE CERTAINS FIBROMES UTÉRINS

PAR LES

CRAYONS AU CHLORURE DE ZINC

PAR

Le Dr Michel CANTAS

Ancien Externe des Hôpitaux de Lyon

et de la Clinique des maladies des femmes

LYON

IMPRIMERIE DES FACULTÉS

20, rue Cavenne, 20

1896

Figure 2. Cantas M. Des résultats éloignés du traitement de certains fibromes utérins par les crayons au chlorure de zinc. Impremerie des Facultés, Lyon, 1896.

matter intensified, they used scissors to further open the area. This resulted in profuse hemorrhage, which ceased spontaneously. Upon cleaning the surgical field, they removed a pulpy mass of brain parenchyma and about thirty bone fragments of varying sizes. The area was irrigated with sterile water, removing additional fragments and brain tissue. In total, approximately seventy-five grams of pulped brain tissue were removed. A minor depression of the right orbital cavity was also noted. An antiseptic dressing was applied without suturing.

Postoperatively, the patient received ether and caffeine injections, remained comatose for four days, and was then transferred to the Central Military Hospital in Athens, where he continued to be treated by the military physician Ioannis Papatheodorou[12]. In Athens, Papatheodorou reported that the patient was managed conservatively with antiseptic wound care, from which cerebrospinal fluid drained for a week, and bone fragments and necrotic brain tissue for about a month. The wound healed after four months. The patient's clinical and cognitive condition remained extremely severe, with slow improvement. For the first two months, he was completely paralyzed and unresponsive; slight responses to physical stimuli began in the second month. By the end of the fourth month, he began to respond to verbal stimuli, albeit with incomprehensible speech. From the fifth month, he regained better comprehension, partial responses, limb movement, and sphincter control.

For the first two months, he was fed via esophageal catheter, regaining the ability to swallow thereafter. After five months, he was transferred to his home village, and Papatheodorou's follow-up ceased. In 1899, Kantas was astonished when the soldier visited him in Athens, fully ambulatory and healthy, to express gratitude for the care received. Kantas reported that the patient's recovery was nearly complete: full limb movement, sphincter control, mental clarity, and cognitive and sensory functions were restored to pre-injury levels. Reflexes were excellent, and there were no signs of psychological or emotional imbalance. The patient remembered everything up to the moment of injury, had amnesia for the five months of hospitalization, but memory was good thereafter. This condition persisted until 1900, three years post-injury. From then, he only complained of occasional mild vertigo, especially during intense mental work, as well as headaches, insomnia, palpitations, and slight memory weakness, none of which caused functional impairment. These symptoms persisted for eight years post-injury, during which the physician continued to monitor the patient[12].

What deserves our attention today is not only the management of the case throughout its course – both surgically and postoperatively – but also the research conducted by the physicians of the era with the means available to them, to explain both the patient's remarkable recovery after such a severe injury and the subsequent symptoms that developed. The scientific approach taken reflects the investigative zeal, sense of responsibility, and professionalism of Greek physicians of the time, who increasingly employed scientific methods to investigate medical phenomena in the field of neurosurgery, aligning their clinical and research work with that of leading international researchers. The 19th century led to research into gunshot wounds to the skull, to improve the high mortality rate in war and crime casualties. Could such a wounded person survive after skull surgery?[13] For these reasons and with the aim of answering the above question, Kantas, after conducting a review of the international bibliography of the time on the anatomy, physiology and traumatology of the brain[14], with his collaborators attempted through experimentation to interpret the patient's clinical picture, after first identifying the anatomical lesions in the brain caused by the bullet, linking these with the potential effects that they could cause on the centers of mental functions of the brain, as they had been mapped at that time and were located nearby or had been damaged by the injury, in order to identify the physiology of brain function and discover the pathophysiological mechanism after the injury that would give an image of both the healthy state and the neurological symptomatology of the injured person[14].

He achieved this goal by recreating the course of the bullet inside the skull and the damage it caused to the parenchyma in skulls of cadavers located in the Anatomy Department of the Medical School of the University of Athens by creating holes at the corresponding points with the bullet's entry and exit portals, having himself the exact image of the wound, being the first doctor to deal with the incident. Then, through the holes, he attempted to pass a thread, to identify the anatomical areas in which damage was caused. Having thus mastered the topographic anatomy of the specific injury, he compared the data with the findings on the physiology of the brain and the centers of mental functions using the findings of the international bibliography of the times and thus reached the following conclusions: i) The right frontal and temporal lobes can sustain extensive damage without causing any immediate, apparent motor, sensory, psychological, or auditory disturbance; ii) The supposed predominance of the frontal lobes in psychological functions, as posited by some physiologists, is not confirmed by our case; iii) Cognition is a function of the entire cortical substance of the brain; iv) The center for verbal deafness in the right temporal lobe can be destroyed without any evident disturbance of hearing in the corresponding ear; v) The superiority of the left temporal lobe in auditory function is confirmed by our case); vi) Late-onset vertigo unrelated to cerebellar or inner ear lesions is a consequence of circulatory disturbances of a cicatricial nature); Vii) Late-onset memory weakness is due to the expansion of compensatory neuroglial tissue formed around the scar, reducing the functional capacity of the brain; viii) Wide incision and craniectomy without suturing are indicated in perforating and contaminated brain injuries; ix) The outflow of cerebrospinal fluid can be abundant and prolonged without causing serious complication; indeed, it may often be advantageous by widely draining the wound.

Epilogue

This example demonstrates the comprehensive scientific approach to the patient by Greek surgeons, so that not only the surgical treatment and subsequent monitoring of the patient has the best possible care, but at the same time the medical discourse has been articulated with solid scientific arguments and constitutes an example of medical education. Kantas succeeded in the late 19th century in treating a skull wound from a firearm, remaining in the history of medicine as one of the first. Meanwhile, he had succeeded in interpreting anatomical, surgical and physiology terms promoting epistemology in an era when it was so much in need.

Author Contributions:

K.L. conceived the original draft preparation. K.L. was responsible for conception and design of the review. K.L. was responsible for the data acquisition, collection and assembly of the articles/published data, and their inclusion and interpretation in this review. K.L. has read and agreed with the final version of the manuscript.

Compliance with Ethics Requirements:

"The author declares no conflict of interest regarding this article"

"The author declares that all the procedures and experiments of this study respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2008(5), as well as the national law."

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