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Clovis Vincent (1879-1947): founder of French neurosurgery and promoter of oncologic neurosurgery

M. Karamanou[1], G. Androutsos[1], M. Lymperi[2], E. Stamboulis[3], I. Liappas[4], E. Lykouras[5]

[1]History of Medicine Department, Medical School, University of Athens, Athens; [2]Experimental Physiology Department, Medical School, University of Athens, Athens; [3]Department of Neurology, Attikon Hospital, University of Athens Athens; [4]First Department of Psychiatry, Aeginiteion, University hospital, Medical School, University of Athens, Athens; [5]Second Department of Psychiatry, Attikon University hospital, Medical School, University of Athens, Athens, Greece

Summary

The eminent neurologist Clovis Vincent decided to become neurosurgeon at an advanced age. His is considered the founder of French neurosurgery and the Europe's first neurosurgeon. He was mainly interested in pituitary tumors and his work on oncologic neurosurgery remains valuable.

Key words: Clovis Vincent, Joseph Babinski, Harvey Cushing, neurosurgery, neurology, oncological neurosurgery

The beginning years

Clovis Vincent was born at Ingré, Loiret, France on September 26, 1879.

During the first years of his studies at Orleans' high school, he was an independent character, having rebellious behavior. However, due of his fragile health, he ended to follow correspondence courses at home. The previously mediocre student was suddenly imposed in a strict work and he passed successfully his baccalaureate examinations.

Coming from a medical family, as his father Laurent-Frederick and his grandfather were both physicians, Vincent was enrolled in the Paris Medical School.

During his medical studies he was an attentive disciple, discerning quickly the tutors whose teaching would be beneficial; he drew out eagerly from their knowledge the necessary elements for his education, without being submitted to their influence thought [1].

Throughout his years of internship he was under the influence of the leading French neurologists Achille - Alexandre Souques (1860-1944), Joseph Babinski (1857-1932), Jean Nageotte (1866-1944), Fulgence Raymond (1842-1910) and Henri-Charles-Jules Claude (1869-1946) and at the end he decided to specialize in neurology. As master, he chose Babinski, since his style suited more to Vincent's character. In Babinski's teaching, the observation, the silence, the patience and the slowness or a scruple of expression were prominent [2].

In 1909, after a competition, Vincent received the

The eminent neurosurgeon Clovis Vincent.

gold medal for internship, spending an additional year with two great Professors, Marie-Émile-Anatole Chauffard (1855-1932) and Georges-Charles Guillain (1876-1961), while he sacrificed part of his time to complete his doctoral thesis entitled: *Chronic syphilitic meningitis. The nerve damage of the brain* (1910) [3]. In 1913, he was appointed hospital physician and settled down as assistant to his master Babinski.

During the World War I he was assigned, at his request, to an infantry battalion. At the end of 1916, he deliberately left the Neurological Center for the Army in Tours to return to the front and received the Legion of Honor for his military exploits. The war offered to Vincent several opportunities to show some originality in the practice of medicine. As neurologist, he would be as original and brave as he was at the front, and particularly austere against cheaters. Trained before the war to detect hysterical and disease simulators, he discovered a large number of rogues who imitated the symptoms, stood resolutely away from the fighting, filling the hospitals of the rear [4].

For this reason, he invented the torpillage (torpedoing). *Torpillage* was the term chosen by soldiers receiving the treatment because they likened the electric part of the therapy to being hit by a shell (une torpille) [5].

He administered a sharp galvanic current (100 to 120 milliamps) to the soldier's body so that the later would distinguish between the physical reality of pain and his traumatized state of mind [6].

However, during the painful phase, soldiers often rebelled. They would shout, struggle, and insult the doctor. One of them, Deschamp, was prosecuted for refusing treatment and assaulting an officer. Medical opinion was divided over this affair: some more sympathetic specialists attempted to show that Deschamp was not directly responsible for his violence, this being due to the "torpille" treatment.

The public supported Vincent and expected the malingering Deschamp to be convicted. But the verdict was in Deschamp's favor and he was awarded an exemption from service with pension, although he was to remain under strict medical supervision.

Deschamp's affair made headlines between June 1916 and August 1917. At no point in the trial was Vincent's reputation called into question; it seemed that the whole of France supported the brave doctor, champion of the patriotic ideal [7].

Paul Lecène and the beginnings of oncologic neurosurgery in France

Babinski introduced, in some way, neurosurgery in France from Sir Victor Horsley (1857-1916). In particular, in 1887, Horsley removed successfully a tumor compressing the spinal cord. The battle was won. Being a physiologist, Horsley, practised surgery by operations on monkeys, and managed at last what had been so ardently desired by the previous generations [8].

Then, one morning in 1910, Paul Lecène (1878-1929) arrived at Neuilly Clinic, in order to perform under Babinski's clinical indications, the first neurosurgical operation in France. The patient was an old lady. She was suffering from lower limbs paralysis which persisted for several years due to compression of the spinal cord by a "little voluminous and non-cancerous structure, tumor without doubt" [9].

In the operation room, Babinski, based on the presented clinical signs, traced with a dermographic pencil the probable site of the compression. The Professor of Surgery Bernard Cuneo (1873-1944), who came to see his younger brother to operate, stood close to Babinski. There were gathered for a bright moment, three of the best minds of the time in medicine and surgery. Lecène performed the operation with the ease of a trained anatomist, having the zeal of a deeply compassionate man. Many admired the surgical procedure, which involved reaching of the spinal cord and removal of the tumor, while the assistants were astonished by the virtuosity of Babinski, the great neurologist, who knew to detect, without x-ray assistance, the localization of the lesion. Days later the patient felt, for the first time, one of the punctures made in one of her thighs: it was the hoped revival of a sensibility and a few more days later she could make small movements with her legs which had been paralyzed for so long. Then, little by little, there came the complete healing [10].

The results of the operation were published in 1912, three years after Lecène had introduced other innovations in France: his surgical procedure on the pituitary and on cerebellum.

Vincent: leading expert on brain tumors

The essential for Vincent was to show the insignificant symptoms that the patients suffering from brain tumors may present for months. Vincent imagined a catalogue where there could be classified, in their apparent and misleading banality, the phrases that the patients or their relatives use. He loved to multiply examples as: headaches, nausea, dizziness, fatigue, moaning, while other times, intermittent cramps in a limb, nocturnal headaches, temporal torpor, or even pupillary, palpebral and commissural asymmetry. The more the implausibility was brought up, the more insisted: vomiting, weak

legs, speech difficulties, some syncopes, titubation, unusual cheerfulness, gaps in memory, brief obnubilation, recent obesity, vertigo in certain positions, olfactory hallucinations, etc. This is a list where we can see the most misleading signs, some from their seat, others by their apparent benignity: indifference mistaken for selfishness, excitation misleading to euphoria, aboulia taken for detachment, yawning, hiccups, haemorrhage, abdominal pain crises called digestive problems, car accidents blamed on distraction, abnormal thirst, change sizes of shoes and gloves etc.

Where unaccustomed doctors would have seen some discomfort or negligible symptoms, Vincent took an extended pleasure to show the significant scope of the simplest language, the great interest in the examination of patients, the need to stop to what at first may seem insignificant or trivial [10].

Thierry de Martel comes on stage and takes Lecène's place

After the end of World War I Vincent returned to Paris as war hero, entered the service of his master Babinski and began a new series of work. This prodigious amount of clinical and nosologic progress achieved by the predecessors did not seem to him as real relief. Instead, he realised the profound joy that could give the surgical successes achieved in America and England against the so-called incurable tumoral lesions.

In this regard, Vincent had asked, before the war, his friend Thierry de Martel, with whom he was intern in Salpêtrière, to operate some brain tumors, what Babinski had taught him in foreign trials. Gradually, thanks to Vincent and other Babinski's students, Jean-Alexandre Barré (1880-1967) and Auguste Tournay (1876-1969) in particular, Martel became the Babinski's neurosurgeon. As for Lecène, he decided to quit as he could no longer perform both general surgery and neurosurgery [9].

Martel "did everything he could", Vincent wrote, to be aware of neurosurgery of that time. He went to see, in fact, the masters of the specialty, Horsley and Harvey Cushing (1869-1939) and soon he had many patients to treat. He operated the second spinal tumor that has been cured in France. In addition, he advocated the local anesthesia and surgery in the sitting position. Martel was a great practitioner. In his art, which he loved and he willingly spoke about to laypeople, he was pointed out for his desire of priority, some technical improvements, and his mechanic ingenuity. He proved his modesty, by agreeing to be under the intellectual direction of neurologists, prisoner of their diagnoses and simple executor of their prescriptions. Martel was, for a few years, one of the two leading neurosurgeons of Paris; for brain tumors almost the only one [9].

After the war, the efforts of Jean Sicard (1873-1929) –discoverer of a test for the location of spinal tumors– and Maurice Robineau (1870-1950)-admirable anatomist and surgeon-had arisen. With patience, skill, impeccable safety, meticulous precautions, Robineau turned in a very short time a perfect operator on spinal tumors. For this kind of lesions, in particular, his statistics fascinated quickly, joining in quality level the most honorable in the world. Babinski and Clovis Vincent were disappointed by the severe postoperative recoveries of their patients, although aware of the foreign statistics and Robineau's success foreseeing the days when the neurologists' discouragement, after many lesions, would not be forgiven and when the success of Horsley and Cushing could be perfectly equal in all countries. It was the time that all patients with a brain tumor succumbed after having suffered from crippling headaches. Any patient suffering from paralysis due to tumoral compression of the spine, even histologically benign, could not leave his bed where he had to pass very miserable years, before being defeated by painful complications. For the majority of such patients, the situation in several countries began to be reversed. Their cure, in some cases and by certain people, became one of the least uncertain problems of neurosurgery [10]. So, why was France slow?

Vincent becomes a neurosurgeon and creates oncologic neurosurgery

On several occasions already, Babinski prompted Vincent to operate his patients himself, in order to be a person capable of both diagnosis and treatment as well. But could Vincent consider as a valid surgical vocation the pleasure of some emergency operations performed when he was an intern on call, when needed to help a surgeon of Pitié or the curious lack of hesitation when it came to operate his hunting dogs?

Since 1926, he was saying to his students that there was a new neurology, born and developed in the United States, which he promised to teach them. It was created and perfected by surgeons gradually specialized in this pathology and this kind of interventions, who at the same time became very capable neurologists not only to discover the deepest and smallest damage of the organ, but also to interpret, as they should, the disorders, while operating. He lamented that this kind of surgeons did not exist in France. In 1927, Vincent and Martel went together to the USA. Vincent stayed for six weeks next to Cushing and thanks to his intelligence he

was able to review innovative methods of the American neurosurgery. However, despite the repeated exhortations of his master Babinski and the pressing ones of Cushing, he had not yet thought to operate himself [11].

Returning to France, he was engaged in a report that he took on, treating the frontal brain tumors. That gave him the opportunity to review the statistics of the patients operated on for this condition. He checked with disappointment that the postoperative mortality was reaching 60%, while at the same time in America, for similar lesions, it was only 10 to 20%. After some new disappointments, he came to the biggest decision of his life: "I began to understand" he said one day with frank immodesty "that the mortality is not going to be decreased unless I operate myself". He was 48 years old, he had never learned the gestures and disciplines of surgery, and he was in a privileged situation as very eminent and much admired neurologist. But what was important to him was the safety of his patients! He now had a new master and model, Cushing. So he started his own neurosurgical education. With the progress he was making he was only thinking of using instruments, of handling stitches, sutures, ligatures and separations. The scholar was becoming craftsman [2].

For him, Cushing was the real creator of neurosurgery and especially of modern oncologic neurosurgery, whose influence proved to be universal.

The neurosurgeon knew how to remove the brain tumor in order to restore the sight of a blind, the balance of a disoriented, the hearing to a deaf man, the reason to a demented, the health to a dying man and the activity to a bedridden. We call gliomas some of the most malignant tumors, meningiomas, neurinomas, some of which do not relapse after a well conducted operation. Others have a less common designation, as for example astrocytoblastomas.

Vincent knew nothing of the magnificent work of Cushing when he saw him; but what he especially learned was the precautions of delicacy, detail, perfection of haemostasis and suturing, which must be taken to act without harming and operate as a master. Cushing had invented the *clips*, very small metal staples tight on the bleeding vessel and left there. He also invented in neurosurgery, the use of *electrocoagulation* in bleeding vessel [12].

Vincent became a neurosurgeon shortly before turning 50 years old. Why had he thought of this new orientation after the halfway of his life? Disappointed, as he often repeated, by the results of the French neurosurgery which remained seriously back comparing to those obtained and published by foreign surgeons, he decided to take the scalpel himself, not without measuring the risks though.

So, Vincent expected to be both the person who is responsible for the diagnosis and who handles the surgical instruments, the scholar and the craftsman as well.

The year 1928 was very important for Vincent; he began to operate and also published a report on tumors compressing the frontal lobe, in which he could state, on a personal statistics of 15 cases, 13 accurate diagnoses. We must mention, what Vincent rarely said, that Martel had cured 6 out of 13 patients, a number less disappointing than one could suppose. In his clinical picture, Vincent attempted to do for the frontal lobe what Babinski had done for the cerebellum; the meeting of the less unfaithful signs in a striking syndrome. Instead of following the classic grouping, psychic signs, balance disorders, coordination and mime, he proposed the following triad to be added to the signs of cranial hypertension: facial paralysis of the central type, more or less pronounced aphasia, and early mental health problems. On May, 1928, Vincent, assisted by surgeons, operated on his first patient suffering from an intracranial cyst. Vincent treated him and 11 years later he was happy to know that he was still healthy. From May 1929, he had no need to have an expert surgeon next to him. He thought he became surgeon, in a year, and now he operated with his interns [9].

From May to July 1929, he treated 25 patients and managed to remove a series of tumors (craniopharyngioma, pituitary adenoma approached by the frontal way, meningioma of the sphenoid, cerebellar astrocytoma, hemangioma of the calamus) whose removal has never been attempted or achieved in France [2].

The quality of his results prevailed over those that where known in France. The neurosurgery department of the Pitié hospital was created in 1933, one year after Babinski's death, which had seen there the climax of his career. Vincent with all his perseverance and his authority worked to render this creation a quick success.

In a very short time, the French statistics were almost reversed. Instead of having a mortality rate of 60 to 70%, now it was the percentage of success reaching from 70 to 80%. He taught his students how to entirely eradicate lesions, which until before were considered as unapproachable or ineradicable. He expanded his school every day and prepared disciples patiently or impatiently. Solitary, independent, irritable, violent, he was not less considered very favorably among his peers. Thanks to him, already some tumors had no more the gravity that once darkened their evolution if we think about the meticulous movements it takes to reach a tumor, sometimes deeply buried, without decay, without supported moving, without tightness or hemorrhage. Considering that the slightest pressure, a bit abrupt on this crumbly brain texture, could cause limp paralysis,

breath cessation, fatal fall in blood pressure, sudden onset of epileptic seizures or, more impressively, the so horrifying oedema which rises before the operator's eyes as a real tide, it gets obvious what represents the effort of a physician, even a master, to become a surgeon in the age of 50 years, so that 2 years later he would be the first specialist in his country and one of the top 3 in Europe [2].

When he was asked to define the reasons of his wonderful achievement, his reply was in honor of his honesty as much as his simplicity: " If I have succeeded, is because I knew how the brain was made; I saw in place each different region; I knew the vessels; I knew the microscopic anatomy of its tumors, its physiology; I suffered with the brain during operations. A mechanical conception of neurosurgery is absurd; a biological conception is also needed; the brain must be treated as the most sensitive and most vindictive of the living organs" [2].

Vincent had to travel again to Boston in 1930. His friendship with Cushing and their mutual admiration were more firmly sealed and Cushing learned with astonishment that, on the boat, Vincent had spent hours practising for more and more difficult catches, dissecting forceps or sewing pieces of cloth, educating humbly his fingers. The American surgeon considered already his French friend as the first neurosurgeon of Europe. As he repeated: "Will you become Professor?" Vincent replied: "No! This is impossible!" He wanted to inform Cushing that in Paris the custom was to choose the Professor among the associate Professors. However, Babinski and Vincent had shown aversion for the aggregation. The failure of the first outraged in retrospect his beloved student [9].

Vincent could be regarded as one of the less hesitant and changing men, according to their judgments. Which would be his reaction, some of his friends wondered, to such a proposal? Finally, he was appointed by the Council of Professors, consisting of 40 to 50 voters. Its members did not care whether he had or not the title of associate Professor, they just wanted to entrust the chair to the man whose culture, personal work, influence and character were unquestionable. To get a unanimous vote, Vincent did not need to count on the power of intrigues [2].

It is true that Vincent was hardly concerned in his life for people's judgments except three: his own, that of Babinski and that of Cushing. When he wanted to remember happy events, he stuck to two memories: the first was when Babinski, one day in 1930, after having watched him performing skillfully a difficult tumor extirpation, said to the assistants, with a shudder of happiness: " Gentlemen, you can not see anything more beautiful!" The old master was undoubtedly pleased, at the same time, to have lived long enough to see the progress of neurology and the fundamental contribution of his best student. Another day, in 1936, Cushing came to the Pitié hospital to see his friend Vincent; he no longer left him ignoring that he held him in high esteem. We know, thanks to Le Beau, the last favorite pupil of Vincent, the moving letter that Cushing had written to Jefferson after that morning: " The next day back to the Pitié hospital, I saw Vincent, to my astonishment, in a quiet room, with nothing more than a few carefully selected instruments and an admirably organized team, removing a pituitary tumor from a child, without saying a word, except some encouragement to the patient from time to time. This was a great example "[2]. After this contact between the two men, the Rockefeller Foundation, informed by Cushing, invested the money that would allow the creation of the chair in Paris.

The new Professor gave his first lecture a few months before Cushing's death, on January 26, 1939, before a large audience.

In his speech, addressing doctors and theorists, he blamed them to be too often late in the diagnosis of curable tumors. He promised an education designed to facilitate less questionable information and more expedient decisions. The promises of education had not been sufficient for the new Professor. He had to enrich constantly the methods of functional and physical exploration of the nervous system, as well as the curing techniques, the post-operative therapeutic care, and the experimental procedures. Before concluding, he was pleased to show what neurosurgery had brought to neurology [10].

When closing his long lecture, Vincent urged his colleagues to "become this race of rare men whose essential purpose is to overcome suffering and death" [2].

On many neurological issues, he continued to inspire his students: for example in tumors of the corpus callosum, cerebellar hemangiomas, acoustic tumors, suprasellar meningiomas, optic chiasm glioma and craniopharyngiomas [8].

Discussion

Clovis Vincent realized his dream, conquered by the force of truth, intelligence and energy. Posterity will not ignore the scientific papers that owes to him, the models of reason and the new surgical procedures. Having established a school, built a center of research, he remained, from the first to the last day in science, an example of investigative rigor [4].

After the World War II, he was quite changed,

weighed, with significant pallidness. In 1947, he had to abandon the department he had created, animated and rendered famous, to terminate functions on which he had ceaselessly consecrated his strength and time. Fierce solitude became necessary for him. He was not seen any more and in a rather tragic approach, we were thinking the words of his moving tribute to Babinski, a few months after his death. "...He stopped coming to the sessions. It seemed that as champion that he was, feeling weak, he did not want to interrelate with the men before whom he had fought and won" [9].

According to Dr. René Moreau, who treated him, he was quite at the end of a disease that had its share of mystery "In the last hours, his stubborn and creative soul, releasing the sufferings of the exhausted body, did not linger the vain life regret. Vincent wanted to force the future and ensure the continuity of his work beyond himself, make it survive in the heart, thought, and actions of those he had awakened to the neurosurgery..." [2].

Epilogue

Neurosurgery was really born the day that Cushing proved that the neurosurgeon had to be at the same time a surgeon, a neurologist and a biologist. France owes this triple guarantee of recognition for the first time to Clovis Vincent.

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Correspondence to: George Androutsos, MD, PhD. 1, Ipeirou Street, 104 33 Athens, Greece. Fax: +30 210 8235710, E-mail: lyon48@otenet.gr