

Special Article

Professor Jean-Nicolas Corvisart des Marets (1755-1821): Founder of Modern Cardiology

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Professor Jean-Nicolas Corvisart des Marets, personal physician of the Emperor Napoleon 1st and Baron of the Empire, is considered to be a pioneer in cardiology and one of the leading figures to promote the anatomo-clinical method in medicine. His main contribution to cardiology consists in the adoption and popularization of the dormant Auenbrugger's chest percussion technique.

In the first century AD, Pliny the Elder (23-79) stated: "The heart is the only internal organ which disease cannot touch".¹ This belief remained popular till the early 19th century. After the end of the French Revolution, Parisian medicine rose from its depths to a new height of prominence. New ideas began to prevail and medical teaching was entirely renovated and unified. Following the teachings of Giovanni Batista Morgagni (1682-1772) and placing emphasis on morbid anatomy, Paris became the Mecca of physical diagnosis. The greatest representative of that period in medicine was Jean-Nicolas Corvisart, professor of the Medical School in Paris, physician of Emperor Napoleon 1st, responsible for the popularization of the chest percussion technique, outstanding diagnostician and founder of clinical cardiology.

Corvisart's life and career

Corvisart was born in the French village of Dricourt, Ardennes, on February 15th, 1755. At the age of 12, Jean-Nicolas entered the celebrated college of Sainte-Barbe, as his father Pierre Corvisart wanted

him to become a lawyer.² It is by chance that one day he entered the anatomy amphitheatre where Professor Antoine Petit (1718-1794) was teaching. Immediately fascinated, he convinced his father to let him follow a medical career. During his studies he dissected several bodies in the Hôtel-Dieu Hospital and he focused on morbid anatomy. Having as professors the founders of clinical study in France, namely Félix Vicq d'Azur (1748-1794), Desbois de Rochefort (1750-1786), Antoine Portal (1742-1832), Antoine Petit (1718-1794) and Pierre-Joseph Desault (1738-1795), he received his doctor's degree in 1782.³

Corvisart (Figure 1) was stocky in stature, vigorous in manner, outspoken, honest and generous to the poor. His aversion to tradition was responsible for his failure to work after graduation in the Hospital of Paroisses, newly founded by Necker; he refused to wear the powdered wig that went with the position and Mme Necker opposed his nomination as doctor.⁴ He started his career as a physician in the poor neighborhood of Saint Sulpice in Paris. He soon became distinguished for his personality and his skills as a clinician. Gradually climbing the rungs of

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Figure 1. Baron Jean-Nicolas Corvisart (1755-1821).

the hierarchical ladder, in 1783 he was appointed to teach physiology, surgery and obstetrics in the medical school. In 1786 he was named professor of clinical pathology and in 1795 he was elected to the Chair of Clinical Medicine in the newly-founded medical school at the Charité Hospital in Paris.⁵ He was an excellent clinician; his innovative method of teaching was not based only on theory, but also on the detailed bedside physical examination of the patient. In his department, patients were divided into different pathologies under the supervision of an assistant, who was responsible for presenting his daily observations on patients' health status to the head of the department and his assistants during the ward round; this kind of ward round has remained standard until today.⁶

In 1801, during a reception at Barras' house, Corvisart was presented to General Napoleon Bonaparte (1769-1821). The General's wife Josephine asked Corvisart, "To what disease do you think the General is most likely to be exposed?" "To a disease of the heart," replied Corvisart. "Have you written a book on that?" asked Napoleon. "No but I intend to publish one soon". "Then lose no time, we will speak

on this later".⁷ A few years later, in 1806, Corvisart was to publish his manuscript entitled "*Essai sur les maladies et les lésions organiques du cœur et des gros vaisseaux*", which represents the first treatise of modern cardiology (Figure 2).

Thanks to his reputation, Corvisart became Napoleon's personal chief physician.⁸ In 1808 he was ennobled, receiving the title of Baron of the Empire, and in 1811 he was admitted as a member of the Academy of Sciences. The admiration of Napoleon toward Corvisart was so great that he used to say, "I don't believe in medicine but I believe in Corvisart."⁹

In 1808, Corvisart reintroduced the method of chest percussion in clinical diagnosis, translating Leopold von Auenbrugger's manuscript "*Inventum Novum*" from Latin into French under the title, "*La nouvelle méthode pour reconnaître les maladies internes de poitrine par la percussion de cette cavité*".¹⁰

Corvisart retired at 60 years of age. After the fall of the Empire, he had his first episode of apoplexy, which caused a hemiplegia. He died on September

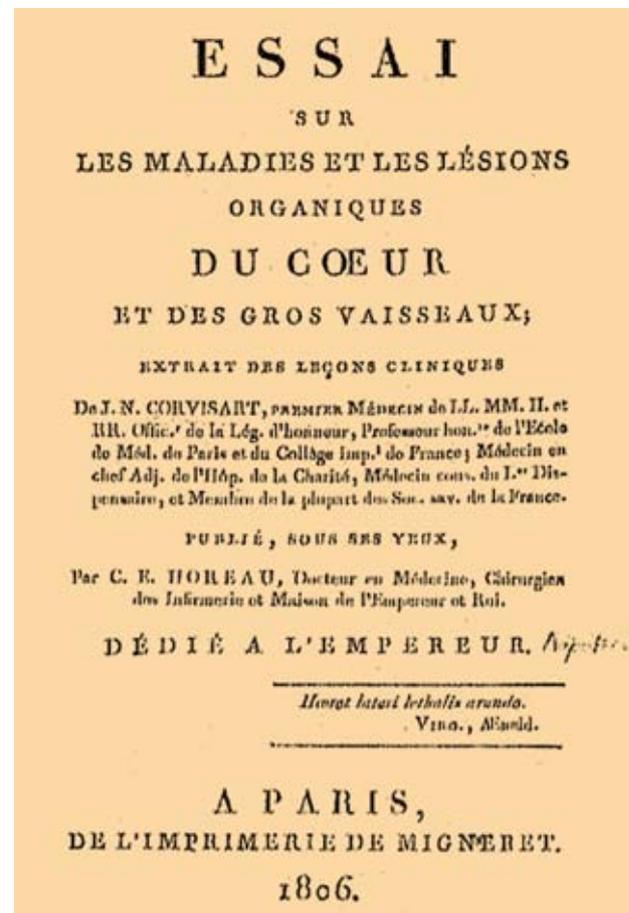


Figure 2. Frontispiece of Corvisart's essay on heart diseases.

15, 1821, in his house after a third attack of apoplexy, four months after the death of Napoleon.⁵

Corvisart: founder of clinical cardiology

Corvisart's medical practice was based on the anatomo-clinical method and he focused on cardiovascular diseases. The result was the "*Essai sur les maladies et les lésions organiques du cœur et des gros vaisseaux*" (Figure 2), published in 1806 and dedicated to the Emperor Napoleon 1st.

Although the heart's dilatation and hypertrophy had been described many times before, Corvisart analyzed the difference between these two processes. He used the term 'aneurysm' to describe cardiac enlargement, indicating that enlargement of the heart and aneurysmal dilatation of an artery were quite different processes. He distinguished the aneurysms as "active" and "passive"; in both the heart was dilated, but the "active" consisted of enlargement, hypertrophy, with the force of contraction increased, whereas the "passive" type did not have hypertrophy and had a diminished force of contraction.¹¹

Under the title "signs of aneurysm of the heart in general", he gave an excellent description of three stages of what would now be called heart failure. In the first stage, the patient would be complaining of breathlessness on exertion and palpitations without any evidence. That stage was characterized by cardiac enlargement on percussion. In the second stage, ankle edema was present but disappeared overnight or, if it was more persistent, might be temporarily relieved by medicines. The dyspnea on exertion was worse and might also be present at rest, especially if the patient was lying down. The third stage was characterized by coldness of the limbs, delirium, especially at night, swelling of the veins in the neck, tender enlargement of the liver and massive edema. Regarding treatment he was pessimistic: blood-letting or a change in the patient's life style would serve for the first stage but for the second and third stages no treatment was possible.¹²

Corvisart was convinced that patients suffering from heart disease were often misdiagnosed as suffering from other conditions, as dyspnea, often labeled "asthma", was usually attributed to disease of the lungs rather than of the heart.

He classified the pathological entities of the heart into six categories:

1. Cardiac chamber enlargement with thickening of the wall. Under this group, he included four types of enlargement according to location: a)

dilatation of the entire heart, b) dilatation of the left auricle, c) dilatation of the left ventricle, d) dilatation of the base of the aorta or of the right side of the heart.

2. Cardiac chamber enlargement with thinning of the wall. This group also had four subdivisions in the same manner as in the first category.
3. Decreased cardiac chamber size. This was further subdivided into: a) decrease in the size of any one of the four cavities separately, b) simultaneous decrease of all four cavities, c) constriction of the origin of the great vessels.
4. Lesions of the valves of the heart or great vessels, with the following sub classification: a) hardening or calcification of the aortic valve, b) calcification of the mitral valve, c) stenosis of the auriculoventricular opening, d) calcification of the base of the aorta or the right side of the heart.
5. Cardiac disease due to foreign bodies: a) intracavitary polyps, b) calcifications, c) vegetations on valvular surfaces.
6. Abnormal perforation. This was his term for congenital malformations. He recognized only two and he referred to them as: a) persistence or dilatation of the duct of Botallo, and b) perforation of the interventricular septum.¹³

In his discussion of septal defects in general, he recognized that cyanosis was due to right-to-left shunt. He pointed out that the direction of the shunt depended on the "energy" with which the left and right chambers of the heart contracted. Corvisart was also the first to conceptualize pericarditis. In his essay he described fibrinous pericarditis, after *post mortem* examination, explaining that "the massive deposition of fibrin caused the pericardium to resemble the reticulum of the second stomach of the calf." He also noticed the massive pericardial effusion, in which the pericardial sac contained four liters of fluid. Corvisart recognized the existence of what we would categorize today as specific forms of pericarditis, especially those forms due to tuberculosis. Also, he made a clear distinction between the "osseous asperities" of calcific valve disease and true vegetations. He likened the appearance of the latter to that of venereal warts and discussed the possibility that such soft vegetations might be of syphilitic origin.¹¹

Corvisart: promoter of chest percussion

Corvisart was responsible for the popularization of Leopold Auenbrugger's technique of percussion, an impor-

tant element of physical diagnosis. Leopold Auenbrugger was born in 1722 in Austria. Son of an innkeeper, he adopted the habit of tapping the wine barrels in his father's inn to determine how much wine they contained. He became one of Vienna's most distinguished physicians. It was in 1754, while he was working in the Spanish military Hospital in Vienna, that he conceived the method of thoracic percussion in order to be able to judge the condition of the underlying organs on the basis of the sound. In 1761 he published his invention under the title, "*Inventum novum ex percussione thoracis humani ut signo abstrusos interni pectoris morbos detegendi*" (a new discovery that enables the physician from the percussion of the human thorax to detect the diseases hidden within the chest).¹⁴ Percussion consists of striking the patient's chest sharply with slightly curved fingers. The quality and pitch of the sound vary according to whether the region beneath the percussing finger is hollow or solid. A hollow sound indicated a healthy chest and a dull, flat sound was the sign of the disease. As a diagnostic tool, percussion was of particular value in conditions involving the thorax, such as enlargement of the heart, consolidations of parts of the lung from pneumonia, or collection of fluid in the lungs or around the heart. The technique went unnoticed by Auenbrugger's contemporaries and it was in Paris that Professor Corvisart realized the value of the method. In 1808, Corvisart translated Auenbrugger's work into French and added his annotations.¹⁵ The original booklet of 95 pages became a volume of 440 pages and percussion took its place in Charité Hospital. It helped Corvisart to identify cardiac enlargement, collection of fluid around the heart, and effusion in the lungs secondary to heart failure.¹⁶

Corvisart's legacy

As a pioneer in clinical cardiology, Corvisart's name has been attached to a number of syndromes: 1. Corvisart facies: the characteristic appearance seen in cardiac insufficiency or aortic regurgitation, consisting of a swollen, purplish, cyanotic face with shiny eyes and puffy eyelids; 2. Fallot-Corvisart syndrome: a Fallot Tetralogy of Corvisart type, having a right-sided aortic arch (presented in 20% of the cases); 3. Corvisart's disease: clinical hypertrophic myocarditis.¹⁷

Corvisart was one of the main contributors to the anatomo-clinical method and left a legacy of dis-

tinguished pupils and successors, such as François Xavier Bichat (1771-1802), the founder of histology, Pierre Brettonneau (1771-1862), the founder of epidemiology, Jean-Baptiste Bouillaud (1796-1881), who first described the cardiac manifestation of rheumatic fever, Guillaume Dupuytren (1778-1839), the greatest surgeon and pathologist of his era, Jean Cruveilhier (1791-1874), famous pathologist and anatomist, and René Laennec (1781-1826), great clinician and inventor of the stethoscope.⁷

Corvisart's research in the field of cardiovascular diseases contributed to the creation of modern cardiology and for this reason he is considered as a great pioneer of this discipline.

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