

RENÉ LERICHE AND THE DEVELOPMENT OF 20TH CENTURY SURGERY

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Abstract

René Leriche (1879-1955) was a 20th century French surgeon generally known in medicine for the syndrome that carries his name, namely the Leriche syndrome in the aorto-iliac occlusive disease.

This paper is published to mark the commemoration of 60 year since Leriche's death.

Although Dr. Leriche's legacy resides in the domain of vascular medicine, his research enclosed bone pathology and surgical management of pain.

Having his surgical training done under professors Mathieu Jaboulay and Antonin Poncet, his friendship and association with Alexis Carrel and William Halsted have contributed to René Leriche's development as a surgeon, researcher and thinker. Following the footsteps of his mentors, he produced outstanding clinical and academic work which had earned him a good reputation among his students and colleagues. Surgeons such as Jean Kunlin, Jao Cid dos Santos, Michael DeBakey, René Fontaine and others came to study and learn from him. These future generations of surgeons would themselves bring much contribution to the understanding and treatment of vascular diseases and medicine in general.

René Leriche pioneered medicine with his research and ideas. His assiduous work of teaching, research and clinical practice made his influence last to our present.

Keywords: Leriche, surgery, 20th Century

Introduction

René Leriche was a 20th century French surgeon generally known in medicine for the syndrome that carries his name, the Leriche syndrome in the aorto-iliac occlusive disease. Although Dr. Leriche's legacy remains in the domain of vascular medicine, his research comprehended bone pathology and surgical management of pain. His outstanding clinical and academic work earned him a good reputation among his students and colleagues, leaving his mark on future generations of bright surgeons such as Jean Kunlin, Jao Cid dos Santos, Michael DeBakey, René Fontaine and others.

History

René Leriche was born in 1879 in the city of Roanne, central France. In 1906 he received his medical

degree from the University of Lyon with the thesis "*The Resection of the Stomach for Cancer*" [1,2].

While in Lyon, he was a colleague of Alexis Carrel (1873-1944) until Carrel's departure to Montreal in 1904. They were both pupils of Professor Mathieu Jaboulay (1860-1913) who performed at the end of the 19th century an experimental end-to-end arterial anastomosis in dogs [1,3].

Between 1906 and 1909 Leriche was appointed Head of the Surgical Clinic in Lion [4]. During World War I, he continued his surgical activity as a camp surgeon [5,6] where he came into contact with trauma and post-traumatic pain, leading him eventually to continue his research on vascular pathology and pain management [2] with the future addition of bone pathophysiology and treatment [1].

In 1916 he suggested treating post-traumatic pain after peripheral nerve damage by periarterial sympathectomy [7]. Two years later he published

Manuscript received: 03.09.2015

Received in revised form: 20.09.2015

Accepted: 20.09.2015

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"Treatment of War Fractures" [8]. After the war he became "hospital surgeon" and was appointed lecturer of experimental surgery in Lion [4].

The cluster of symptoms known today as the Leriche syndrome, specific for aorto-iliac occlusive disease were first observed in 1923 [9] and were to be investigated for the next 17 years [10].

The year 1924 meant promotion and opportunity for the French surgeon to share his experience as he would be called to Strasbourg to teach as professor of clinical surgery. During this period his clinic was "a place of pilgrimage for surgeons from all over the world" [4]. Visiting doctors such as Michael DeBakey, Jao Cid dos Santos and nationals such as Jean Kunlin and René Fontaine came to learn from Leriche [11].

Three years later, on the 10th of March 1927 he was nominated Honorary Fellow of the Royal College of Surgeons of England, having previously released the year before "*Problemes de la physiologie normale et pathologique de l'os*" [4].

A decade later, Leriche was elected professor of medicine at College du France in Paris, thus becoming the successor of renowned physicians and researchers such as Claude Bernard and Charles-Edouard Brown Sequard [4].

Holding now one of the most prestigious academic titles in France, René Leriche continued to work assiduously and in 1938 his volume "*La chirurgie de la douleur*" ("*The Surgery of Pain*") was published [4].

Leriche's international recognition earned him on the 5th of April 1939 the delivery of "*The Lister Memorial Lecture*", given before the Royal College of Surgeons of England as recorded in the British Medical Journal ten days later [12].

During the German occupation of France in the World War II, Leriche continued his work in Portugal for a while [4] then returned to France. Between the 7th of October 1940 and 28th December 1942, Leriche was elected President of the Superior Council of the National Order of Physicians established by the Vichy government. Bruno Halioua in his article "*Does Rene Leriche merit eponymous distinction?*" states that during this period he was responsible for the denunciation of French Jewish physicians [13].

In 1943 René Leriche wrote his monograph on the subject of physiology and pathology of limb arteries [14] followed by the 1947 release of "*Les embolectomies de l'artere pulmonaire et des arteres des membres*" after the favorable report he had given to the French Surgical College at the request of his younger colleague and former pupil Jao Cid dos Santos [15].

After his retirement Leriche began writing his memories and on the 29th of December 1955 at the age of 76 he passed away in the city of Cassis, on the coast of the Mediterranean Sea [4].

Influence

Early in the career of René Leriche, professors like Mathieu Jaboulay and Antonin Poncet became models for the young doctor.

Professor Jaboulay published in 1896 an article on the subject of vascular anastomosis which must have had a great impact on Alexis Carrell and René Leriche. Both of them showed afterwards great interest in vascular physiology and pathology.

Leriche esteemed Jaboulay in such a manner that his tragic death was remembered by the words: "Surgery in Lyon was decimated" [4,16].

After his graduation the young doctor traveled to North America at the suggestion of his former colleague Alexis Carrel. There he visited various clinics where renowned names such as Harvey Cushing in Boston and William Halsted in Baltimore [17].

Although Leriche stayed with Halsted only for three days, it was nevertheless productive. René Leriche would later confess that he was deeply impressed by the way Halsted practiced surgery: rigorous antisepsis and asepsis, anatomical and physiological minded surgical act and perfect hemostasis, principles Halsted had borrowed from Theodor Kocher.

Both surgeons befriended each other and the young Leriche looked from that day on at surgery with different eyes. Despite their age difference, their friendship lasted up until the death of the American surgeon [18].

After completing his training, Leriche stayed in the service of Professor Poncet until the latter passed away [4]. The First World War with its' casualties challenged Leriche as a camp surgeon, offering him diverse learning opportunities and new treatment ideas.

Legacy

As a professor of surgery in Strasbourg, René Leriche had the opportunity to share his knowledge with his pupils and teach his students good surgical foundations together with a compassionate and holistic approach of the patient.

It was in Strasbourg that surgeons such as Jao Cid dos Santos, Michael DeBakey, Jean Kunlin and others came to learn from Professor Leriche [4].

During Michael DeBakey's (1908-2008) training in Europe, before the dawn of the Second World War, he visited Leriche's clinic in Strasbourg. In his paper "*The Clinic of Professor Rene Leriche*", DeBakey describes his experience: "The spirit of camaraderie among his assistants, residents, and interns, the pervading atmosphere of enthusiasm in his clinic, and the worshipful admiration of his patients vividly exemplify the clarifying personality and the admirable characteristics of this great man" [2].

During the lectures, DeBakey noticed Leriche's simple yet comprehensive teaching ability while in the operating theatre he saw the "technical perfection of

the delicate manipulations of this master surgeon” [2]. Nonetheless, the young American surgeon mentions besides Leriche’s interest for various surgical subjects (starting from stomach cancer up to arterial disease and endocrine pathology), his philosophical dissertations during his lectures.

DeBakey closes his paper by stating: “he will always remain in the hearts of those who knew him best, his surgical devotees, as a tolerant teacher and a kind and inspiring master” [2].

Michael DeBakey would later perform with success the resection and replacement of an abdominal aorta aneurysm using a Dacron graft followed by the first carotid endarterectomy, the first successful coronary bypass and in première, the implantation of the left ventricular assistance pump [19].

Jao Cid dos Santos (1907-1975), the son of the famous Reinaldo Cid dos Santos, the founder of angiography, was one of Leriche’s disciples in Strasbourg. After his departure from Strasbourg, both of them remained in good contact, thus in 1947 Dr. Leriche presented on behalf of his younger Portuguese colleague his work on thrombendarterectomy to the French Surgical College. It had been the first successful attempt to permeabilize an obstructed artery without being reoccluded. This was achieved due to heparin [10,15,19].

Dos Santos breakthrough received recognition, therefore establishing a viable method for treating occluded vessels. Heparin proved to be highly beneficial for vascular surgery, especially after the success of dos Santos’ thrombendarterectomy.

One of René Leriche’s national associates and pupil was Jean Kunlin (1904-1991), the father of the autologous vein bypass procedure.

Dr. Kunlin joined Leriche at the First Surgical Clinic of Strasbourg and started working together until Leriche’s retirement. Kunlin respected and esteemed his mentor so much that he followed the he prescribed his treatments, as suggested by Leriche. Atherosclerotic artery disease was treated with lumbar sympathectomy and thrombendarterectomy (arterectomy). On one occasion, Dr. Kunlin was left all by himself to manage a patient with occluded femoral artery and worsening gangrene of the leg, while Leriche had left for vacation.

His mentor’s suggestions prior to his holiday departure to continue the medical treatment were rapidly failing and with no other therapeutic option besides amputation, Dr. Kunlin proceeded with the bypass. He grafted the patient’s saphenous vein, inverted it and made an end-to-side femoro-popliteal anastomosis, bypassing the occlusion. The patient received heparin. Within three weeks of the procedure the gangrene had disappeared [1].

René Leriche was not an advocate for vascular interposition methods, neither a strong opposer, but rather saw it as a risky intervention and doubted that it can ever be achieved.

After his return, Dr. Leriche saw the promising result his associate had achieved and became an advocate for his method, which remained after dos Santos’ thrombendarterectomy a viable treatment option until today [1].

Another French doctor of Leriche during the Strasbourg Era was René Fontaine (1899-1979). Dr. Fontaine was a collaborator of the distinct surgeon and succeeded him as a professor in 1941. Fontaine published in 1954 what is today known as the four stages of peripheral artery disease [20]. Some countries observe this classification as the Leriche-Fontaine classification.

The constellations of symptoms known today as the Leriche syndrome, specific for aorto-iliac occlusive disease were first observed in 1923 [9] and continued to be investigated for the next 17 years [10].

Leriche’s patient was 29 years old when admitted with the onset symptoms that have started two years earlier with intermittent claudication of the proximal lower extremity after walking a few hundred meters accompanied by rest pain during the night. His patient also complained of the inability to maintain erection and complete sexual intercourse. Eighteen years later after the surgery Leriche’s patient was capable of work and reproduction. He had a 14-year-old son [21].

Consequently the Leriche syndrome is established, being defined as claudication of the thigh muscles, hip and buttocks, atrophy of the leg muscles; impotence and diminished femoral pulses [4,21,22].

Due to Leriche’s, dos Santos’, Fontaine’s and Kunlin’s achievements, the peripheral artery disease could be established as a pathological entity, clinically diagnosed, staged and surgically treated.

In recognition of René Leriche’s merits in the field of vascular surgery, the International Society of Surgery created the René Leriche prize.

Leriche as a Thinker

Apart from his exceptional clinical and academical activity, René Leriche was an outstanding orator and thinker. He advocated the necessity of knowing the pathophysiology of disease and treat it accordingly. But his process of thought did not stop only at science but surprisingly contained philosophical dissertations as accounted by his pupils during his surgical lectures [2].

His book “*La philosophie de la chirurgie*” (“*The Philosophy of Surgery*”), covers some of Leriche’s dissertations while in Strasbourg and following his activity as professor at College du Paris.

[23] “*La philosophie de la chirurgie*” proves again the diversity and completeness of Leriche’s activity as a surgeon: from knowledge of the disease to clinical surgical practice, from research to surgical humanism expressed through respectful, compassionate and professional approach of the patient.



Figure 1. Photograph taken during Michael DeBakey's visit at the clinic of Dr. Leriche in Strasbourg between 1935-1936. René Leriche is in the front row, second from the right, while at his left, in the middle of the front row is Michael DeBakey. Digital image. The National Library of Medicine Profiles in Science. The National Library of Medicine Profiles in Science, n.d. Web. <<http://profiles.nlm.nih.gov/ps/retrieve/ResourceMetadata/FJBBCP>>.

Conclusions

René Leriche pioneered surgery with his research and ideas. Nevertheless his assiduous work of teaching, research and clinical practice activity made him a model for the future generations of surgeons. His influence has lasted to our present. Last but not least, René Leriche was beside a skillful surgeon also a critical thinker and a compassionate physician, qualities which had earned him a place in the history of medicine.

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