

# JOÃO CID DOS SANTOS SEEN BY HIS DISCIPLES AND COLLEAGUES

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## INTRODUCTION

I was asked by the Editor of the Portuguese Journal of Cardiac Thoracic and Vascular Surgery to write an article evocative of the personality of João Cid dos Santos, who was a leading figure of the Portuguese Medicine and Culture, a distinguished Professor of our Faculty of Medicine and one of the "Founding Fathers" of modern Vascular Surgery (Figure 1).

Not having met him, I carried on some research on the perspective of the opinions expressed about Cid dos Santos regarding the biographical aspects, the personality and the impact of his work in the history of contemporary surgery.

The sources used in the paper consisted in articles and testimonies written in memoriam after his death, several biographical publications, and the scientific work he left with his collaborators. Additionally, letters, paperwork and scientific material from the historic collection of the Vascular Surgery Department of "Hospital de Santa Maria" (HSM) were included.

A general limitation can be recognized as mainly evocative and homage texts were used and therefore only were praised the positive aspects.

## SHORT BIOGRAPHY

João Cid dos Santos was born in Lisbon on August 5, 1907. He finished his medical degree at the Lisbon Faculty of Medicine in 1933, during which he worked as Anatomy Trainer ("Preparador de Anatomia").

In 1936, after being admitted to surgery internship, he completed a 1-year fellowship in Strasbourg in the department of René Leriche, where other future surgical leaders like DeBakey, Malan, Kunlin and Arnulf were also training. This period was crucial for his personal and scientific

development. That is clear from his own words quoted by A. Dinis da Gama: "... Therefore, our fellowship with Leriche marks a capital moment of our life. The clash within us between the personalities and respective orientations of our two Masters was the determining factor in the formation of the mentality that- good or bad- we still retain today..."<sup>1</sup>. It is also interesting to read Edmondo Malan's perspective of this period, confirming the friendship that united these men in the following decades when they became leaders of surgery in their countries<sup>2</sup>.

In 1937, he continued the internship at the surgery department of Hospital de Arroios ("Hospitais Civis de Lisboa"-HCL) run by his father and where he met other relevant personalities, such as Aníbal de Castro in Medicine, Roberto Chaves in the analysis laboratory and Pereira Caldas in radiology.

In 1942, he assumed the position of surgeon at the HCL working at the "Hospital de Santa Marta", and during the last years of the 2<sup>nd</sup> World War he was Chief Navy Surgeon in the island of Faial.

He received his PhD in 1944 with the thesis "General Pathology of Ischemia". In 1945, he became Extraordinary Professor of Surgery, and Full Professor in 1949.

After the inauguration of the "Hospital Escolar de Santa Maria" (HSM) in 1953, he left "Hospital de Santa Marta" and took over the position of Head of the new service of "Clínica Cirúrgica" where the basic lines of research continued in a brand-new department.

He always had strong international contacts, he promoted his work intensively and obtained prominent positions in institutions such as the "Sociedade de Ciências Médicas" in Lisbon, the European Society of Cardiovascular Surgery (founding member), the International Society for Cardiovascular Surgery, the Hunterian Society, the Royal College of Surgeons of England as well as the Royal College of

Surgeons of Edinburgh. He was also distinguished as Doctor Honoris Causa by several Universities.

Finally, it is worth mentioning a short and unsuccessful political experience as an independent member of the Parliament from 1953-57<sup>3</sup>.

Being a heavy smoker, he died of complications from ischemic heart disease on November 4, 1975, at the age of 68.

## THE MAN

The main attributes of Cid dos Santos according to one of his beloved disciples, Fernando Oliveira Pinto, were his intelligence, work capacity, broad vision of problems, constant thinking and insatiable curiosity<sup>4</sup>.

Physically, he was described by Henrique Bicha Castelo as a man with "an angular face, bushy eyebrows and large, almost rough hands"<sup>5</sup> with a presence that stood out in contrast to the friendly and affable personality recognized in many of the testimonies. José Fernandes e Fernandes confirms this view by describing a "slender and tall figure, the unmistakable profile, that the bushy eyebrows, the penetrating and shrewd look, marked the sympathy and affability to the younger"<sup>6</sup>.

He was polyglot, conversationalist, sociable and a life lover, as can be seen from almost all texts consulted<sup>7</sup>. After operating on at a hospital in downtown Lisbon, it is said that he went to a well-known restaurant where he himself

cooked a dish of scrambled eggs known as "ovos à professor" (professor style eggs) that was still available until recently. He was also a music lover and a piano player.

Cid dos Santos was recognized as a cultured man and a man of culture, had he not been the son of his father Reynaldo dos Santos. Indeed, he grew up in an environment of broad spirit and ideas and met the cream of Lisbon's culture at the time through family connections<sup>8</sup>. He wrote about his Father words that could perfectly be applied to him, according to Fernando Oliveira Pinto<sup>9</sup> and João Salvador Marques<sup>10</sup>: "Quality is the fruit of one's own personality, allied to one's education, one's culture, to the strength of one's thought, to the people and to the environment in which it has developed. It is the association of nature with the formation of the mind"<sup>11</sup>.

The influence of the family environment in the sense of contact with cultural diversity was also highlighted by Eduardo Girão do Amaral when he wrote that the "possibility of living in an environment where everything was science and art, provided him, still very young, to enjoy a rare era of intellectuality resulting from the spiritual union of an exceptional group of men whose personalities dominated the respective field of action..."<sup>12</sup>.

João Cid dos Santos was a charismatic man. His influence on those around him, namely his disciples and students, was remarkable and everyone remembers him as someone who was able to influence their thoughts and actions, not because of any kind of obligation other than obvious hierarchy, but because they admired him and believed in him. According to Jorge Draper Mineiro, he was "a trainer of men and his personality had the merit of not erasing or destroying the young people who grew up beside him and he adored them, but rather of cherishing, stimulating and helping to create"<sup>13</sup>. Beyond his natural charisma, he can be seen as an Influencer according to the current communication standards.

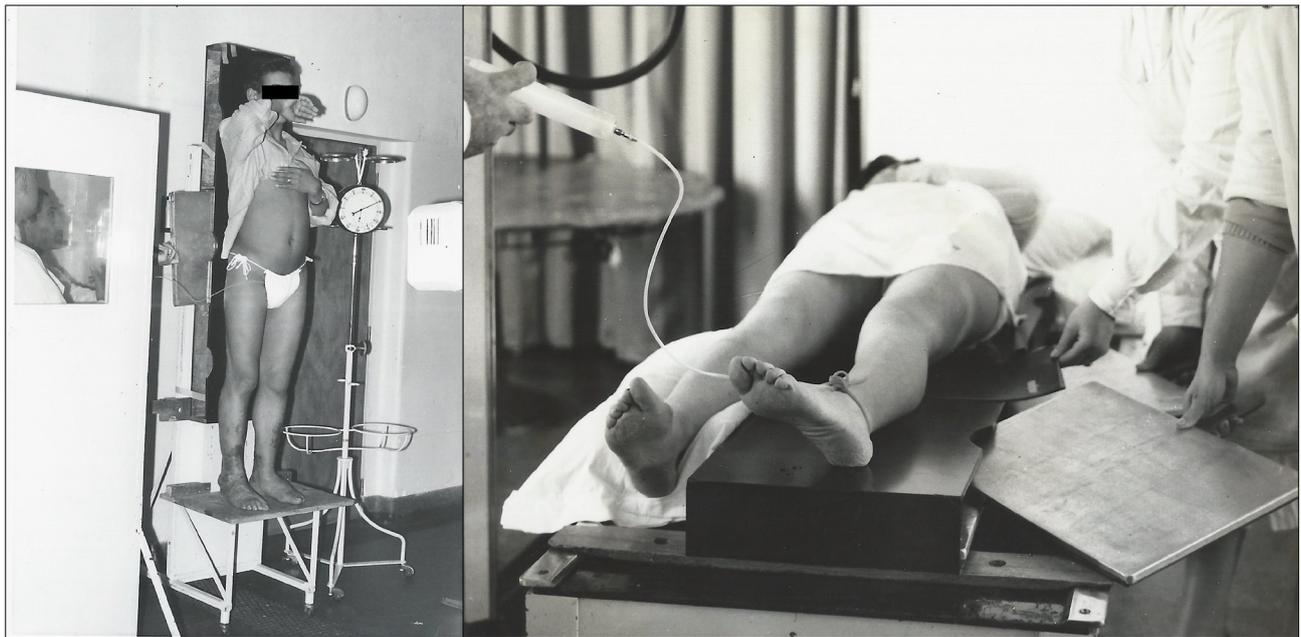
Another feature about João Cid dos Santos and expressed in multiple hospital correspondence, is his independence and ethical behavior. Fernandes e Fernandes mentioned that "his spirit of independence was not compatible with the culture of subservience at the time"<sup>6</sup> and this brought him some difficulties and annoyances. One example is the struggle, sometimes fierce, that has been waged since 1973 for the creation of a vascular surgery department at HSM. Letters from that time mention the rationale for such a decision<sup>14</sup>. However, the creation of the department only took place in 1986, 11 years after his death, 13 years after the initial correspondence on the subject<sup>14,15</sup> and 14 years after the creation of the vascular surgery department at Hospital de Santo António in Porto, the first in Portugal.

One of the most touching and elevated testimonies about Cid dos Santos was written after his death by his doctor (who was also his father's doctor) and fellow internist Armando Ducla Soares. He characterizes him as "the personality of science in an extremely human soul with multiple facets in which particular aspects of the Artist are concentrated" and describes what he calls the "Art-Science Circuit" in which "along with the lively curiosity that led him to define himself



**Figure 1**

*Classic picture of the two "Founding Fathers" of modern Vascular Surgery - Michael DeBakey and João Cid dos Santos - in a relaxed chat*


**Figure 2**

*Vertical and horizontal phlebographic techniques proposed by Cid dos Santos and his collaborators.*

as a researcher, the aesthetic concern that gave forms of rare harmony to the exteriorization of his work"<sup>16</sup>. Ducla Soares knew him well and describes his clinical and scientific work as pragmatic and instinctive "without immediate concern with the multidisciplinary analysis of the subject in question"<sup>16</sup>. He also mentions that "first accepting his own intuition he can escape the danger that the exaggerated systematic criticism represents. It was only in this way that in his works on arterial surgery he was able to overcome the dogma of the irreplaceable function of the vascular endothelium (...) "<sup>16</sup> and continues "from a scientific point of view, Cid dos Santos seems to us like a knight of adventure (...) with pragmatic vision of his interests (...) "<sup>16</sup>.

Another very interesting aspect is the relationship with his father and the way he lived with a dominant figure in the same profession and work environment. He addressed this subject at the opening lesson of his first course<sup>17</sup>, explaining with humor "...if I didn't answer the questions and revealed my ignorance, it was natural- it was me. But if I read a good observation from a patient (...) it was also natural- it was him". Juvenal Esteves mentions that he "submitted to all the exams of his medical career, seeking clear professional and personal independence in order to become autonomous from his father". However, "interadmiration and respect were constant"<sup>18</sup>.

The psychiatrist, also a Full Professor of the FML, Henrique Barahona Fernandes, in a posthumous homage, addressed this topic saying that "father and son succeeded in an exemplary way. We know of no more perfect way of resolving the conflict of personal identity (...). Without idealizing perfections, there was undoubtedly conflicts between two so marked individualities and both so much

identical (...) and so much dissimilar" and further on "all these genetic and psychogenetic determinants managed to be crowned and surpassed by the self-realization characteristics of João compared to the model Reynaldo"<sup>19</sup>.

João Cid dos Santos cultivated relationships with international colleagues in medicine and surgery, who were very important in his life. In the tribute book written after his death, the friendship and esteem held by personalities such as René Fontaine, George Arnulf, Reginald Murley, Edmondo Malan, Allan Callow, Patrick Fitzgerald, Sebastian García Diaz, Jesse Teixeira, Mário Degni, John Kinmonth or J. Van Der Stricht are well expressed<sup>7</sup>. The testimony of Edmondo Malan<sup>2</sup> is particularly warm, describing aspects of the intimacy of the home in "Largo da Rosa" and the description made by Reginald Murley about a visit to Portugal ("most memorable pilgrimage") of a Hunterian Society delegation is also very interesting. Here, the personal and professional consideration they had for him are clear as well as the hospitality provided by Cid dos Santos<sup>20</sup>.

## THE ACADEMIC

Fernando Oliveira Pinto describes the atmosphere in Cid dos Santos' first class after becoming "Extraordinary Professor", in October 1945, which took place in the "small amphitheater of the old Hospital de Santa Marta" and with the presence of his assistants. His gift of speech, the clarity of exposition, his culture, sympathy and pleasure in teaching were outstanding<sup>21</sup>. In fact, his teaching qualities were praised by several authors who called him a "great educator"<sup>21</sup> and "a pedagogue"<sup>22</sup>.

Maria Antonieta Baião, at the unveiling ceremony of the commemorative plaque at FMUL's Amphitheater Cid dos Santos, characterized his classes as "a book where we received, in addition to his teachings, a favorable influence and a desire not to stay away anymore from his life and knowledge; along with this, there was an unparalleled camaraderie"<sup>22</sup>.

Again, the attributes of an Influencer.

João Cid dos Santos left a School which was essentially a scientific School. A School in the sense of a group of disciples who continue and develop their master's ideas, and which should, in my opinion, be understood as following ideas or acting because one believes in them and not because of some kind of hierarchical obligations. It seems clear that it was the case of Cid dos Santos, who linked himself to his collaborators in relationships of friendship, trust and belief in his ideas that originated a homogeneous group and led to the continuation of some lines of research after his death, mainly in the phlebographic area. In all the writings of his collaborators they consider him their role model what is, again, a manifestation of his charisma.

He said one day, expressing this spirit of School: "I don't forget my friends and my collaborators. You can't live without them" (J. Cid dos Santos on the obverse of a medal evocative of endarterectomy by Mestre Joaquim Correia).

It is curious to note that he even divided his disciples according to generation into "Sons" and "Grandsons". Interestingly, in the generation of the "Sons" António Coito, Girão do Amaral, Jorge Mineiro, Cândido da Silva, and Teixeira Diniz<sup>15</sup>, one of the youngest, were Full Professors and Heads of Department but with limited international visibility. However, the "Grandsons" A. Dinis da Gama and J.

Fernandes e Fernandes were those who had greater national and international projection because, in addition to being Full Professors and Heads of Vascular Surgery Department in the HSM, they led international societies and developed their own lines of investigation. They also got training in modern arterial surgery in foreigner renowned centers bringing this knowledge to Portugal where they were, undoubtedly, main drivers of modern vascular surgery. Henrique Bicha Castelo, from the second generation as well, also became a Full Professor and Head of the general surgery department "Clínica Cirúrgica" at HSM.

Cid dos Santos' academic activity included writings that expressed serious concerns about the medical education and the university in general, as well as the organization of the hospital: the "collective problems", as Juvenal Esteves mentioned<sup>18</sup>.

He always defended constructive criticism, namely with the supervisory bodies, and a report on the situation in hospitals earned him a three-month suspension in 1966<sup>21</sup>.

### THE WORK AND SCIENTIFIC ACHIEVEMENTS

Cid dos Santos' scientific activity took place over a long period of time since it began when he was still a student.

There were several topics researched, from anesthesia and digestive surgery to urology and gynecology, which were pathologies treated at the time by general surgeons<sup>10</sup>. However, it was his research into vascular surgery and angiography that made him so remarkable, and on which we will focus even though they have been extensively studied in the literature.



**Figure 3**

*A - Angiogram from 1935 to visualize an experimental venous bypass procedure in a dog that, according to Cid dos Santos, may be the first angiogram of a functioning graft<sup>20</sup>.  
B - Intra-operative control angiogram by puncture of the SFA dated from 1947.*



**Figure 4**

Classic picture of the operative theatre with Cid dos Santos surrounded by a huge number of observers during the II Congress of the International Society of Angiology in 1953.

## 1. Angiography

It is worth mentioning the following innovations made by Cid dos Santos in improving the technique and safety of Reynaldo's aortography. These improvements were described, among others, by António Coito: initial test with a small dose of contrast for avoiding inadvertent injection into collaterals; new needle type with side holes and end lock; global study of the aortic/abdominal and lower limbs circulation with the same injection and therefore creating the aorto-arteriography with successive angiograms in a special angiographic table<sup>23</sup>.

However, it was in phlebography that he played a truly innovative role after his father had given him the responsibility of developing the application of angiography to the venous system, which was more difficult due to its anatomical and physiological characteristics. The first phlebography was performed on August 8, 1933, but its publication appears only in 1937<sup>24</sup>. Cid dos Santos prophetically mentions that "the results obtained allow us to assume that its application to the various physiological and pathological conditions of the venous circulation will yield important conclusions"<sup>24</sup>. In fact, phlebography was essentially a morphological method that went further and provided functional information through the different phlebographic techniques that Cid dos Santos and his collaborators created for the individual study of each

pathology over a period of almost 40 years<sup>25</sup> (Figure 2).

Phlebographic techniques became known due to the international contacts of Cid dos Santos and his collaborators, through multiple presentations and scientific publications. Their clinical importance declined with the development of non-invasive techniques, but the importance of phlebography as a method of anatomical and physiological understanding of the venous system cannot be questioned.

The angiographic experience of the "Centro de Angiologia Reynaldo dos Santos" always took place in the premises of the department of "Clínica Cirúrgica", with Cid dos Santos fighting to prevent the centralization of this activity in the Radiology department when the HSM began functioning. In fact, he recognized that "a separate department of angiography is just inadmissible although this is the case in many places in the world. A vascular service without its own angiographic unit is like a body without a limb. Angiograms are the eyes of the vascular surgeon; without them, he at once becomes a mole"<sup>26</sup>.

## 2. Endarterectomy

The introduction of endarterectomy was João Cid dos Santos' innovation that lasted through time and put him in the history of arterial surgery. His technique is still performed in a

daily basis in vascular surgery departments worldwide, mainly in the carotid and common femoral territories.

The history of the discovery of endarterectomy is very interesting and has been described in several texts<sup>1,4,6,26,27,28</sup>. However, we should recognize that it resulted from a previous activity in experimental arterial surgery in animals as well as from the treatment of patients with arterial pathology according to the techniques available at the time. Cid dos Santos performed Carrel's techniques on the dog with perioperative angiographic demonstration in the 1930's (Figure 3-a) and in the 1940s he had already carried out Matas' endoaneurysmography and embolectomies under heparin according to the principles of Carrel and Einer Key (1923). He even introduced the term thrombo-embolectomy in 1944 for the removal of prolonged thrombi. He performed perioperative angiographic demonstrations, providing images that were original in the 1940s and are still very actual (Figure 3-b).

Therefore, he performed a significant arterial surgical activity before the advent of endarterectomy!

Fernando Oliveira Pinto and others<sup>1,4,27,28</sup> described the first two endarterectomy cases: "In June 1946, in the UA-UB operating room at Hospital de Santa Marta, an old thrombus was removed using improvised instruments in a totally occluded femoral artery. The anatomopathological examination exam showed that, in addition to the thrombus, the endartery (intima) and part of the media had been removed. The artery had remained patent under heparin with only part of the media and tunica externa. Six months later, an identical operation on a subclavian-axillary region was performed. The artery continued patent when heparin was suspended 15 days later and at late follow-up<sup>14</sup>. Later, heparin proved to be unnecessary, and the "Intima Myth" fell<sup>29</sup> questioning one of Virchow's laws. The technique was presented at the "Academie Française de Chirurgie" by suggestion of Leriche, was diffused and performed by several surgeons. Later, improvements were introduced, such as the so-called Kunlin stitches, over-pass endarterectomy and patch closure, and designated instruments such as the Wolmar rings were produced<sup>29</sup>. In 1976, at the congress of the International Society of Cardiovascular Surgery in Rome, Cid dos Santos made a summary of the state of the art of endarterectomy known as the "Principles of Rome"<sup>30</sup> (Figure 4).

A limitation of this initial experience was pointed out by Fernandes e Fernandes<sup>6</sup> when referring to the lack of series of cases supporting the global results of the technique what can probably be explained by the fact that this methodology was not yet common in the French-speaking scientific world in the mid-twentieth century. However, the late results of Cid dos Santos's arterial experience were considered in a very interesting publication where his concepts and principles were discussed based on cases documented by arteriography<sup>29</sup>.

The discovery of endarterectomy celebrated its 75<sup>th</sup> anniversary in 2021, which was commemorated by the "Sociedade Portuguesa de Angiologia e Cirurgia Vascular-

SPACV" and the "Faculdade de Medicina da Universidade de Lisboa- FMUL" in a ceremony evocative of João Cid dos Santos and his technique.

## EPILOGUE

Lastly, there is nothing better than transcribing the farewell words to his collaborators: "Nothing more can be expected from me. I managed to accomplish almost everything I wanted. I regret not publishing the books on Endarterectomy and Phlebography and I also feel sorry for leaving you. However, my mission is over. Continue the work, defend the Department and the Centre" ("Centro de Angiologia Reynaldo dos Santos")<sup>31</sup>.

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