

Remembering a Part of the History of a University Hospital in Service to the Community: 'The Cardiology Service of Hospital Italiano de Buenos Aires in the Development of Hemodynamics in Argentina'

Alberto Tamashiro

Servicio de Hemodinamia. Hospital Italiano Buenos Aires. Buenos Aires, Argentina

ABSTRACT

At the beginning of the 1960s, under the direction of the Cardiology Department of the Italian Hospital, hemodynamic studies began using a modest X-ray machine with a fluoroscopic screen. Between 1964 and 1965, it installed an angiograph—the first in Argentina equipped with an image intensifier, a TV camera, and 35 mm cine film. Over time, hemodynamics gradually developed its own identity, eventually becoming an independent hospital department.

With the new equipment, the first coronary angiographies in the country were performed, along with lower limb arteriographies and other non-cardiological studies using cine film instead of radiographic plates, allowing for dynamic visualization. It also enabled catheters to be guided to tumor-bearing organs for selective intra-arterial chemotherapy. Thus, hemodynamics gained recognition in the country and might have been crowned by the potential addition of Dr. René Favalaro to the hospital—an opportunity that, despite his interest, did not materialize.

Keywords: Hemodynamics, Hospital Italiano, history, catheterization, angiography.

Recordando una parte de la historia de un Hospital Universitario al Servicio de la Comunidad: "La Cardiología del Hospital Italiano de Buenos Aires en el desarrollo de la Hemodinamia en la Argentina"

RESUMEN

A principios de los años sesenta, bajo la dirección del Servicio de Cardiología del Hospital Italiano, se comenzaron hacer estudios hemodinámicos con un modesto equipo de rayos X con pantalla fluoroscópica. Entre los años 1964-65 se instaló un angiógrafo, el primero en la Argentina con intensificador de imágenes, cámara de TV y cine de 35 mm. Con el tiempo, la hemodinamia fue adquiriendo su propia identidad convirtiéndose de hecho en un Servicio Hospitalario autónomo. Con el nuevo equipo comenzaron a hacerse las primeras coronariografías del país, las arteriografías de miembros inferiores y otros estudios no cardiológicos con cine en lugar de placas radiográficas, lo cual permitió obtener una visión dinámica. También posibilitó guiar los catéteres hasta los órganos con tumores para hacer quimioterapias selectivas intraarteriales. De este modo, la hemodinamia fue cobrando prestigio en el país y se hubiera completado con la posibilidad del ingreso del Dr. René Favalaro al Hospital y que se frustró a pesar sus deseos.

Palabras clave: hemodinamia, Hospital Italiano, historia, cateterismo, angiografía.

Author for correspondence: alberto.tamashiro@hospitalitaliano.org.ar, Tamashiro A.

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INTRODUCTION

The Hospital Italiano de Buenos Aires has experienced steady growth since its inception, becoming today one of the most prestigious institutions in patient care, scientific development, and teaching. The advancement of Cardiology, along with Hemodynamics, played a key role in this growth, and as a result, its reputation expanded nationwide.

This article aims to highlight the names that deserve remembrance –those who were the protagonists of an epic history due to their work with the equipment available at the time and the collaboration they achieved with other hospital departments. It also seeks to mention distinguished cardiologists of that era, as well as noteworthy events and anecdotes at both the national and international levels that accompanied the development of Hemodynamics.

METHOD

Many of the events mentioned are contributions kindly provided by Drs. Carlos A. Garlando and Edgardo Marecos, who witnessed these events. Finally, a large number of the historical events recalled have been cross-checked with publicly available information.

DEVELOPMENT

The Hospital Hemodynamics Department developed alongside Cardiology and Cardiovascular Surgery in the 1960s. At that time, it received patients from various parts of the province of Buenos Aires for surgical consultations and cardioversions.

The Cardiovascular Surgery Department comprised the head, Dr. Fidel Donato; the deputy head, Dr. Amadeo Pisanú; and Drs. Helio Ferrari, César Brea, and Enrico Bertolozzi. Dr. Ricardo Pichel was in charge of extracorporeal circulation starting in 1964. He was an avid reader, always carrying a book; he read about physics, chemistry, epistemology, philosophy, and even the Bible. Years later, he became the first Rector of Favaloro University.¹ The Cardiovascular Surgery Department was primarily dedicated to valve replacements, peripheral vascular diseases, congenital heart defects, and pacemaker implantation. A double valve replacement was a notable event, garnering attention to the extent that he made the newspapers. But it was eventually overshadowed by Dr. Cristian Barnard's first heart transplantation in South Africa 1.

Dr. Francisco Romano was chief of the Cardiology Service, which included an annex known as the Hemodynamics Clinic., attended by Drs. Juan A. Caprile and Raúl Oliveri, who evaluated preoperative and postoperative patients. Dr. Caprile was the head of Hemodynamics and came from Ricardo Gutiérrez Children's Hospital.

Due to his experience in vascular access, Dr. Carlos A. Garlando, who was then a resident in cardiovascular surgery, was invited to join the Hemodynamics team. From that moment on, his medical career became definitively oriented toward Hemodynamics.

Using an old X-ray machine in the Cardiovascular Surgery sector, hemodynamic studies were performed with a fluoroscopic screen. It had suspended ball transformers from which, due to humidity, sparks would jump– it looked like a scene from a Frankenstein movie, as those present would say. There was no awareness of radiation protection, and the operators exposed themselves to direct radiation. Years later, Dr. Garlando developed leukopenia with a white blood cell count of 3,000, requiring him to take a temporary break from his work. Patients referred for catheterization had congenital heart diseases and valvular disorders. Their evaluation included electrocardiogram recordings and pressure measurements from different heart chambers, with the data captured on continuous paper strips using a two-channel device. The images were viewed directly on the fluoroscopic screen, with low resolution and no possibility of recording them.

Between 1964 and 1965, the hemodynamics unit was moved to a Radiology sector, now partially occupied by the Pharmacy Unit. Thanks to the efforts of Drs. Caprile and Oliveri, a Siemens radiology system –unique at the time in Argentina– was installed there. It had a Gigantus® model generator of 1000 mA and 150 kV, a Sirecon Duplex® image intensifier of 6 and 9 inches, and a TV camera.

For image acquisition, the setup included a 35 mm Arriflex® cine camera with continuous filming at 48 frames per second, an Odelca® camera for congenital heart disease studies that captured images on 70 mm film at a rate of 6 frames per second, a Seriograph for digestive studies, and a retractable chassis under the table for abdominal aortograms and lower limb arteriography with plates. Shortly afterward, these studies started to use cine equipment. The procedures were performed with angiographic catheters featuring a blind tip and lateral holes, known as Rodríguez Álvarez catheters, which were inserted through dissection of the humeral artery at the level of the elbow crease.

With the image intensifier and TV camera, they were able to view fluoroscopic images in real time with good definition. Additionally, they could guide catheter advancement and control the injection of contrast material during filming. That marked the beginning of a new era in radiological imaging.

The most common studies were aortograms and lower limb arteriographies. The opacified arteries were dynamically filmed with contrast material from the aorta to the foot, eliminating the need for the traditional spot-film technique.

Catheterization procedures were a novelty at the time and replaced the direct puncture technique.

Gradually, requests for studies for other territories followed, such as renal angiographies with advice from Jorge Sciappapietra, the urologist and nephrologist of the Hospital; studies of neck vessels guided by Dr. Enrico Bertolozzi, cardiovascular surgeon, and cerebral arteriographies with the collaboration of the neurosurgeons of the Hospital, Dr. Tramontano and Dr.

Raul Matera. Our friend and later head of the Neurology Service, Dr. Lucio Serra, taught us how to interpret and report on cerebral arteriographies. The neck vessel studies and cerebral arteriography by catheterization solved the limitations of the puncture studies; with only one procedure, it was possible to perform arteriography of the four neck and cerebral vessels in the different radiological positions, without general anesthesia and also by avoiding patient discomfort and complications at the puncture site.

They presented their experiences regarding renal arteriography at the 5th Rioplatense Urology Conference held in Montevideo in 1969 and the 2nd Medical Clinic Conference in Buenos Aires in 1970. In the scientific meetings held by the Hemodynamics Service of the Sanatorio Güemes in June 1971, the topics "Aortograms and arteriography of lower limbs," "Renal Arteriography," and "Selective arteriography of the four neck vessels" were presented. In May of the same year, they reported the first case of vena cava filter placement with the Mobin Uddin® device for preventing pulmonary thromboembolism at the Argentine Society of Surgeons of the AMA. Dr. Garlando presented the titles mentioned.

Treatment of neoplasms by intra-arterial drug infusion expanded the scope of hemodynamic possibilities. Real-time radio-copying allowed for guiding the catheters to the tumor vessels and selectively injecting antitumor drugs and/or embolizing substances.

Dr. Garlando presented his results in presentations and publications:

- Research on intra-arterial continuous infusion chemotherapy in advanced cancer: First Latin American Congress of Antineoplastic Chemotherapy, Buenos Aires, 1966.

- Intra-arterial chemotherapy by continuous infusion in advanced neoplasms.

- The intra-arterial route, chemotherapy of tumors in various locations².

- Radiological imaging research in renal tumors: 1st Latin American Congress of Cancerology. Asuncion, 1969.

- Selective renal arteriography. Its diagnostic value in renal tumors: 5th Rioplatense Conference on Urology. Montevideo, 1969, and 2nd Conference of Medical Clinic in Buenos Aires, 1970.

The demand for extracardiac angiographic studies by cine catheterization became more and more frequent and gradually extended with the installation of new cine equipment in the different centers of the country.

Hemodynamicists were practically the only ones available to perform catheterization procedures. Necessity then made them begin to routinely perform extracardiac angiographies. At present, hemodynamicists are members of the Argentine College of Interventional Cardioangiologists (CACI). In those years, instruments were available, but few radiologists performed angiographies. The most relevant were Dr. Gloria Díaz and Dr. Julio C. Salvidea of the Angiography Section of the Radiology Service of the Rawson Hospital.

Doctors Carlos Garlando and Carlos Fiore co-started to perform valvular studies through right and left catheterism through the brachial route with the catheters known at that time, Rodríguez Álvarez and Cournand, and transient pacemaker catheters; complete with pressure and electrocardiogram recordings with a multichannel Samborn® equipment in charge of Dr. Gianni Corrado, who later developed the Electrocardiography and Electrophysiology Section of the Hospital Italiano. With the same Samborn equipment, Dr. Pedro Cossio (h) and Dr. Eduardo Ferreirós could also perform phonomecanographies.

At that time, Dr. Alfredo González Martín from the province of Mendoza was linked to the cardiovascular surgeons and originated the relationship with the team of cardiologists. At the end of 1966, Dr. Juan A. Caprile, a pediatric cardiologist, invited Dr. González Martín to participate in a course on "Cardiac Catheterization and Hemodynamics"; at that time, he was one of the first to talk about femoral access. From that moment on, a relationship with the Hemodynamics Section of the Hospital Italiano began. On his part, Dr. Gonzalez Martin invited Dr. Garlando to perform a renal angioplasty in Mendoza City. Thus began the dissemination of the methodology.

The history of the beginnings of coronary angiography at the Hospital Italiano deserves some comments because it developed in a national and international atmosphere with interesting facts and anecdotes. Dr. F. Mason Sones accidentally performed the first coronary angiography at the Cleveland Clinic in 1958. To demonstrate the efficacy and safety of the method, in 1962, he presented the experience of 1020 coronary angiographies performed during four years. Thus, Dr. René Favaloro, an Argentine cardiac surgeon at the Cleveland Clinic, developed the coronary bypass technique, which was performed for the first time in 1967 and radically changed the treatment of ischemic heart disease.

Coronary angiography was not fully accepted in its early days. To counteract the criticism, Dr. Sones had a coronary angiography done himself and sowed it when he was invited to a conference at the Italian Hospital (it was good). In 1966, Dr. Enrique Fierenz, an Argentinean who had trained at the Cleveland Clinic, arrived at the Hospital and made the first coronary angiography studies in the country with 35 mm films, four years after Dr. Sones' first publication. The doctors at the Hospital incredulously asked Dr. Marecos, a Cardiology resident, "What was coronary angiography like?"

In 1966, under the direction of Dr. Raúl Oliveri, the Coronary Unit was opened, the second in the country (Dr. Carlos A. Bertolasi opened the first one in 1965 at the Argerich Hospital in the city of Buenos Aires), which became a source of referral of patients for hemodynamics. Research was quickly developed on the pathophysiology of pump failure in myocardial infarction at the bedside, which earned the Prize of the Argentine Society of Cardiology.

With the contributions of the Coronary Unit of the Hospital and the coronary studies, the seminars began, initially on Thursdays and then moved to Tuesdays at 9 pm in the Orthopedics room. Cases from the Hospital and other centers were presented. There was a large attendance despite the schedule; It was usual to see the presence of prominent doctors such as Drs. Luis de la Fuente, Mauricio Rosembaum, Marcelo Lazzari, Julio Elizari, Carlos Bertolasi, Ricardo Esper, J. D'Oliveira (from the Military Hospital), Pedro Cossio, Amuchástegui (from the province of Córdoba), Bernardo Boskis, Luis Becú (an internationally renowned pathologist at the Children's Hospital) and Enrique Almonacid, president of the Argentine College of Angiology and director of the biannual course in the specialty.

35 mm films could only be evaluated with a 16 mm projector, so they had to be reduced to that format and projected with special equipment. Sometime later, they acquired the 35 mm Tagarno® projector, the only one existing in the country. It is a device that allows a film to be projected at different speeds with frame stopping and frame-by-frame forward and backward.

It was a high-quality projector to the point that Dr. de la Fuente, who had praised the benefit of the projector, and other doctors attended the conferences to project their films. Dr. Carlos Salgado, director of the Fernández Hospital at the time, also came to the Service to see the studies carried out in his hospital. Years later, Dr. Salgado was secretary of the Board of Directors of the College of Hemodynamics.

Coronary angiography was the main topic in the presentations at the congresses. Dr. Fierenz organized presentations and courses at the 7th Congress of Cardiology (1967) held in the Aula Magna of the Faculty of Medicine, where he presented: "Selective cine coronary arteriography". Dr. Fiore contributed a "Cineangiocardiology in mitral insufficiency" and Dr. Garlando, "Cineangiocardiology in aortic insufficiency."

In late 1967, Dr. Fierenz returned to the United States for family reasons, and in early 1968, he was replaced by Dr. Enrique Efraín Leguizamón, an Argentinean who had also trained at the Cleveland Clinic but remained at the Hospital for only a short time. Nevertheless, they gathered enough material to present and win the "Dr. Luis Sivori" Cardiology Award from the Faculty of Medicine of the University of Buenos Aires in 1970.

Doctors Garlando and Fiore were in charge of performing the coronary studies with the experience acquired with doctors Fierenz and Leguizamón.

Dr. René Favaloro had assessed the conditions of the Hospital for his activities. He came to the country for the first time at the end of 1964 with his wife; Dr. Garlando, at the request of Dr. Donato, head of Surgery, waited for them at the Ezeiza airport every time they came. He stayed ten days in Argentina and, during that time, performed several Vineberg operations (the operation consisted of the autotransplant of the left internal mammary artery, introducing the open end of this artery into a tunnel made in the thickness of the wall

of the left ventricle to create collaterals that connect with the coronary tree. It is a technique performed before coronary bypass).

It was his wish to return to Argentina, which is why there were conversations with the surgeons Dr. Donato and Dr. Pisanú. He returned the following year. He stated that he wanted to operate at the Italian Hospital because of his Italian blood (he was of Sicilian descent). He also had discussions with Dr. Juan B. Borla, director of the Hospital. In 1967, Dr. Favaloro was already a staff physician at the Cleveland Clinic and had performed the first coronary bypass. On each of his returns, he made presentations showing the results of this method applied at the Cleveland Clinic. On his third trip, he came with the recommendation of Dr. José María Mainetti and Dr. Alfonso R. Albanese, leading surgeons in Argentina. As the Hospital had a history of two Services of the same specialty, they proposed to create two Cardiovascular Surgery Services, each with its corresponding head. However, there was no agreement reached. However, Dr. Favaloro continued visiting the Hospital to operate on a few cases.

Among other anecdotes, Dr. Garlando mentioned that every time Dr. Favaloro and his wife arrived in the country, upon arriving at the Cardiovascular Surgery Department, he was seated at the reception desk waiting to be attended by the chiefs. The surgeon, widely renowned worldwide, had the humility to wait seated until assisted!! Finally, Dr. Favaloro returned definitively to Argentina to begin his activities in 1971 at the Sanatorio Güemes, leaving the United States at the height of his career. In 1969, Favaloro and the Cleveland Clinic group presented at the Congress of the Society of Thoracic Surgeons the results of the significant number of 570 patients operated on less than two years after the first bypass. Thus, a great opportunity was thwarted to develop the most outstanding international cardiovascular center at Hospital Italiano.

Nevertheless, the evolution of Hemodynamics continued. In January 1972, Dr. Guillermo Pujadas took over the Hemodynamics Service. But this was the beginning of a new stage that deserves consideration at another time.

It is worth remembering some events and personalities related to the development of Hemodynamics in our institution:

- In the early 1960s, Hemodynamics began conducting studies under precarious conditions using an old X-ray machine. This development was a joint effort with the Cardiology and Cardiovascular Surgery Services.

- 1958: Dr. Mason Sones performed the first coronary angiography accidentally.

- 1962: Dr. Mason Sones published his experience with 1,020 coronary angiographies.

- 1964: Dr. Ricardo Pichel was responsible for extracorporeal circulation at Hospital Italiano. He later became the first Rector of Favaloro University.

- 1964-65: A unique Siemens® radiology system was installed in Argentina, featuring an image intensifier, a TV camera, and a 35 mm cine camera.

- 1964: Dr. René Favalaro came to Argentina for the first time from the United States to work at our institution. Sometime later, he returned several times with the same intention.

- 1965: With the incorporation of a system featuring an image intensifier and a 35 mm TV and cine camera, a new method was introduced for performing extracardiac studies using 35 mm cine.

- 1965: With the incorporation of a system featuring an image intensifier and a 35 mm TV and cine camera, a new method was introduced for performing extracardiac studies using 35 mm cine.

- 1966: The treatment of neoplasms through intra-arterial chemotherapy via catheterization was initiated under the direction of Dr. Carlos A. Garlando.

- 1966: Dr. Raúl Oliveri inaugurated the Coronary Unit, the second in the country.

- 1966: Upon the arrival of Dr. Enrique Fierenz, the first coronary angiographies in the country were performed using 35 mm cine.

- 1968: Dr. Enrique Efraín Leguizamón continued the development of coronary angiography but soon after returned to the United States. Doctors Garlando and Fiore took charge of performing coronary studies, building on the experience gained from their predecessors.

- 1970: Doctors Leguizamón, Garlando, and Fiore won the Cardiology Award from the Faculty of Medicine, University of Buenos Aires, "Dr. Luis Sívori."

- 1971: Dr. Favalaro returned permanently to Argentina at the peak of his career to operate at Sanatorio Güemes, following several attempts to join our institution.

CONCLUSIONS

This article examines the role of Cardiology at Hospital Italiano de Buenos Aires in the advancement of Hemodynamics in Argentina. Along its path of growth, noteworthy events are recounted, and distinguished figures in cardiology are recognized –individuals who, through their direct involvement or mere presence, brought prestige to the fields of Cardiology and Hemodynamics. Dr. René Favalaro's persistent desire to carry out his surgical work at our institution is a testament to its reputation.

- First coronary angiographies in Argentina.

- Dissemination of dynamic angiography in peripheral cine studies.

- Angiographies and intra-arterial chemotherapy for tumors.

- Recognition of Drs. Carlos A. Garlando and Carlos Fiore, the first hemodynamics specialists trained at Hospital Italiano.

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