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Editorial

In Memoriam: Paolo Angelini (1941-2023)—A Pioneer and World-Leading Expert in Coronary Artery Anomalies. A Tribute From the International Coronary Artery Anomalies Collaborative (ICAAC)

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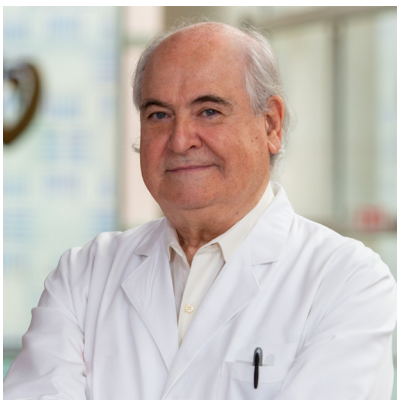

Paolo Angelini, MD

We are deeply saddened by the passing of Dr Paolo Angelini, an esteemed cardiologist, ground-breaking researcher, and beloved friend, on July 29, 2023. He departed from us at the age of 81, leaving behind a legacy of remarkable advancements in cardiovascular medicine for more than half a century. Born in Italy, Dr Angelini began his distinguished journey in medicine by earning his medical degree from the prestigious University of Milan in 1966. His interest in cardiology propelled him to pursue a residency at the National Institute of Cardiology in Mexico City, Mexico, under the expert guidance of the renowned Dr Ignacio Chavez. His innovative contributions to cardiovascular medicine did not go unnoticed, attracting the attention of 2 eminent figures in the field, Dr Robert Leachman and Dr Denton Cooley. This recognition eventually led to his appointment at The Texas Heart Institute, where his legacy will live on through his many important contributions. During the 1980s, Dr Angelini played a pivotal role in the development and prototyping of innovative devices for invasive coronary balloon angioplasty, working closely with the procedure's inventor, Dr Andreas Grüntzig, at the Kantonsspital Zürich (now University Hospital Zurich), in Switzerland. Though Dr Angelini demonstrated a keen interest in several areas of cardiology, such as interventional cardiology in coronary artery disease, Takotsubo cardiomyopathy, and noncompaction cardiomyopathy, he channeled a considerable part of his passion toward exploring the uncharted territories of coronary artery anomalies. His persistent inquiry into this complex field of study is still cherished and celebrated internationally among experts in the field. Dr Angelini's extensive research led to impressive contributions to the scientific literature on coronary artery anomalies, reinforcing his stature as an innovator and global expert on this topic. His pioneering publication in 2002 on the embryology, incidence, and pathophysiology of coronary artery anomalies[1] has been cited more than 1,300 times, demonstrating the profound impact of his work. His seminal research, "Coronary artery anomalies: an entity in search of an identity," published in *Circulation* in 2007,[2] is a cornerstone reference for clinicians and researchers across the world. He was one of the first to decipher the true pathophysiology of coronary artery anomalies with dynamic compression of the intramural course (IM)—that is, the course of the anomalous vessel within the tunica media of the aortic wall—not the outdated misconception of the scissorlike com-

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pression of the interarterial course.[2] He was furthermore a believer that all high-risk populations, including elite athletes and military recruits, should undergo screening for coronary artery anomalies,[3,4] which has generated an important, ongoing discussion among scientific societies in cardiovascular medicine worldwide. He was a staunch believer that not all anomalies should be treated similarly but rather managed based on the presence of high-risk morphologic features, such as the IM and others (ostial stenosis) that lead to the impairment of intracoronary flow and ultimately to myocardial ischemia, which triggers sudden cardiac arrest or death, especially in the young and during effort. He promoted the intravascular ultrasound imaging approach to document anatomy, IM, and stenosis as well as dynamic compression under pharmacological stress testing. Several key publications written by Dr Angelini advocated for the use of stent angioplasty as an alternative to surgical revascularization in managing hemodynamically relevant coronary artery anomalies in adults.[3] This approach has garnered substantial interest within the medical community, serving as a testament to his forward-thinking and innovative mindset.

Dr Angelini, with his sharp intellect, indefatigable spirit, and deep empathy, was an exemplar as both a researcher and a human being. He inspired us all to push boundaries, to look forward, and to challenge common principles to reach higher levels of understanding and, ultimately, to improve the lives of patients affected by coronary artery anomalies. He became an integral part of the international collaborative group on coronary artery anomalies we developed, and we often engaged in lively dialogue on this topic. Our discussions with him were intellectually stimulating and sometimes challenging, owing to his discerning perspectives on coronary artery anomalies, especially as they related to risk stratification of these lesions in childhood, where invasive procedures are not an easy choice. His attention to detail and comprehensive understanding of the embryology and pathophysiology of coronary artery anomalies have been invaluable to our collective learning. We, as an international group of physicians interested in coronary artery anomalies, remember our rigorous debates about the terminology used in our field of interest. Dr Angelini had a precise viewpoint and was a strong proponent of a more refined but simplified nomenclature for coronary artery anomalies (ie, anomalous coronary artery from the opposite sinus of Valsalva) as opposed to the more generic term, accepted in the congenital heart disease nomenclature, "anomalous aortic origin of a coronary artery."[3] He underlined this in a recent letter to the editor with the title "Can we talk? The residual, urgent questions about surgery for coronary artery anomalies,"[5] in which he highlighted that the IM is the most important feature to mention because it can individually identify the implied mechanisms of possible dysfunction or the generic absence thereof. This underscores his fervor for meticulousness and exactitude within scientific discourse. His tenacity in ensuring clarity and thoroughness of thought was unwavering, even when faced with individuals struggling to follow his intellectual rigor. We remember fondly engaging in discussions about how to narrow the gap between the mechanisms that lead to myocardial ischemia in the developing organism compared with the adult, usually over a cup of coffee in the office—although, to quote him, "vino" could have served us better.

Abbreviations and Acronyms

IM	Intramural course

Dr Paolo Angelini was not just a colleague but an esteemed collaborator and dear friend whose energy and passion for science were contagious. His wit, passion, and the humaneness he exhibited in his interactions were truly inspiring. We will always cherish these enlightening discussions as they have tremendously helped shape our understanding and approach toward coronary artery anomalies and encouraged us to generate further evidence to advance the field. The indelible legacy left by Dr Paolo Angelini serves as a guiding beacon for all practitioners dealing with coronary artery anomalies, inspiring us to improve cardiovascular care and make the lives of these patients and their families better, empowering them to live rather than simply to survive. We will truly miss you, dear friend. The world is less bright today as we lack your enlightening spirit among us, but we hope that you will continue to support us in spirit. Rest in peace, dear Paolo.

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