



Minimally Invasive Aortic Valve Implantation Offers New Hope to Stenotic Patients

Since 2008, the Angiografia de Occidente cardiology group has performed 70 percutaneous aortic valve implantations. Siemens Artis zee imaging equipment is considered “indispensable” for the implants.

In Europe, the procedure is rapidly becoming standard practice for elderly patients unsuitable for open-heart surgery.

By Chris Kraul



Essential for the TAVI procedure is Dr. Antonio Dager's Artis zee system, which is equipped with syngo DynaCT Cardiac. It generates precise three-dimensional images that can be rotated.

The city of Cali in southwestern Colombia might not leap to mind as a hotbed of cutting-edge medical technology, but Dr. Antonio Dager and his Angiografia de Occidente clinic are in the vanguard of nothing less than a revolution in minimally invasive cardiovascular procedures that is being helped along by Siemens Artis® zee imaging systems.

Since March 2008, Dager and his associates have performed 70 transfemoral aortic valve implants (TAVIs), more than any other clinic in South America. In all cases, Artis zee® equipment was used to help diagnose the disease, usually aortic stenosis, and place the implants. Although not yet approved by the U.S. Food and Drug Administration (FDA), the relatively new procedure is rapidly becoming stan-

dard care in Europe, Canada, and Latin America for elderly stenotic patients with comorbidities who are not eligible for open-heart surgery because of their high-risk status.

Due to the relatively high volume of implants and Dager's success rate of 96 percent, his clinic was named in November 2010 to participate in a Medtronic-sponsored study of angioplasty centers worldwide that tracks the effectiveness of aortic valve implants. Medtronic is one of the principal manufacturers of the valves.

The nine Siemens imaging systems that Dager's clinic uses are "indispensable" for the 8,000 procedures – divided evenly between diagnostic procedures and angioplasties – that Dager and three other inter-

ventional cardiologists at Angiografia de Occidente perform annually at seven locations in Cali, Popayan, and Pereira.

Essential for the 45-minute TAVI procedure is his Artis zee system, which is equipped with syngo® DynaCT Cardiac for rotational angiography. It generates precise three-dimensional images that can be rotated, enabling him to see the aortic root from all angles. "It's better than life. It helps me pinpoint the exact place in the inferior portion of the aorta to align the TAVI device. At first there was a lot of mispositioning, but with DynaCT, results have improved significantly over the last three years," Dager said.

For pre-procedural TAVI planning Dager also makes use of computed tomography (CT). With the Siemens SOMATOM®



With his team at Angiografia de Occidente in Colombia, Dr. Antonio Dager has performed 70 transfemoral aortic valve implants (TAVIs) – more than in any other clinic in South America. In all cases, Artis Zee equipment was used to help diagnose the disease and place the implants.

Definition CT scanner, he is able to precisely determine size, morphology, and position of the diseased aortic valve. Furthermore, the distance of the coronary ostia to the aortic annulus can be accurately assessed.

The Way We Have to See It

“Without this equipment, our work would be impossible. It can show with great definition the anatomy the way we have to see it,” said Dr. Bernardo Caicedo, Dager’s

partner at Angiografia de Occidente. Adds Dager: “These systems are an extension of your senses, your mind, and your thoughts about the patient’s condition. You can think out a case as you do the procedure, because the feedback and capture are instantaneous.”

The systems also feature Siemens low-dose radiation technology that, for several reasons, makes the procedures significantly safer for patients and medical staff: Better images let Dager see organs and

the progress of the guide wire more clearly, which reduces the time – and radiation – needed to make a diagnosis or place the implant. Advanced features like automated selection of filters, dose-free repositioning of collimator blades and table as well as low dose acquisition protocols reduce the exposure. The upshot is that a typical angioplasty now requires significantly less radiation than a typical procedure a few years ago. “Angiography systems used to disperse radiation indiscriminately in a cone-like path. Now, it is very targeted,” says Dager. He speaks English with a faint Cajun accent, having spent some of his teenage years in New Orleans, where his father was Colombian consul. Dager’s day starts at 7:30 a.m. and sometimes does not end until 10 p.m. if he has a “papa caliente” – Spanish for “hot potato”, or emergency. On average, Dager performs ten diagnostic and interventional procedures per day, some lasting a few minutes, some up to three hours.

Among the 70 TAVIs he and his partners have done were eight U.S. patients who came to Dr. Dager’s clinic in Cali at the insistence of cardiologists at the University of Miami Miller School of Medicine, with which Dager maintains close ties. The referrals usually come, he says, because the patients do not qualify for insurance reimbursement, and having the implant done at Angiografia de Occidente costs half as much as the cost of the procedure at a U.S. clinic.

A Dream Come True

Dager’s relations with the University of Miami medical school date from 1985, when he was accepted as a four-year cardiology and hemodynamics fellow under the school’s William J. Harrington Program for Latin American medical students and physicians. He cites the program as the source of much of his professional success and of his enduring passion for following the state-of-the-art in medical technology. By the time Dager began his fellowship in Miami, the Cartagena native had already spent a decade in general and intensive care practice in Cali after attending the Universidad del



"Indispensable", is Dr. Antonio Dager's verdict on the nine Siemens imaging systems that the Angiografia de Occidente clinic uses for the 8,000 procedures he and his team perform annually.

Valle medical school there. But he had always hoped to specialize in cardiology, particularly after a beloved uncle died of aortic stenosis in 1974, when the diagnosis was a virtual death sentence. The Harrington fellowship helped him realize his dream. Upon his return to Cali in 1989, he founded Angiografia de Occidente with Dr. Caicedo, a close friend who was his chief resident during his internship in 1974.

Better Survival Rates

Dager also gets referrals because the results of the TAVIs are so compelling. Patients in their 70s diagnosed with aortic stenosis who receive the implanted valve have a 77-percent likelihood of surviving the first year and a 69-percent chance of surviving two years, results that are roughly similar to a Canadian study, Dager says. Those who do not receive implants have only a 50-percent survival rate one

year after diagnosis and only 30-percent chances of survival after two years. In their nearly four decades in medicine together, Drs. Dager and Caicedo say they have witnessed a demographic shift in patient population due to Colombia's modernizing and urbanizing population. "We're in the midst of an epidemic in diet-related heart diseases. Lifestyles have changed from home cooking and daily siestas to more junk food and stress. As a result, we see lots more atherosclerotic and peripheral artery disease than we did 20 or 30 years ago. Stenoses get detected in patients' 40s and 50s instead of their 60s and 70s," says Dager.

Acceleration in Procedures Foreseen

That shift (which is in progress in varying degrees around the world), together with the growing success rate in TAVI procedures, is why experts are projecting a

rapid acceleration in percutaneous aortic valve replacements in coming years. The procedures have already taken off in Europe, where more than 20,000 TAVIs have been performed up to now, up from only 1,000 in 2007, Dager says. He believes it is just a matter of time before the FDA approves TAVIs, and he has no fear he will lose patients from the U.S. On the contrary, with aging population, the need for aortic valve replacements will further increase, and possibly also among younger patients, who are more likely these days to receive implants via open-heart surgery. "An FDA approval will give it the bona fides it needs, and worldwide demand will go up," Dager asserts.

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