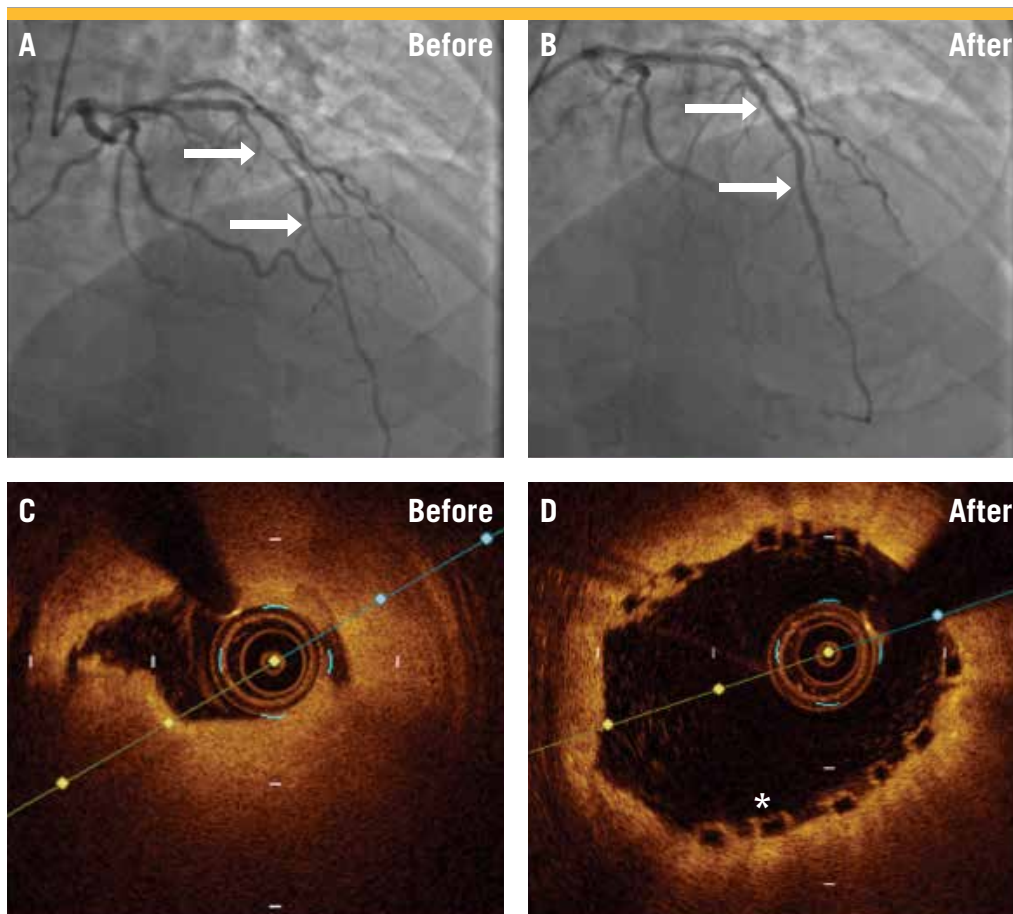


First dissolvable cardiovascular stent is FDA-approved and available at UCLA



Panel A: Angiogram of the left anterior descending (LAD) before stenting. Arrows are pointing to two areas of severe blockage. Panel B: Angiogram of the LAD after stenting with bioabsorbable stents. Arrows are pointing to the stented segments, but unlike metallic stents, the bioabsorbable stents cannot be seen on X-ray. Panel C: Optical coherence tomography (OCT) imaging of the LAD before stenting showing a very small lumen. Panel D: OCT imaging of the LAD after stenting showing wide expansion of the artery. Asterisk is next to one of the struts of the bioabsorbable stent. All the stent struts are apposed to the artery wall.

UCLA Health Interventional Cardiology is now offering the first FDA-approved bioabsorbable stent to patients with coronary artery disease requiring coronary stenting. The stent is known as Absorb Bioresorbable Vascular Scaffold system — or Absorb BVS.

Evolution of stents

Coronary artery disease (CAD) is the most common type of heart disease, resulting in the deaths of more than 370,000 Americans annually. The disease is characterized by plaque buildup that constricts the arteries that supply blood to the heart. The condition leads to chest discomfort (angina), shortness of breath and increased risk of heart attack.

Assessing long-term function of new stent

The main questions regarding bioabsorbable stents are whether they can decrease the rate of restenosis and improve a patient's quality of life, says William Suh, MD, UCLA assistant clinical professor of cardiology.

“We think there are some potential benefits to the Absorb stent,” says Dr. Suh. “A metallic stent is permanently embedded in the artery and can cause chronic inflammation leading to late restenosis. Also, if you have a stiff metal tube, the artery can't expand and contract with each heartbeat like a normal artery can. With the bioabsorbable stent, the artery is able to regain its normal function after the stent disappears. Reducing restenosis and restoring normal artery function can lead to improved coronary blood flow and less angina. However, we will need to wait for the long-term follow-up from clinical trials to know if these potential benefits are a reality.”

The Absorb stent represents almost three decades of research on improving treatments for coronary artery disease. Dr. Suh notes, “We see a number of patients who are reluctant about having stents put in because they don't like the idea of having something permanent inside their body. The Absorb stent now gives these patients a new option.”

Percutaneous coronary intervention with stenting is a common procedure for the treatment of CAD. Stenting reopens blocked arteries to restore blood flow and alleviate symptoms. Cardiac stents have been in use for almost three decades, and numerous improvements have been made to the devices.

Early bare-metal stents were associated with a 20 to 30 percent restenosis rate requiring reintervention. In 2001, drug-eluting stents were introduced to lower the rate of restenosis. Today, most stents placed in the United States are drug-eluting stents. Nevertheless, these stents are still associated with some risk of restenosis as well as stent thrombosis.

Absorb naturally dissolving stent

The Absorb Bioresorbable Vascular Scaffold system is a temporary device made of polylactide, a naturally dissolvable polymer that is commonly used in medical implants, such as dissolving sutures. The polymer is broken down to lactic acid, which is converted to pyruvate, enters the Krebs cycle and is metabolized into carbon dioxide (escapes the body via the lungs) and water (excreted via the kidney in urine). The stent also contains the drug everolimus, which has been shown to inhibit in-stent neointimal growth in the coronary vessels. After the stent is placed, it acts like a drug-eluting stent to keep the artery open. However, the Absorb stent dissolves over three years, leaving a restored and fully functioning artery.

The benefits of a bioresorbable scaffold over a metallic stent are not immediate. Both types of stents have similar efficacy in restoring normal coronary blood flow and reducing symptoms. Both stents have similar safety endpoints in the first 12 months after implantation. The major difference begins when the stent loses its mechanical support of the vessel (after about six months) and until the stent is completely resorbed (at about three years). After the stent is gone, the vessel has regained normal vasomotor function (the ability to dilate and constrict). Importantly, the late complications that can occur with metallic stents, including very late stent thrombosis and neoatherosclerosis, are eliminated.

The first Absorb stent was implanted at Ronald Reagan UCLA Medical Center on September 27, 2016. The Absorb stent is also available at UCLA Medical Center, Santa Monica.

UCLA interventional cardiologists are currently researching potential applications of bioabsorbable technologies in the treatment of transplant allograft vasculopathy, peripheral arterial disease and congenital heart disease.



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