Jefferson University Hospitals

Heart Facts

SMALL-VESSEL STENTS

Any discussion on small-vessel stents requires background information on coronary artery disease – a condition in which fatty deposits accumulate in the cells lining the wall of the artery and obstruct blood flow. The inadequate supply of blood to the heart muscle damages the heart. Untreated, patients may experience angina – chest pain that occurs when the heart isn't receiving enough oxygen. Blocked arteries can also lead to a heart attack.

Cardiologists treat coronary artery disease by opening up these blocked blood vessels. In the past, open-heart surgery was the only way to accomplish this. Today, however, there are innovative medical strategies and technologies that do not require surgery. If symptoms of heart disease do not respond to drugs, diet and lifestyle changes, a cardiologist may recommend an angioplasty and stent. The combination of these two non-surgical procedures – the medical term for which is percutaneous coronary intervention (PCI) – has been highly successful in opening up blocked blood vessels and diminishing the chance that a blockage will recur.

What is a stent?

Balloon angioplasties have been the most common non-surgical technique for opening clogged arteries in patients since the 1980s. More recently, though, studies have shown that patients who also receive an implanted device called a stent were less likely to require additional angioplasties or bypass surgery in the future.

A coronary stent is a mesh tube the size of a spring in a ballpoint pen. The stent is placed in the artery to hold it open after the angioplasty balloon has cleared the blockage. About 70 percent of patients receiving balloon angioplasties today are now treated with stents as well to improve their odds of a successful outcome.

How does a stent help?

A stent can be used alone but is typically inserted following an angioplasty procedure. Placing a stent in a cleared vessel has been shown to cut the risk of subsequent blockages in half by keeping the arteries wide and reducing the incidence of re-closure. The device usually relieves the chest pain of angina, and the benefits are longer lasting than an angioplasty on its own.

Another significant advantage is that only a small incision is required for a stent as opposed to invasive bypass surgery. The non-surgical stenting procedure entails less pain and a shorter recovery time. While helping to restore normal blood flow, stents also keep the artery open if any damage occurs from the catheter during the angioplasty. Overall, the complication rate of angioplasty goes down too when a stent is used.

What is the advantage of the new small-vessel stent?

First introduced in the early 1990s, stent design has steadily improved to offer greater effectiveness, more variety in size and minimal trauma.

Jefferson cardiologists have pioneered the use of small-vessel stents for tiny and hard-to-reach heart vessels. These compact stents being used by top cardiologists today have the ability to reach lesions in small blood vessels which were previously difficult to access. The ultra-smooth surface of the small-vessel stents also promotes proper blood flow, thus reducing the possibility of thrombosis (blood clots), a particular risk when stenting small vessels.

How is a stent inserted?

A physician trained as an interventional cardiologist performs the procedure, which usually starts with the angioplasty. An incision the size of a pencil tip is made. Guided by X-ray images, the doctor threads a balloon-tipped catheter through the arterial system and into the obstructed coronary artery. At the end of the catheter is the stent, a small flexible tube made of plastic or mesh.

Next, the physician inflates the angioplastic balloon to force the plaque against the arterial wall; in the large majority of cases, this opens up the obstructed artery. This balloon inflation also causes the stent to expand and press against the vessel wall.

Once the angioplasty balloon is deflated and removed, the stent stays in place permanently to hold the blood vessel open. New cells and tissue slowly grow over the stent and eventually cover the surface.

Are there any risks or possible complications associated with stents?

Stenting is a safe procedure with a small risk of complications such as blood clots (which may cause heart damage) and scar tissue (causing restenosis, or recurrent blockage). In all, the medical risks of the angioplasty and stent are usually lower than for heart bypass surgery (which is more difficult for small arteries).

Are stents beneficial for anyone with coronary artery disease?

Stents are used to treat a wide variety of patients with narrowing or clogged arteries. The indications for using a stent can be angina (chest pain) or a heart attack. Or sometimes, stents are inserted as a temporary measure for cardiac patients who are not fit for surgery.

The size of the obstructed artery and location of the blockage will determine whether a stent is a suitable treatment and what size is required. Most, but not all, patients with blocked arteries are candidates for stents.

What should I expect after the procedure?

Most people stay in the hospital for only one night following an angioplasty and stent. Full recuperation may take several days. Patients may feel mild chest pain initially from the stretched artery. After stenting, patients also must take blood-thinning agents to help prevent re-closure of the artery. Aspirin is recommended indefinitely and an anti-platelet agent – clopidogrel (Plavix®) – is prescribed for up to one year.

For an appointment with a Jefferson physician, please call **1-800-JEFF-NOW** *(1-800-533-3669) or visit our Web site at* **www.JeffersonHospital.org.**

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