



RENAL STENTING DECREASES RISK OF HEART DISEASE AND STROKE

Sam lined up the prescription bottles on the counter. The sixty-seven-year-old retired electrician remembers when he took only one pill a day for his high blood pressure. Then his family doctor told him that he needed to add another medicine. When his blood pressure still wouldn't come under control, Sam's doctor prescribed a third drug. Despite the additional medication, the problem persisted.

Sam represents about five percent of the population (generally in their 50's and older) whose high blood pressure is caused by a condition called renal artery stenosis. Over time, a build-up of fatty substances has collected in the arteries leading to his kidneys. This plaque has caused his renal arteries to narrow and limit the blood flow to the kidneys. Sam's doctor explained to him that when blood flow becomes restricted, the kidneys release a hormone that increases blood pressure to help the blood get to his kidneys. This increased blood pressure is a cause for concern and greatly increases the risk of heart disease and stroke.



Renal stenosis is also caused by a disease of the arteries called fibromuscular dysplasia, which primarily affects young to middle-aged women. While some patients respond well to medication, others like Sam require additional treatment. Through the use of a procedure known as renal stenting, Carolinas Hospital System is able to offer patients a non-invasive approach to addressing narrowed renal arteries. Dr. Charles Stonerock, a general and vascular surgeon, joined the Carolinas Hospital System medical staff in 2006, bringing with him extensive experience in renal stenting.

Patients with renal stenosis are referred to Dr. Stonerock with out-of-control blood pressure like Sam's and/or kidney function that has progressively declined. "Most of these patients come in with a recent worsening of their blood pressure within the last six to ten months. At this point, I have to make a determination on intervention," he said.

If Dr. Stonerock decides that a patient can benefit from renal stenting, the procedure is scheduled in the Cardiac Catheterization Lab or in a specially designated room in the Radiology Department. A thin tube or catheter is inserted through the patient's groin and guided to the affected artery. A stent, which is a tiny wire mesh device, is placed into the narrowed artery. When the stent is expanded (to approximately $\frac{3}{4}$ inch in length and $\frac{1}{4}$ inch in diameter) it provides support to keep the artery open, restoring normal blood flow. "Most of the time the narrowing occurs right where the artery comes off the aorta. There is usually a lot more disease there," he explained. Normally one stent is used, though occasionally a surgeon will need to insert two. Over time, the inner lining of the artery will grow over the stent, making it a permanent structure in the artery.



Sometimes renal stenting is used as a follow-up for a patient who previously had a balloon angioplasty. In this procedure, surgeons insert a small balloon into a renal artery with a catheter. The balloon is inflated to compress the plaque against the wall of the artery. Once the narrowed area is opened, the balloon is deflated and removed. Over time the narrowing in the artery can recur, necessitating additional medical attention. "Most physicians are now primarily doing stenting instead of angioplasty," said Dr. Stonerock, noting that "the longevity of the repair is much better with the stent."

Once a renal stent is inserted, patients need to be followed medically on a regular basis to make sure the artery is staying open and receiving good blood flow. This means ultrasound testing every six months for two years and generally once annually after that. "The stent is in there forever; it's certainly not ever coming out. Yet, we have to continue doing surveillance. Sometimes with recurrent disease we have to go back in," Dr. Stonerock said.

Dr. Stonerock noted that stents tend to be a better option when the narrowing is confined to a short area. Patients whose renal stenosis is more diffuse may require renal artery bypass surgery in which a detour is made (from one of the patient's veins or a man-made graft) to create a new route to bring blood to the kidneys. Bypass surgery is also utilized in instances when the structure or condition of a patient's arteries make stenting impossible. For his patients that can undergo stenting as opposed to bypass surgery, the process is certainly a much less complex one. The procedure takes about an hour and only local anesthesia is required. Most patients spend the night at the hospital (a minimum of four to six hours of bed rest is prescribed) and go home the next day.

As Dr. Stonerock educates his patients, he's clear with them that renal stenting is not a cure. "The disease can always recur and these patients rarely get off all their high blood pressure medicines. With 80 to 90 percent of patients, the ultimate goal is to stabilize the disease process and to eliminate a medication or two required for high blood pressure," he said.