Atrial fibrillation, the most common heart rhythm abnormality, affects 2 to 3 million people in the United States, a number projected to increase to 12 million by 2050 as the population ages, according to the U.S. Centers for Disease Control and Prevention. Atrial fibrillation also increases stroke risk, which usually is mitigated by anti-coagulation medicines, unless the patient is at high risk for bleeding and unable to tolerate these medicines. Now, more options are available for such patients.

In atrial fibrillation, the heart rate tends to be fast and irregular. Many patients complain about heart palpitations, a sensation of racing heart or skipped beats. Other patients experience no symptoms. “A-fib” is related to about one-fifth of all strokes occurring in the U.S. (approximately 500,000 per year), and these strokes tend to be more devastating and lethal than those related to other conditions,” said Peter Ott, MD, associate professor of clinical medicine and director of the Electrophysiology Laboratory and Arrhythmia Services at University of Arizona Medical Center and Sarver Heart Center. “Anticoagulation therapy (blood thinners) reduces the risk of stroke by approximately 80 percent. Blood-thinning medicine, such as warfarin (Coumadin), is the route to go for the vast majority of a-fib patients. Newer anticoagulants are equally effective in stroke prevention compared to warfarin. Some patients, however, do not tolerate anticoagulants, especially if they are at excessive risk for bleeding.”

Lassoing the Source of Stroke-Causing Blood Clots

The left atrial appendage (LAA), a 1- to 2-inch long windsock-like structure, which extends off the upper chamber of the left side of the heart (left atrium), is the most common site for clot formation inside the heart of patients with atrial fibrillation. (See images on page 5.) If a blood clot forms here and breaks off, it can travel through the blood stream and lodge in the brain, causing a stroke, or lodge in other parts of the body.

Surgical and new, less-invasive catheter options have been developed to tie off the LAA.

Ranjith Shetty, MD, assistant professor of medicine in cardiology, has expertise with the LARIAT procedure. In this procedure, a catheter is guided through the heart chambers into the left atrial appendage and meets up with a catheter inserted under the chest bone into the pericardial sac that surrounds the heart, traversing on the outer surface of the heart to the outside tip of the left atrial appendage. The LARIAT snare then follows this outer catheter and is positioned to tie off the LAA at its base, thereby excluding the LAA from the body of the heart and the blood stream. “A benefit of this procedure is that a patient who is not tolerating anticoagulation medicines can stop taking these drugs right away,” said Dr. Shetty.

Cardiothoracic surgeon Zain Khalpey, MD, PhD, associate professor of surgery, uses a surgical clip to tie off the LAA at its base. “This procedure particularly is good in cases where the CT surgeon is doing open-heart surgery for another reason such as heart valve surgery or coronary artery bypass surgery,” said Dr. Ott.

If tying off the LAA reduces the risk of stroke in patients with atrial fibrillation, why don’t we do this on everybody?

First of all, the stroke risk varies between patients ranging from less than 1 percent per year (cases where aspirin is recommended) to greater than 10 percent per year. Secondly,
approximately 20 percent of patients have anatomic hurdles that prevent the LARIAT snare from snagging the LAA. (For example, the LAA tip points to the back and not the front.) Others may have scarring in the sac of the heart from prior heart surgery that precludes inserting the LARIAT snare. Last but not least, this procedure carries potential serious complications; the most feared one is tearing a hole in the heart chamber when deploying the LARIAT snare suture.

“It’s important to remember that the LARIAT is an option to reduce the risk of stroke in atrial fibrillation patients who cannot tolerate anticoagulation therapy because they have had significant bleeding complications,” said Dr. Shetty. “The hope is that the LARIAT reduces the risk of stroke in these patients with atrial fibrillation who have no alternatives for stroke prevention as much as oral anticoagulation, but this has not yet been proven in clinical trials.”

Reducing the risk of stroke in atrial fibrillation patients is just one aspect of treatment of this heart condition. Treatment of the a-fib itself may focus on achieving and maintaining a normal heart rhythm (rhythm control strategy) or may focus on maintaining a normal heart rate (rate control strategy). To obtain normal rhythm, anti-arrhythmic drugs, such as flecainide, sotalol, amiodarone and dofetilde are used. In most patients, rate control strategies are recommended, since anti-arrhythmic drugs have significant side effects.

In highly selected patients who do not tolerate rate control, and do not respond to anti-arrhythmic drugs with persistent disabling a-fib symptoms, catheter ablation of the left atrium can be performed by an electrophysiologist. While this procedure is not considered a cure for atrial fibrillation, it can make managing the arrhythmia with antiarrhythmic drugs more successful in some patients. In long-term follow up, atrial fibrillation may reoccur.

Patients with atrial fibrillation undergoing cardiac surgery for heart valve or coronary bypass procedures may benefit from a MAZE procedure, in which the surgeon delivers ablation lesions to the left atrium, akin to the catheter ablation procedure.

“The best treatment strategy is individualized and requires careful evaluation of the patient-specific findings by the treating physician,” says Dr. Ott. These new procedures are part of an overall program of options available to control atrial fibrillation.

**Prevention: Always the Best Option**

Since atrial fibrillation is strongly linked to high blood pressure and other forms of heart disease, as well as obesity and sleep apnea, every effort should be made to avoid these conditions by healthy lifestyle choices, such as smoking cessation, regular exercise and only modest alcohol use. Once hypertension or heart disease is present, aggressive medical therapy is mandatory to minimize the risk of future development of atrial fibrillation.

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More heart health information is available on the University of Arizona Sarver Heart Center website: heart.arizona.edu.

We welcome your questions, suggestions and comments. Please email us at heart@u.arizona.edu.