Carotid Stent System Gets FDA Nod, With Conditions

BY ELIZABETH MECHCATIE
Senior Writer

The Food and Drug Administration's latest approval of a carotid stent system came with a list of postmarketing study commitments that includes monitoring outcomes in recipients and evaluating training programs for physicians using the device.

In January, the FDA approved the Protégé GPS and Protégé RX carotid stent systems for treating patients with carotid artery disease who are at high risk for adverse events from carotid endarterectomy. The FDA requires use of the embolic protection devices made by the same company, approved by the FDA in February 2006, with the stent.

Candidates for the stent must meet the following criteria:

► They must have stenosis of the common or internal carotid artery measuring 50% or greater if they are symptomatic, or 80% or greater if they are asymptomatic (as determined by ultrasound or angiography).

► They must have a reference vessel diameter within the range of 4.5 mm and 9.5 mm at the target lesion.

The Protégé carotid stent system, with the embolic protection device, was studied in the prospective, nonrandomized, multicenter Carotid Revascularization With ev3 Inc. Arterial Technology Evolution (CREATE) trial of 419 patients with carotid artery disease who were at risk for stoke and at high risk for adverse events from surgery.

The risk of death, stroke, and MI at 30 days, or any stroke in the area of the blockage at 1 year, was similar to the rate of complications reported in the literature from patients undergoing surgery, according to the FDA. The study also showed that the stent still maintained blood flow to the brain more than 1 year after the procedure.

As part of the approval, the manufacturer, ev3, has agreed to conduct a long-term follow-up study of patients from the CREATE study to evaluate the effectiveness and safety of the stent through 3 years after its implantation, according to the FDA approval letter. This will include performing a clinical exam, carotid duplex ultrasound, and neurologic exam annually. The company also will conduct a postapproval study of at least 1,500 patients from high-, moderate-, and low-volume centers who were treated by physicians with different categories of training. The study will evaluate the composite rate of death, ipsilateral cerebrovascular accident (CVA), procedure-related CVA, or MI 30 days after the procedure in 1,000 patients. This study also will follow these patients and determine the rate of ipsilateral stroke at 12 months.

Plymouth, Minn.–based ev3 Inc. manufactures the stents and the distal filter embolic protection device. The filter is marketed as the SpiderRX Embolic Protection Device. ■

Refined Techniques, Good Management Can Improve Carotid Stenting Outcomes

BY MITCHEL L. ZOLER
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Hollywood, Fla. — The safety of carotid stenting in high-risk patients is enhanced by improved stenting techniques and patient management, Dr. Jay S. Yadav said at the 19th International Symposium on Endovascular Therapy.

Start treatment with clopidogrel a week before the stenting procedure, rather than relying on a loading bolus.

DR. YADAV

Improved strategies for placing carotid stents are critical, especially when treating elderly or symptomatic patients, said Dr. Yadav, cofounder and CEO of a medical device company in Atlanta and former director of endovascular services at Piedmont Hospital, also in Atlanta. He reviewed several steps to boost stenting safety.

Although access through the aortic arch poses a major stroke risk, it can be reduced with alternative access routes and better equipment. Dr. Yadav recommended an Ansel sheath and a hooked Simmons catheter to navigate through a stenotic arch. These tools can be introduced from either a brachial or femoral artery, and can reach either the left or right carotid artery.

Another tip is to be sure the embolic protection device is properly positioned—in a straight segment of the distal carotid artery. If the device is placed in a curved region, debris might slip by. In a straight segment, it's easier to fit the device snugly.

Embolic filters can also slow or arrest blood flow, especially when filters are distal to large, soft plaque. In such cases, the column of blood that's trapped proximal to the filter should be aspirated before the filter is collapsed and withdrawn. If such stagnant blood isn't removed, trapped particles can embolize on withdrawal, Dr. Yadav said.

Another tip is to minimize filter deployment duration. Once an embolic protection device is deployed, stenting should start and finish within 5 minutes. In a recent study, patients with a filter in place for more than 20 minutes had double the risk of stroke, versus patients with shorter dwell times.

In certain highly challenging cases with very stenotic vessels, deployment of two distal protection devices can help ensure that all embolic material is trapped.

Proper management can also improve outcomes. Dr. Yadav suggested starting treatment with clopidogrel a week before the stenting procedure, rather than relying on a loading bolus.

During the procedure, patients should receive heparin or bivalirudin, with a target activated clotting time of 275-300 seconds. After stenting, patients should receive clopidogrel and aspirin for 3-4 weeks. ■

Clinical Effects of Stents Depend in Part on Design

BY MITCHEL L. ZOLER
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Hollywood, Fla. — The design and composition of carotid stents can have a major effect on their clinical impact, based on results from two separate studies.

Treatment with open-cell and large-cell carotid stents was linked to a substantial increase in the rate of periprocedural adverse events in symptomatic patients in a multicenter registry with more than 3,000 patients, Dr. Koen Deloose, department of vascular surgery, A-Z St.-Blasius, Dendermonde, Belgium, reported at the 19th International Symposium on Endovascular Therapy. His report expanded on similar findings from about 700 patients reported last year.

In addition, treatment with a self-expanding, nitinol carotid stent was linked with a twofold increase in the rate of periprocedural hypotension in a single-center review of 172 patients, Dr. Barry T. Katzen, medical director, Baptist Cardiac and Vascular Institute, Miami, reported at the same meeting.

A carotid stent's cells are the open sections on its surface that are formed by the wires of the stent. Cells can range in size from the 1.05- mm^2 spaces on the walls of a Wallstent to the 11.48-mm^2 spaces on an Acculink stent (see box). Stents with relatively small cells are also considered to have a closed-cell design, including the Wallstent, NexStent, and Xact stents. Stents with larger cells have an open-cell design.

Cell Area Varies Among Carotid Stents

Type of Stent	Cell Area (mm^2)
Wallstent	1.05
Xact	2.74
NexStent	4.70
Precise	5.89
Exponent	6.51
Protégé	10.71
Acculink	11.48

Source: Dr. Deloose

Dr. Deloose reported on 3,179 consecutive patients who received a carotid stent at one of four collaborating hospitals in Belgium and Italy during 1997-2006. About 96% were also treated with an embolic protection device. The most common stent used was the small-cell, closed-cell Wallstent, in 66% of patients. Next was the large-cell, open-cell Acculink stent, in 13% of patients. A total of seven stent types were used. There were no significant differences in baseline clinical factors among patients who received different stents.

The analysis correlated stent-cell size and design with the incidence of transient ischemic attacks, strokes, and deaths that occurred either during stenting or the first 30 days following treatment. An effect from cell size or design was only seen in symptomatic patients (patients with a history of transient ischemic attacks or minor strokes before treatment) but not in asymptomatic patients.

Among symptomatic patients, those who received stents with a cell size that was 5.0-7.0 mm^2 (either a Precise or Exponent stent) had about a threefold increased rate of bad outcomes, compared with patients who received a Wallstent, with a cell size of 1.05 mm^2. Patients who received a stent with a cell size of more than 7.0 mm^2, either an Acculink or Protégé stent, had an adverse event rate that was about 3.5-fold higher than in the Wallstent group, reported Dr. Deloose.

The impact of stent-cell size was also limited to late events—about two-thirds of events occurred after the stent was in place. In the subgroup of symptomatic patients who had late events, the rate was more than fourfold higher among patients who received stents with cells that were 5.0-7.0 mm^2, and about sixfold higher in patients who got stents with cells larger than 7.0 $mm,^2$ compared with patients who received stents with smaller cells.

Reduced adverse events were also found in patients who received closed-cell stents, compared with those who got open-stent designs.

Although a prospective, randomized study is needed to confirm a role for cell size and design on outcomes, "for the time being stents with a small free-cell area should be used in symptomatic patients," concluded Dr. Deloose.

The impact of stent design and composition on the incidence of periprocedural hypotension was examined in a review of 172 patients who received a carotid stent to treat a new lesion during January 1996-October 2006 at the Baptist Cardiac and Vascular Institute. The group included 31 patients who received a balloon-expandable, braided stent—the Wallstent—and 142 who received a self-expanding, nitinol stent. For this review, hypotension was defined as an episode of reduced blood pressure that required treatment with fluids or medications.

In the series, the incidence of all hypotensive episodes was about 40% in patients treated with nitinol stents, and about 19% in those who received a Wallstent, a statistically significant difference, reported Dr. Katzen. ■