

# Ambulatory Endovascular PAD Tx On the Rise

*Trend shows 'exponential' increase in outpatient procedures; shift associated with lower costs.*

BY DAMIAN McNAMARA

FROM THE ANNUAL MEETING OF THE SOUTHERN ASSOCIATION FOR VASCULAR SURGERY

NAPLES, FLA. – An exponential increase in ambulatory endovascular procedures for peripheral arterial disease is occurring in Florida, and it mirrors a nationwide trend, Dr. Michael S. Hong said at the meeting.

This shift to more ambulatory-based interventions is leading to decreases in open bypass procedures and major amputations, he said. This finding is from a study of discharges for peripheral arterial disease from Florida hospitals since 2000 and from ambulatory centers since 2004.

Approximately four out of five endovascular interventions for claudication, for example, are now performed in an ambulatory setting in Florida (approximately 8,000 vs. 2,000 done in a hospital setting), Dr. Hong said.

"With critical limb ischemia, the number of endovascular ambulatory interventions is much less than [that for] claudication, but we see an increase in the absolute number and in the proportion done in an ambulatory setting over time," said Dr. Hong, a research resident in the department of surgery at the University of Florida, Gainesville.

At the same time, inpatient procedures are still increasing for critical limb

ischemia, Dr. Hong said. "Inpatient endovascular procedures are predominantly now for more advanced peripheral arterial disease."

"Interventionists might consider these more dangerous and hence want to perform them more in the hospital," said study discussant Dr. Russell H. Samson, who is a vascular surgeon at Doctors Hospital of Sarasota (Fla.). In addition, critical limb ischemia repairs "are very equipment intensive and the equipment is expensive."

Importantly, overall patient safety has not been compromised with a move toward more outpatient procedures, Dr. Hong said. "From our data, with only two deaths and 20 transferred ... this shift to the ambulatory setting has not compromised patient safety."

He and his associates reviewed 10 years of ICD-9 inpatient codes and 6 years of outpatient CPT codes for endovascular angioplasty, atherectomy, and peripheral stent procedures. They also assessed ICD-9 codes for open bypasses.

Among the findings is that lower extremity bypass procedures in the state dropped from 5,294 in 2000 to 3,636 in 2008, a 31% decrease.

In just 5 years (2004-2008), ambulatory endovascular procedures grew from 3,014 to an estimated 6,670, which Dr. Hong described as "an exponential increase." (The 2008 figure is an annual projection based on data available

from the first three quarters of that year.)

In 2008, the number of endovascular interventions in both settings exceeded the number of open bypasses by nearly threefold (12,419 vs. 3,636). Although hospital-based endovascular procedures increased from 2,698 to 5,748 in 2008, "inpatient management ... numbers seem to have plateaued over the last several years," Dr. Hong said.

Dr. Samson commented, "There is a shift for performing these procedures from hospitals to outpatient settings. However, only 3% are being done in freestanding facilities and the rest are at centers affiliated with hospitals."

Dr. Hong confirmed that 97% of the ambulatory endovascular interventions were performed at hospital-affiliated centers, but added that some were done at freestanding cardiac catheter centers.

The researchers also assessed amputation numbers and trends. They found a 43% decrease in major amputations (defined as above knee to the ankle), from 2,833 in 2000 to 1,609 in 2008. At the same time, the number of minor amputations (from the forefoot to toe) remained relatively stable, from 1,354 to 1,362. "If you put them together with major amputations, the overall rate is down," Dr. Hong said.

Not surprisingly, the overall shift to ambulatory interventions was associated with "substantially lower charges overall," Dr. Hong said. The total mean charge for open bypass was \$62,946, compared with \$57,995 for hospital-based endovascular interventions and \$32,719 for ambulatory endovascular procedures. Total charges increased each year by approximately 21% in the hospital setting and by 10% in the ambulatory setting, he added.

**Inpatient procedures are still increasing for critical limb ischemia. 'Inpatient endovascular procedures are predominantly now for more advanced peripheral arterial disease.'**

One potential study limitation is the reliance on coder input into the AHCA (Agency for Health Care Administration) database. "But there is nothing here to suggest

any significant adverse problems so far," Dr. Hong said.

Another limitation of the study is that cost-to-charge ratios vary by hospital, Dr. Hong said. He added, however, that "a comparison between procedures still provides a good estimate of relative costs." Because AHCA is an administrative database, there was no clinical information on ankle brachial index or TASC (TransAtlantic InterSociety Consensus) lesion classification. Also, it is unknown if the deidentified data included patients who underwent multiple procedures.

Dr. Hong and Dr. Samson said that they had no relevant disclosures. ■

## Novel Technique Preserves Flow After Aneurysm Repair

BY MITCHEL L. ZOLER

FROM THE INTERNATIONAL SYMPOSIUM ON ENDOVASCULAR THERAPY

MIAMI BEACH – A novel, trifurcated, endovascular stenting procedure allowed preservation of blood flow through the internal iliac artery of patients undergoing repair of a thoracoabdominal aortic aneurysm or an aortoiliac aneurysm.

Dr. Armando C. Lobato, who developed the technique, has successfully used it on 34 patients, including 7 patients who required bilateral repairs, he said at the meeting, sponsored by the Society of Interventional Radiology.

Dr. Lobato performed his first trifurcation procedure – which he also calls the Brazilian Sandwich procedure – in August 2008.

He reported having 100% technical success using the procedure, with no operative deaths and no need to convert to an open procedure.

During a median follow-up of 5 months (range, 2-24 months), no patient experienced colonic or buttock necrosis, no patient had ischemic colitis, and there were no type III endoleaks.

In all, 39 (95%) of the 41 treated internal iliac (hypogastric) arteries maintained primary patency. As a result of the procedure, occlusions also occurred in

one contralateral iliac limb and in one ipsilateral external iliac artery. Secondary patency was maintained in 38 of the 41 treated arteries and their associated vessels, said Dr. Lobato, medical director of the Vascular and Endovascular Surgery Institute in São Paulo, Brazil.

About 20%-30% of patients with abdominal aortic aneurysm also have aneurysms in one or both of their common iliac arteries. Endovascular repair in these patients is harder because of the difficulty in finding an adequate landing zone for the stent-graft limbs and because the iliac aneurysm is a potential site for an endoleak.

In addition, some patients have short common iliac arteries, an anatomy that is especially prevalent in patients of Asian descent and on the right side of the body.

Dr. Lobato said that he developed the trifurcation technique to overcome these anatomical problems so that endovascular aneurysm repair could expand in a safe and cost-effective way via a method that was easy to perform.

Dr. Lobato broke the trifurcation technique into the following five steps:

► First, he inserts the main, bifurcated stent graft using an ipsilateral femoral approach. He positions the graft so that the distal end of the iliac limb is 1 cm above the origin of the internal iliac artery.

VITALS

**Major Finding:** A novel trifurcation technique safely preserved flow through the internal iliac arteries in patients who underwent an endovascular abdominal aortic aneurysm repair with an aneurysm in one or both common iliac arteries.

**Data Source:** A single-center series of 34 patients.

**Disclosures:** Dr. Lobato said that he had no disclosures.

► Second, he inserts a long, 5-Fr multipurpose catheter into the ipsilateral internal iliac artery using left brachial access and a 0.035-inch, extra-stiff guide wire with a floppy tip.

► In the third step, he places a covered, self-expanding stent 2 cm into the internal iliac artery with a 6-cm overlap into the iliac limb. He also then positions an iliac limb extension 1 cm below the proximal end of the covered stent. He deploys the iliac limb extension first, followed by deployment of the covered stent.

► Fourth, he models the iliac limb stents with a latex balloon and dilates the covered stent with an angioplasty balloon.

► For the final, fifth step, he deploys the graft within the contralateral iliac limb.

In patients with bilateral aneurysms in their common iliac artery, he repeats steps 2-4 on the second side. ■



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DR. LOBATO