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CLINICAL AND RESEARCH UPDATES FROM ***THE UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE*** AND ***THE UNIVERSITY OF MARYLAND MEDICAL CENTER***

NOVEL ROBOTIC CORONARY BYPASS SURGERY SETS UMMC APART

Splitting open a patient's chest wall and stopping the heart — part of well-established traditional coronary artery bypass surgery — are avoided in a novel robotic-assisted surgical approach used at University of Maryland Medical Center (UMMC), dramatically reducing the traumatic impact of the surgery and speeding recovery.

Known as minimally invasive direct coronary artery bypass (MIDCAB) surgery, the procedure restores sufficient cardiac blood flow by grafting portions of the mammary arteries to the heart

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KEY POINTS:

- More than 60 MIDCAB (minimally invasive direct coronary artery bypass) surgeries performed at UMMC since Dr. Bradley Taylor's arrival in 2013
- 11% of UMMC coronary bypass patients offered MIDCAB approach vs. 1% nationwide
- Minimally invasive technique avoids splitting chest open, using heart-lung machine
- Complications of MIDCAB surgery minimal and recovery quicker
- Hybrid revascularization combines MIDCAB with angioplasty for patients with multiple blockages

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vessel using three pencil-sized incisions between the ribs. This robotic technique has been performed on more than 60 UMMC patients since Associate Professor of Surgery Bradley Taylor, M.D., M.P.H., joined the faculty in November 2013 after leaving a busy private practice in Pennsylvania.

In the United States, less than 1% of patients requiring coronary artery bypass grafts are offered MIDCAB surgery, he explains, but that number jumps to 11% among UMMC patients because of the state-of-the-art robotic equipment available here and more advanced training among staff members.

"This procedure is uncommonly performed outside of the University of Maryland, which offers an environment to provide more innovative care than in a community setting," says Dr. Taylor, who began performing MIDCABs during his surgical training more than a decade ago. "Coming here gave me the opportunity to grow my experience on a greater scale."

BRADLEY TAYLOR, M.D., M.P.H.; performs minimally invasive direct coronary artery bypass surgeries at UMMC.

Less Traumatic Approach

Regardless of the surgical approach to coronary artery bypass, the goal is the same: to graft new blood vessels into place that bypass clogged arteries, ensuring sufficient blood flow to the heart. But traditional open-heart bypass surgery, used for decades, reaches the heart by cutting open the chest and dividing the sternum through a 10- to 12-inch incision. Additionally, the heart must be stopped to perform the surgery, requiring the patient to be placed on a cardiopulmonary bypass machine to support heart and lung function.

MIDCAB surgery avoids this more traumatic, complicated technique. Mammary arteries for the bypass are harvested with robotic tools through small incisions in the chest and are then sutured to the clogged heart vessel through a 2-inch incision in the ribcage. In MIDCABs where only the left anterior descending (LAD) artery is being bypassed, the surgery can often be done without placing the patient on a heart-lung machine — known as "off-pump" MIDCAB.

"The MIDCAB procedure avoids sternotomy, so it avoids a big incision," Dr. Taylor explains while recounting its numerous benefits. "Fewer patients require a blood transfusion, they generally have less pain, and it may offer faster and easier recovery and rehabilitation. Plus, there's a long-term benefit to the LAD artery, with increased long-term survival and less need for cardiac re-interventions over time."

Complications Minimal

Fast, safe and effective, the minimally invasive approach is typically chosen for patients at extremes, Dr. Taylor says — either those young and otherwise healthy or those too elderly and sick to withstand more extensive surgery.

"For the most part, we've had very high patient satisfaction," he notes. "A lot of these patients seek a MIDCAB for themselves because they don't want to undergo a bigger operation. And a lot of the patients we see are really old with bad lungs or Parkinson's disease, and we can sneak them through with this operation."

Dr. Taylor says that "only" 11% of patients at UMMC can have this type of operation — although the medical center's volume is much greater than nationwide — because the other 89% have such extensive coronary artery disease that surgeons need to be able to access multiple areas on the heart that can't be reached robotically.

Complications of MIDCAB surgery are typically minimal, Dr. Taylor notes, especially when compared to those of traditional bypass surgery. Usually, MIDCAB patients can go home a day or two earlier from the hospital than those having traditional bypass — in three to five days — and can return to work in two to three weeks.

"The risk of stroke is lower because we're not clamping the aorta," he says. "Plus, because patients aren't put on a bypass machine, there are clear advantages. With the open bypass, risks of bleeding, renal failure and stroke are higher."

EMERGING PROCEDURE AUGMENTS BENEFITS

Future technological advances will hopefully expand the number of coronary bypass patients eligible for MIDCAB surgery, but another cutting-edge technique is already emerging to fill the void. Known as hybrid revascularization surgery, it combines the minimally invasive robotic bypass operation on the LAD artery with noninvasive angioplasty and stenting of one or more other coronary arteries.

Hybrid revascularization surgery is typically performed in two stages because eligible patients require angioplasty for narrowed coronary arteries but also have a LAD artery that has become so blocked that widening it with angioplasty is not possible. Within days after undergoing MIDCAB surgery on the LAD artery, the patient then undergoes angioplasty on the other occluded arteries.

Dr. Taylor, who also serves as director of coronary revascularization at UMMC, has partnered with UMMC physicians David A. Zimrin, M.D.; Anuj Gupta, M.D.; and Mark R. Vesely, M.D.; among others, to perform hybrid revascularization surgery on about 15 UMMC patients as of June 2013. About 10% to 15% of MIDCAB patients benefit from this hybrid approach, "the area with the greatest growth," Dr. Taylor says.

The hybrid technique could eventually replace the need for traditional open-heart bypass surgery on a more widespread basis, Dr. Taylor says, but that shift will require a change in attitude among medical professionals beyond UMMC.

"People get into a pattern of thinking, and making this change is a matter of looking at these patients ... and creating a better collaborative approach," he says. "We're coming from the era where everyone was undergoing open surgery with vein grafts, but we've seen that using the mammary artery is highly successful, with 95% of such grafts remaining open 10 years later. It's a matter of changing everyone's mindset, including cardiologists and referring doctors." ✚

To reach the division of cardiac surgery, please call **410-328-5842**.

ROUNDING OUT CARE AND RESEARCH

UMMC MIDTOWN CAMPUS IS THE ONLY CENTER OF EXCELLENCE FOR LOU GEHRIG'S DISEASE IN MARYLAND

The ALS Association recently named the University of Maryland Medical Center Midtown Campus' ALS Center a Certified Treatment Center of Excellence — the only one with this designation in the state of Maryland. This certification is based on professionals' skill sets, number of people living with ALS served, active involvement in ALS-related research, relationships with local ALS chapters and access to care. The ALSA Center of Excellence recognition certifies that the UMMC Midtown Campus ALS Center offers comprehensive, multidisciplinary, evidence-based care that has produced positive outcomes for patients.

EPILEPSY PROGRAM EARNS NATIONAL DESIGNATION

UMMC's program in epilepsy recently earned a renewed designation from the National Association of Epilepsy Centers (NAEC) as a Level 4 center. This distinction is achieved only by those centers offering the most complex forms of intensive neurodiagnostic monitoring along with extensive surgical, medical, neuropsychological and psychosocial treatment. UMMC's Epilepsy Center has long held the Level 4 designation, first achieving the honor shortly after the NAEC was founded in 1987. The Epilepsy Center's Level 4 designation acknowledges the extensive array of treatments currently available at UMMC including surgery and vagal nerve stimulators. A newly FDA-approved

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