

Same Destination, Different Route

To Inspect the Heart, Some Doctors Now Start at the Wrist

By SANDRA G. BOODMAN
Special to The Washington Post

David Longnecker lay on a table in the cardiac catheterization lab of George Washington University Hospital, steeling himself for a procedure that would reveal the cause of the bout of crushing chest pain that had triggered the ambulance trip from his Dupont Circle office. Doctors had ruled out a heart attack and ordered an angiogram to check for blockages in his coronary arteries. If one was found, he would undergo angioplasty, which involves placement of a metal stent to prop open the artery.

Shortly before the procedure, Ramesh Mazhari, the interventional cardiologist assigned to Longnecker's case, asked an unexpected question. Instead of the usual approach, in which a catheter is inserted in the groin and threaded up the large femoral artery, would Longnecker agree to Mazhari's preferred method: accessing the heart through the smaller radial artery on the underside of the wrist?

"I said, 'If you're confident doing it, fine,'" recalled Longnecker, 70, former chairman of anesthesiology and critical care at the University of Pennsylvania. A member of the Institute of Medicine and a director of the Association of American Medical Colleges, Longnecker said he had never seen catheterization performed in this manner, and few of his physician friends who are not cardiologists had heard of it.

That is likely to change. A small but growing cadre of cardiac specialists, among them Mazhari, are embracing the newer approach, convinced it is more comfortable and safer for many patients than femoral access, the standard for more than three decades. Some recent studies have found the approach has a lower rate of complications, including severe bleeding, than femoral procedures.

Only 1 percent of the 1.2 million cardiac catheterizations performed annually in the United States are done through the wrist; the newer approach is often preferred for patients who are extremely obese or have poor leg circulation. But in Europe, Canada and Japan, about 50 percent of catheterizations are performed using the technique devised in the early 1990s. The approach allows patients to sit up immediately afterward and even walk, an impossibility in femoral procedures, which require that they lie flat on their backs for several hours to prevent severe bleeding.

Because patients tend to recover faster, Mazhari said, she discharges some patients the same day, avoiding an expensive overnight hospital stay.

Questions about the best method of performing cardiac catheterizations, one of the most common procedures in medicine and

among the most profitable for hospitals — Medicare reimburses GWU about \$10,600 for an angioplasty involving one stent — reflect some of the issues in the roiling health-care debate. Is the radial approach, which has a steep learning curve, actually superior or largely a fad? Can it cut costs by reducing hospital stays? And if patients are given a choice of catheterization sites, what factors should they consider?

"I think there is a reluctance among physicians who are used to doing procedures a certain way" to change, said Mazhari, who learned to do the procedure last year and uses it about 80 percent of the time.

She and others say they know of no other physician in the Washington area who favors the radial approach.

In Boston, a city brimming with teaching hospitals and interventional cardiologists — heart specialists with advanced training who perform procedures — only a handful of physicians specialize in radial catheterization, said Pinak B. Shah, director of interventional cardiology training at Brigham and Women's Hospital.

"There's no data out there to suggest it is worse and growing evidence that it may be better," said Shah, an assistant professor of medicine at Harvard Medical School, who performs 60 to 70 percent of procedures through the wrist.

Shah said he believes a combination of financial self-interest, the relative paucity of medical devices designed for radial access, resistance by older physicians and the general tendency of doctors to regard patient discomfort as secondary have contributed to under-use of the approach.

Some senior interventional cardiologists say they worry that the method may be hyped.

"I think it's a good procedure in the right hands for the right reasons," said Bryan Raybuck, director of the cardiac catheterization lab at the Inova Heart and Vascular Institute in Fairfax. Raybuck, who learned to perform the procedure in Quebec 12 years ago, estimates he uses it fewer than two dozen times

annually, and only when circumstances require it.

"There's a lot of buzz about this right now," he said of radial procedures, which account for about 150 of the 8,000 cardiac catheteriza-

tions done at his hospital annually. "I don't think it's worth going across the river to do it. It's not *that* good."

William O. Suddath, an interventional cardiologist at Washington Hospital Center, home to the area's busiest cardiac catheterization lab, said doctors there also prefer the femoral approach, which has benefited from improvements in devices used to stop bleeding. "There's an inherent conservatism in medicine for many reasons," he said.

Suddath said he is concerned about the "tremendous amount of competition going on in centers around the country." And he worries that radial procedures are being used as a "marketing ploy" by some hospitals "to lure patients to particular cath labs."

A Challenging Procedure

Shah is familiar with such skepticism. "I think the people who pooh-poo it don't spend the time learning how to do it," said Shah, who has performed more than 250 radial procedures in the two years since he trained to do them in Canada.

In the cath lab, he noted, "time is money" and radial procedures are "among the most challenging things we do." Until doctors achieve proficiency, they can be agonizingly slow;

the fee remains the same, whether a case takes 30 minutes or five hours. Shah said it took him 50 cases "before a lot of the butterflies in my stomach had flown away." Some doctors say it takes 100 cases to achieve true proficiency.

One reason for the greater difficulty is anatomical. The femoral artery, approximately the width of a pinkie, presents a direct route to the heart; to a physician, it's a straight stretch of freeway that can be navigated easily. The radial artery is thinner and offers a much more circuitous path, more like driving on a two-lane mountain road with frequent switchbacks.

"You have to be very patient and very meticulous," Mazhari said.

Severe bleeding is a feared complication in femoral procedures; the risk of a major complication is 1 to 3 percent. Arterial spasms top the list of radial complications. They are

most common, Shah said, in "little old ladies," who tend to have small arteries that can clamp shut. "There are some horror stories about that,"

he said.

Shah and Mazhari say that their patients, many of whom have undergone both kinds of catheterizations, much prefer the wrist approach.

"We've got a lot of repeat customers, unfortunately," Shah said. Lying flat and motionless for two to six hours while recovering, he said, can be hard for patients with bad backs, and many older men find it difficult to urinate in this position.

William Sanford, who underwent angioplasty in April, was thrilled not to be among them.

"I could get right up and go to the bathroom," said Sanford, 64, who lives in Silver Spring and was taken by ambulance to GWU after suffering chest pain while working the night shift as a maintenance supervisor in the Capitol. "I was so surprised at how easy it was and how comfortable it was."

A Clear Difference

Two recent studies that compared the approaches found a lower rate of serious complications among patients undergoing radial procedures.

A report in the August 2008 Journal of the American College of Cardiology: Cardiovascular Interventions compared outcome data for more than 593,000 procedures — 7,800 of them radial — performed between 2004 and 2007 at 606 hospitals.

Led by Sunil V. Rao at the Duke Clinical Research Institute, the authors found that outcomes were similar but that bleeding complications were 58 percent lower in the wrist group. The reduction was most pronounced among high-risk patients, including women and those over 75.

"These data support the efficiency and safety [of radial surgery]... and suggest that wider application of the radial approach may enhance the safety of coronary intervention," the researchers concluded.

In the January issue of American Heart Journal, a meta-analysis of 28 years of studies, some of them conducted in Europe and Canada, found a 73 percent reduction in bleeding and shorter hospital stays among radial patients.

Longnecker, who lives in Annapolis, said that for him, the benefit is clear.

Four years ago he underwent a spinal procedure that was performed through the femoral artery. "Afterward I had to lie flat for eight



hours with five- or six-pound sandbags on the site" to prevent bleeding, he recalled. His groin was black and blue for two weeks.

After his radial angioplasty, he was allowed to sit up immediately and walk. A clear wristband equipped with a small inflatable balloon was affixed to his wrist to close

the artery. It was removed after about eight hours and replaced by a simple bandage.

"It was remarkably more comfortable and less constraining," Longnecker said. "All that remained the next day was a little red dot. My wrist felt fine. I could have played tennis."

"If somebody offered me the option of having a procedure radially or femorally," Longnecker said, "I would make the decision before their sentence was finished."

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Radial Catheterization

Inserting a catheter through the radial artery in the arm appears to be linked to a lower rate of bleeding complications than the standard route through the groin.

1 The doctor punctures the **radial artery** on the wrist with a syringe and inserts a **guide sheath**.

2 The catheter is then threaded into the artery via the sheath. The doctor slowly pushes the catheter

up the radial artery as it becomes the **brachial artery** and then the **axillary artery**. The catheter stops at the **ascending aorta**, just above the **heart**.

3 Diagnosis and procedures, if necessary, are performed. The

doctor can inject contrast dye to visualize blockages in heart vessels.

4 The catheter and sheath are removed and a pressurized wristband is placed on the wrist entry site to stop bleeding.



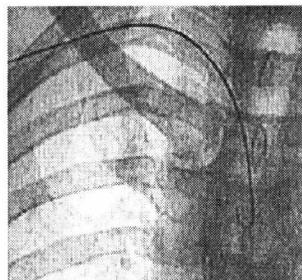
BY EYI MAGES FOR THE WASHINGTON POST

Ramesh Mazhari, an interventional cardiologist at George Washington University Hospital, performs 80 percent of catheterizations through the wrist.

ONLINE

See what the cardiologist sees.

Watch an X-ray video of a cardiac catheterization performed through a radial artery at www.washingtonpost.com/health.



Wristband applied when radial catheter is removed.

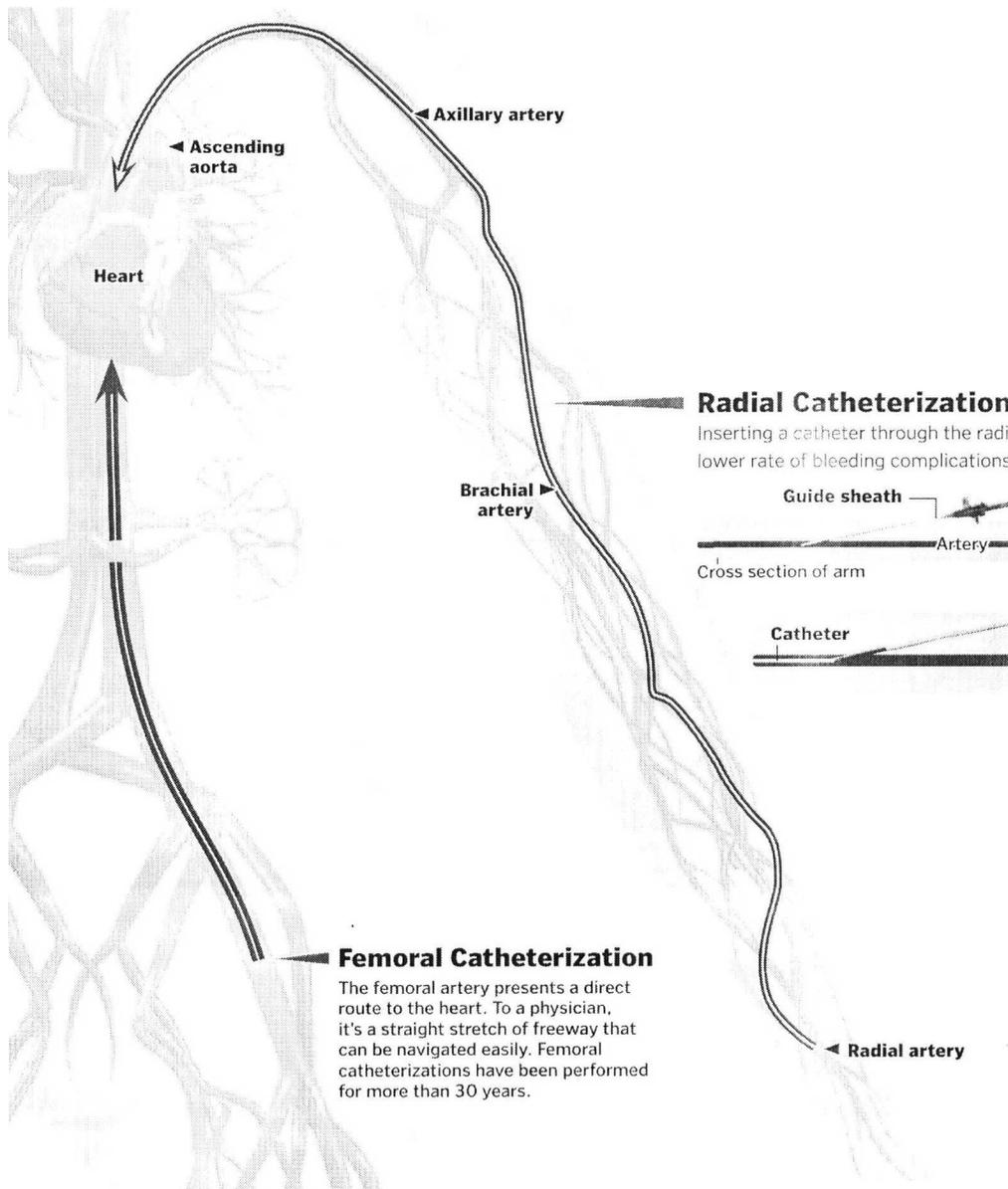
MAIN TOOLS OF RADIAL PROCEDURE

Sheath: A device that creates an entry into the artery on the underside of the wrist.

Catheter: Flexible tubing, about three feet long, inserted into blood vessels, through which doctors can diagnose and treat cardiovascular problems.

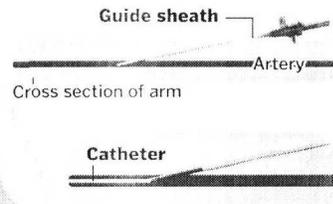
Wristband: Worn over the puncture wound after the catheter is removed. The wristband keeps pressure on the entry point, preventing bleeding. Pressure on the site is slowly lowered via a syringe over several hours.

CARDIOVASCULAR ILLUSTRATION BY BIGSTOCKPHOTO; GRAPHIC BY BILL WEBSTER — THE WASHINGTON POST



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Femoral Catheterization

The femoral artery presents a direct route to the heart. To a physician, it's a straight stretch of freeway that can be navigated easily. Femoral catheterizations have been performed for more than 30 years.



BY MICHAEL TEMICHINE FOR THE WASHINGTON POST

"It was remarkably more comfortable and less constraining."

David Longnecker,
who preferred his radial catheterization to a femoral procedure