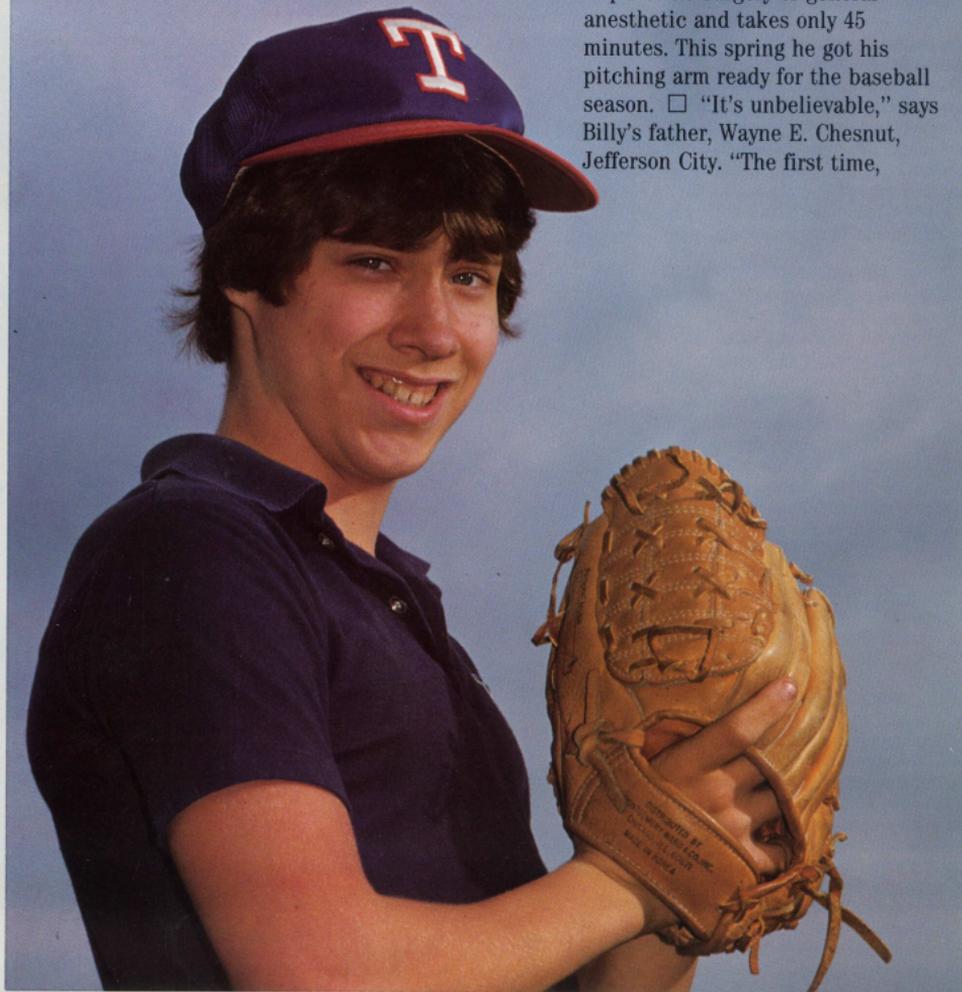


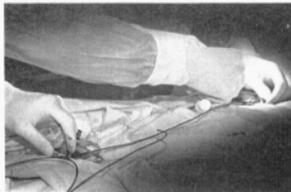
Balloon 'Surgery' for Young Hearts

By Nancy O'Brien

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Billy Chesnut, 13, already had open-heart surgery once, 10 years ago. Now, the boy, who has chest pains and can't play in sports because he faints, is afraid he will die. □ The doctor says his aortic valve needs to be opened again. He performs a new procedure on Billy that requires no surgery or general anesthetic and takes only 45 minutes. This spring he got his pitching arm ready for the baseball season. □ "It's unbelievable," says Billy's father, Wayne E. Chesnut, Jefferson City. "The first time,





Starting in a patient's leg, Lababidi threads a wire through an artery into the heart. He will guide the balloon catheter along this wire.

Billy was in the hospital for three weeks. This time when his heart valve was opened, he was in only three days," thanks to balloon aortic valvuloplasty, a procedure developed by his doctor, a professor of pediatric cardiology at UMC's School of Medicine.

"We have all the faith in the world in that man. He is something," says Chesnut.

"That man" is Dr. Zuhdi Lababidi, whose balloon procedure is used to correct valvular aortic stenosis, the extreme narrowing of the aortic valve. Lababidi is the only physician in the world to have performed this procedure and opened aortic valves without surgery.

"People with aortic stenosis usually require two heart operations, one during childhood to open the valve and a second when they are about 50 years

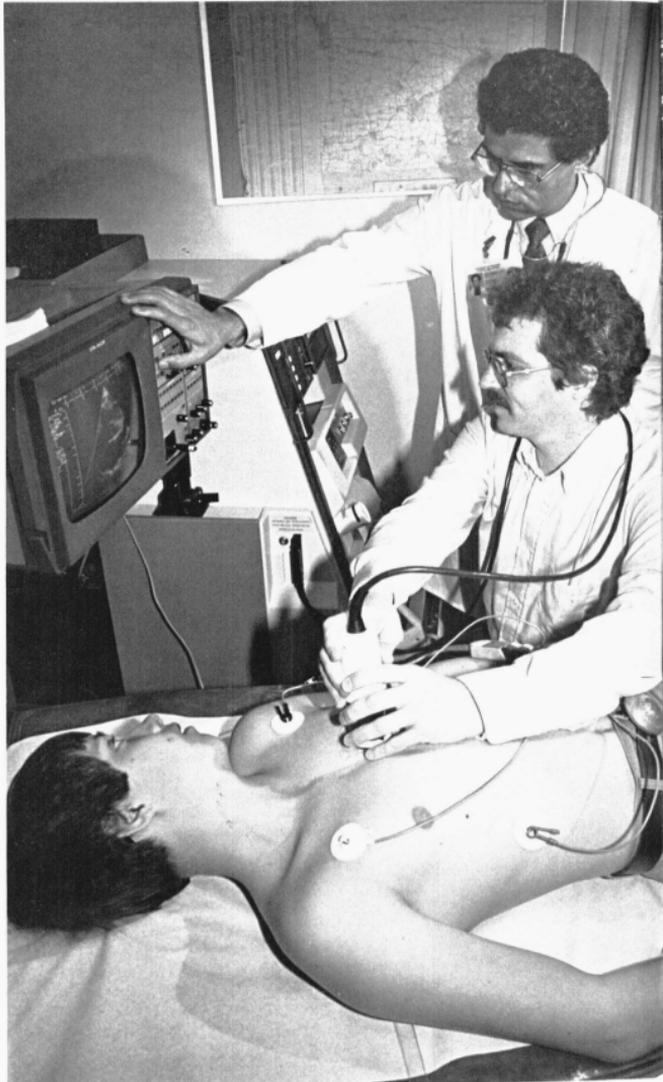
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old to replace the defective valve," Lababidi says.

"This system eliminates the need for surgery during childhood," he says.

His technique is a simple modification of a balloon catheterization procedure developed by Dr. Andreas R. Gruntzig in 1977 in Switzerland to enlarge narrow coronary arteries.

Balloon catheterization begins with inserting a needle into a blood vessel in the leg. Then, a flexible wire is threaded through the needle and into



Lababidi, top, and technician Daniel Mayfield use echocardiography to check Billy Chesnut's aortic valve once a year. Lababidi stretched open the defective valve with a balloon catheter—a new, non-surgical technique he pioneered that saves lives while avoiding the risk and expense of open-heart surgery. Lababidi inflates the balloon for five seconds at a time with pressure three to four times greater than the air pressure in a car tire.



The only doctor so far to perform balloon valvuloplasty, Lababidi monitors his progress with X-rays during the procedure.

the heart. The doctor passes a narrow catheter, equipped with an inflatable balloon, over the wire. The balloon is inflated with increasing pressure to dilate the narrow arteries or the fused cusps of the defective valve.

"The balloon stretches and opens the valve like a surgeon with a knife opens a heart valve during open-heart surgery," Lababidi says.

Until now doctors have not been able to use the balloon catheterization technique to open the aortic valve because pressure behind this valve is so high, Lababidi says.

In a normal heart, pressure on the left side is about five times the pressure on the right side. In patients with aortic stenosis, the left chamber pressure even may double.

To further complicate matters, once the balloon is in place and inflated, the aortic valve is completely blocked, and since the heart continues to pump, blood backs up in the lower-left chamber, threatening arrhythmia.

"The heart can stop beating altogether," Lababidi says.

So he devised a system to keep the blood moving out of the heart's lower-left chamber. His new technique uses two catheters instead of one.

He threads the balloon catheter, equipped with a channel for air and a channel for blood, through an artery in the leg, through the aortic valve and into the lower-left chamber of the heart.

The second catheter is threaded through a vein in the leg and into the upper-right chamber of the heart. Lababidi joins the two catheters outside the body.

When the balloon is inflated and blocks the aortic valve, blood can flow through the catheter loop outside the

body from one heart chamber to the other, preventing blood pressure buildup.

Lababidi says his technique beats traditional open-heart surgery in several ways:

1) It's less expensive. Open-heart surgery can cost between \$20,000 and \$30,000; valvuloplasty costs less than \$2,000.

2) Recovery time is decreased. Following balloon catheterization, the child may go home the next day and return to school instead of spending two weeks in the hospital and four weeks at home recuperating.

3) While open-heart surgery carries a 10 percent risk of death, the risk with valvuloplasty is only one in 1,000.

4) Lababidi's procedure does not require a blood transfusion.

5) Results can be checked right away instead of waiting for the patient's recovery as with open-heart surgery.

6) Catheterization leaves no chest scars since the whole procedure is done through two needle holes in the leg.

7) While open-heart surgery lasts about four hours, Lababidi's procedure takes less than 45 minutes and doesn't require a general anesthetic, just a mild sedative.

Lababidi points out that balloon catheterization may not be a long-term solution for every patient. "Some children may eventually need artificial heart valves."

But the technique gives children a chance to grow to an age when surgical repair is less risky and does not result in adhesions that may complicate future valve replacement.

Lababidi says the procedure is also of benefit in borderline aortic stenosis, which is often a dilemma for the pediatric cardiologist.

"Balloon surgery has made a world of difference in Billy," Chesnut says. "Before, he couldn't play any sports; he had chest pains and he fainted."

"His grades fell and he missed 28 days of school during the year before his valvuloplasty. He even told Dr. Lababidi, 'Why should I try? I am going to die anyway.'"

"Now he's on the go all the time. He's into dirt biking, and next year he will be on the freshman basketball team. He is hardly ever in the house. His color is a lot better, and he eats like a horse."

In addition to praise from parents, Lababidi is gaining the attention of his colleagues. Doctors from Arizona, South Carolina, New Jersey, Illinois, Kansas, Iowa, Arkansas and Oklahoma have referred patients to him.

He has been invited to visit cardiologists in San Antonio, Texas; Brooklyn, N.Y.; Sacramento, Calif.; Peoria, Ill.; and Los Angeles to instruct them in the use of balloon aortic valvuloplasty.

The most difficult part of the procedure is speedy manipulation of stopcocks and mechanisms. "You can't take more than 10 seconds to inflate and deflate the balloon because the inflated balloon obstructs blood flowing to the brain," he explains.

Studying civil engineering for three years in college helped him develop the technique. "Cardiology involves a lot of hydraulics," he says. And the doctor likes to build things. "I'm a handyman. I like gadgetry."

Billy's dad: "Now he's on the go all the time....He eats like a horse."

Currently, Lababidi is working with the balloon catheter manufacturer to produce bigger, tougher balloons that can withstand more pressure. He also is asking the company to reduce the sharpness of the catheter tip and to enlarge the catheter opening at the tip of the balloon so more blood can flow through.

To date, Lababidi has performed his procedure 127 times, on children ranging from 1 to 16 years old.

In addition to conducting balloon valvuloplasty at the medical school, he regularly visits clinics and sees children in Joplin, Springfield, Rolla and Hannibal.

"Usually after infants with defective valves start walking, they begin showing such symptoms as chest pain, dizzy spells, shortness of breath and the worst complication, sudden death during exercise," Lababidi says.

But thanks to his new system, children such as Billy Chesnut can have their aortic valves opened without resorting to open-heart surgery. □