BroadcastMed | Transcatheter Pulmonary Valve Replacement

[BEEPING] There's about 4,000 babies born every year that have some sort of obstructed problem with the way the blood flows from the right ventricle to the lungs.

And those babies could have what most people have heard of-- tetralogy of Fallot, they can be double outlet right ventricle, pulmonary valve stenosis, heterotaxy, or more complex types of congenital heart disease.

But it's usually some form of congenital heart defect that causes a problem with the way the blood needs to get from the right ventricle to the lungs.

And many of them may have an operation as a baby or as a young child, and may be coming back because they need to have that revised.

And that's the perfect time for me to be able to prevent them from having an operation and be able to revise their right ventricular outflow tract with the transcatheter pulmonary valve.

So transcatheter pulmonary valve is similar to transcatheter aortic valve.

It involves a different patient population.

It is predominantly in patients with congenital heart disease or post-operative problems with the right ventricular outflow tract.

It is different than transcatheter aortic valve in that is a very different procedure to perform.

You come from the vein.

You have to go through the right heart.

The angles are very different than the aortic angles.

Often the graft is very narrow or quite wide, and so you may have to put a stent or some other product in, like a covered stent, before you can actually put the transcatheter valve in.

So it's a very different procedure than transcatheter aortic valve, but it's similar technology.

The valves that we have available for transcatheter aortic are also available for transcatheter pulmonic.

So transcatheter pulmonary valve has revolutionized care for patients that have this problem.

They are born with the problem with the way the blood flows to the lungs.

The right ventricle's obstructed.

It could be below the valve.

It could involve the valve.

It could be above the valve, or all the above.

But they can't get blood appropriately from the right ventricle to their lungs.

And most of them, before transcatheter pulmonary valve was available, needed to have, on average, about three operations before they made it to college.

And that's a lot of having your chest open, a lot of recovery, a lot of trauma through recovery of a surgical procedure.

Going back through the incision involves going through scar tissue, and it puts the patient at higher risk each time they have the subsequent operation.

And so being able to take someone who has had a surgery as a child and be able to offer them something that they do not need to go back the operating room, they do not need an incision.

We can go through the blood vessel.

They can come in and have the valve put in and go home the next morning.

Within three days, they can be doing their normal activities without really much more difficult recovery.

It's revolutionized the care for that patient population.

So transcatheter pulmonary valve is a endovascular procedure.

It's done in a cardiac catheterization laboratory.

It can be done in a hybrid lab, but it doesn't necessarily need to be done in a hybrid lab.

It can be done in a single plane, but it's preferable to do it in a biplane, because the lateral projection is very important.

So usually, it's a transcatheter procedure in a standard catheterization laboratory with biplane.

And using the two radiographic planes, we're able to see the outflow tract, measure the outflow tract, decide which valve we want to put in.

We start from the vein, and usually in the leg, but we can also come from the neck or other places.

The catheter comes into the right ventricle and goes out into the lungs.

We use a super stiff wire that allows us to then move the valve over the wire into the right ventricular outflow tract, and we can deploy the valve.

In the very beginning of doing this, we often put stents in first to hold the outflow tract open.

But with the newer stent technology with the valves, we're not seeing any need to really do that anymore, which makes the procedure even faster and more seamless.

So transcatheter pulmonary valve is something that I've been involved in for really more than a decade.

The valve became available through really hard work and a lot of effort by physicians like myself that perform procedures on congenital heart patients.

Congenital heart patients is a smaller patient population.

The aortic valve is much more money for the company, because it's a big patient population.

So there's a lot of drive to develop that technology.

But developing technology in a small patient population like congenital heart disease is not necessarily as attractive to a company who needs to be able to make income off of the product that they're building.

So we took the transcatheter aortic valve that was already looking like an excellent valve and moving in the direction of approval for a transcatheter aortic procedures, and we got the company to allow us to study it in congenital heart disease.

Same exact valve, slightly different delivery system to be able to go the angles that we needed.

We took that valve and did a feasibility study.

In about 2006 to 2008, we were able to show that the valve worked extremely well in the pulmonic.

So it went into a multi-center trial.

And I've been involved in the development of that technology from the very beginning.

So today, the valve that we use every day in multiple labs all across the Southeast for transcatheter aortic valve is a similar valve that we use for transcatheter pulmonic.

But the procedure is exceedingly different and more complex, and usually falls in the hands of someone that is very skilled and knowledgeable about congenital heart disease.

So transcatheter pulmonary valve is something that we offer at Medical University of South Carolina.

There are two valves currently approved by the FDA, the Melody valve and the Sapien valve.

Both of those valves are being used routinely here to revise right ventricular outflow tracts for patients with congenital heart disease, to revise right ventricular outflow tracts for adults that have had a Ross operation and now need their homograft repaired.

And we are able to really help children and adults with this problem to prevent them from needing another operation, or sometimes, their first operation.

In a native outflow tract, we're able to do that as well.

The most satisfying thing about transcatheter pulmonary valve is that this is amazing technology.

We are putting in a new valve in someone's heart without opening their chest.

That patient, for generations, has had to have an operation to get that valve put in, and go through the recovery of that operation, and all of the risks of that operation.

Today, we can take that patient, bring them to the cath lab, go through just a blood vessel in their leg, put the new valve in, not have any stitches, not have any recovery other than three days to allow the leg to heal, and they're back to doing whatever they want to do.

They can go to Disney World with their grandchildren.

They can run around and ride their bike if it's a child.

They can do anything they want to do very quickly without a lot of recovery, and with an excellent result.