

ELIZABETH STEPHENS: My name is Elizabeth Stephens, and I'm a Pediatric and Congenital Cardiac Surgeon at Mayo Clinic. Today, I'll be talking about transposition of the great arteries and the Arterial Switch Operation. Transposition occurs when the great vessels coming off the heart are reversed, or transposed.

On the left is normal anatomy with the blue blood going through the pulmonary artery to the lungs and the red blood going through the aorta to the body. On the right is transposition, where the pulmonary artery and the aorta have reversed. You can see the blue blood is going through the aorta to the body.

The surgery performed to correct this is called the Arterial Switch Operation in which we basically switch the great arteries coming off the heart, as shown here with the suture line showing the pulmonary arteries in blue, now in front of the aorta in red, with the red blood now going to the body.

Here we are opening the pericardium, or lining around the heart. And you can appreciate the anatomy, as you can see the aorta, which is where we're working, which is usually behind the pulmonary arteries, is now in front. And here, we're dissecting out the pulmonary arteries behind the aorta.

Now, the heart is stopped. We're opening up the aorta. The first step is to take the coronary arteries off of the aorta. So here, we're working on the right coronary artery, and we're taking it off the aorta as a button. These need to be mobilized so that they can be attached to their new location without any tension.

Now, we're taking the left coronary artery off the aorta. We are now opening the pulmonary artery. And here, we're making an incision for where the right coronary artery will be sewn in. We are checking to make sure the coronary can be attached without any tension.

And here, we're suturing in the right coronary artery into its new location into the neo-aortic root. Here, we're making the incision for where the left coronary artery will be, making sure there's no tension. And now, we're suturing in the left coronary artery into its new location in the neo-aortic root.

Now that the coronary arteries are sewn into the neo-aortic root, that's attached to the remaining portion of the aorta such that red blood can now go back to the body. And here, we're suturing the front side of that anastomosis. Now, we are patching the holes where we cut out those coronary arteries. This will be the new, or neo-pulmonary root.

We're now inside the heart and closing the atrial septum. This is a hole that is usually created in the baby first day of life to allow the blood to mix. And now, the heart is beating again, and the new, or neo-pulmonary root is being attached to the pulmonary arteries, which, again, you see are now in front. And here, you can see the final repair. I hope you found this video informative.