Surgeons Place Pacemaker In 15-Minute-Old Newborn

Marcus Wohlsen, AP
The name Jaya in Hindi means victorious. And little Jaya Maharaj was just that, when she became one of the smallest recipients of a pacemaker when she was just 15 minutes old. A team of doctors at Stanford University's Lucile Packard Children's Hospital determined the girl born nine weeks premature had only hours to live if they did not perform the surgery. Jaya, who was diagnosed in the womb with a severe heart ailment, entered the world with a heart rate of 45 beats per minute. A healthy newborn heartbeat is 120 to 150 beats per minute.
"The only way to save this baby was to deliver the baby right away and then the pacemaker," said Dr. Katsuhide Maeda, the surgeon whose steady hand stitched the pacemaker's electrical leads to Jaya's walnut-sized heart. Stanford announced details of the operation this week. During a routine prenatal visit, doctors told Leanne Maharaj, 26, and Kamneel Maharaj, 31, that their first child's heart rate was dangerously low. They learned that their daughter suffered from congenital heart block, in which the mother's immune system mistakenly attacks the nerve fibers that cause the fetus' heart to beat.

The prognosis was grim. Doctors would have to induce labor and force the baby to be born as early as possible to correct the ailment before her heart failed. Jaya grew and gained weight as her parents waited, giving them hope. "We were worried, but at the same time we were hopeful that she was fighting inside and doing the best she can," said Kamneel Maharaj, an information technology manager in Silicon Valley.

Dr. Valerie Chock, the neonatologist who counseled the couple, said determining when the baby should be born involves a delicate set of calculations. The baby should be delivered as soon as possible while still allowing her to gestate so her organs develop enough to support life outside the womb. "Unfortunately, a lot of babies in this position don't even survive childbirth," Chock said.

The doctors settled on 31 weeks as the delivery date. A team of about 20 assembled to handle the complex procedure in which both speed and caution were essential. The delivery of the 3.5-pound baby went smoothly, but Jaya's heart was beating so slowly that surgeon Maeda decided to open her chest immediately to perform the operation. Typically in such cases, a surgeon would connect wires attached to a pacemaker outside the body then perform a second surgery weeks later to install a permanent device. Maeda decided to tackle the more difficult challenge of inserting the permanent pacemaker immediately to avoid the second surgery. The whole process took about an hour.

The current pacemaker should last Jaya about 10 years, Maeda said.

Dr. Michael Artman, the chief pediatrician at Children's Mercy Hospital in Kansas City, and a neonatal cardiologist not connected to the Stanford operation, described the surgery as an impressive accomplishment that could encourage other children's hospitals to undertake similar efforts.

"What really distinguishes this is just the fragility of this premature baby and the condition in which this baby was born," Artman said. He said that while inserting a pacemaker is not itself the most technically challenging kind of surgery, the coordination of the large team needed to pull off the entire procedure poses a major challenge. Today, at a little less than three months old, Jaya weighs more than eight pounds and is thriving.

"Whenever we were worried, she would kick from inside and say, 'I'm here; I'm alive!'" Kamneel Maharaj said. "We thought maybe she was trying to tell us that everything was OK, so we were always hopeful."

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