

RESEARCH

Michigan Medicine team successfully separates conjoined twins

by Michal Ruprecht
September 24, 2020



Minutes into her ultrasound appointment in February of 2019, Alyson Irwin, who was 20 weeks pregnant at the time, and her husband Phil Irwin saw the technician turn off the screen and leave the room to get their physician.

“We knew something was going on right away,” Alyson said. “We had to sit there and wait and try to figure out what was going on. It felt pretty tense.”

The physician arrived and broke the news to the Irwins.

“They were pretty blunt about it and told us, ‘You’re pregnant with conjoined twins. I’m really, really sorry, but you’re going to have to decide what you’re going to do,’” Alyson said. “We felt pretty devastated. It’s just not something you would expect at all.”

One day later, the couple met with Dr. George Mychaliska, professor of pediatric surgery and obstetrics and gynecology. Mychaliska imaged the twins and counseled the couple through the process. Last month, the twins underwent the first **known** separation surgery at Michigan Medicine and in the state of Michigan.

“I counseled them back in the day when their babies were still fetuses,” Mychaliska said. “At that time, we had sophisticated imaging, including ultrasound, fetal MRI and fetal echo, which gave us a lot of anatomical information and we were hopeful a separation surgery would be possible.”

Alyson and Phil continued to see Mychaliska and his team throughout the pregnancy. The twins, Sarabeth and Amelia, were born on June 11, 2019. Born prematurely, the twins spent three months in the neonatal intensive care unit.

“It was kind of surreal,” Alyson said. “We knew the birth would take a while, and I would be stuck away from the girls for a while. But I was eventually able to hold the girls after a couple of hours, and it was very surreal to hold them.”

Sarabeth and Amelia were born conjoined from their chest to belly. Mychaliska noted both girls had separate hearts, lungs and gastrointestinal tracts, making them good candidates for separation surgery. Though their livers were fused together, he said the team knew they could separate the organ.

While the Irwins adjusted to a new life, they also began working with their care team to plan for the separation surgery.

“We were always on the same page. Given the specifics of conjoined twins, it’s just not very positive-looking,” Phil said. “If the girls were to make it and have any chance at all, it would be if they were separated. That was both of our mindsets from the beginning. We wanted to give them a life where they could live their best life independently from each other.”

Mychaliska led the surgical team, which consisted of more than two dozen specialists.

“I think it’s really an example of the importance of collaboration, because there’s no single physician who has the expertise in all of these areas,” Mychaliska said. “We all put our heads together and innovated solutions, and if we weren’t able to work as a team, we wouldn’t have been able to do this. I’m convinced of that.”

Mychaliska emphasized that the Irwin twins are extremely rare. He said about one in 100,000 to 200,000 pregnancies involve conjoined twins. Mychaliska said many conjoined twins aren’t able to survive. He added that Sarabeth and Amelia were the only pair of conjoined twins he’s seen in his 20-year career that were candidates for separation.

During their preparation for the operation, Mychaliska and his team faced two critical challenges: a successful separation of the twins and their livers, and the reconstruction of their chest and abdominal wall. His team used 3D models of the twins’ chest wall and liver to plan reconstruction.

“There can be complications with the surgery,” Mychaliska said. “Of the conjoined twins that survive delivery, many die within the first day or two of life because of certain anatomic and physiologic reasons. It’s a much smaller subset once you make it to delivery to be a candidate for separation.”

After more than nine months of preparation and choreographed simulations, the medical team was ready. But several days before the planned surgery last February, the twins got sick with a respiratory illness. After staying in the pediatric intensive care unit for 44 days, they returned home — only this time, they returned home during a pandemic.

On Aug. 5, 14 months after their birth, the twins returned to Ann Arbor, where they underwent an 11-hour surgery.

Mychaliska emphasized their use of an intravenous fluorescent dye to see an outline of one of the twin’s liver during the surgery, allowing them to precisely divide the liver into two livers. His team also had to take precautionary COVID-19 measures like the use of personal protective equipment.

“These techniques could be adapted to some other procedures, and it has been used in other procedures, but it turned out we could adapt its use to this situation,” Mychaliska said. “Many of the things we did to reconstruct these twins, we do in part on other children. We just had to adapt and innovate. Even during the surgery, we decided to place the twins at opposite ends of the same operating room table, and that way we had three surgeons work on each baby on the reconstruction, and we could communicate amongst ourselves to optimize the reconstruction.”

After the surgery, the twins recovered in the same room until their return home on Sept. 5. Alyson said she was excited that they would recover together.

“We were really worried about their psychological state of mind,” Alyson said. “On the day of the surgery, we found out that the girls would recover in the same room and that was one of the best gifts they gave us. We felt that was amazing.”

Several weeks after their surgery, Alyson and Phil noticed developments in Amelia and Sarabeth’s personalities. They said both twins still like to play together, but are more independent and prefer their own spaces. Alyson added that both twins are almost off of their supplemental oxygen.

The couple hopes to continue to share their story with other parents facing difficult pregnancies. Phil added their support group and faith helped them get through the whole process.

“We’ve always just been amazed by how every team at Michigan Medicine truly thought of everything to help take care of not just our girls, but us as a family,” Phil said. “The level of care at Michigan Medicine is the best in the world.”

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