Young Girl Benefits from BREAKTHROUGH Brain Surgery Technology

When 8-year-old **Alondra Resendiz-Ayala** began losing her balance and falling earlier this year, her mother Socorro Ayala knew the symptoms all too well. The Bloomington, Illinois girl's brain tumor was back.

In 2012, Alondra fell frequently and shook so much that she couldn't hold her crayons or a cup. She coped with pain in her legs and head. Alondra was diagnosed with a tumor in the cerebellum, the area at the back of the brain that helps coordinate movement. Pediatric neurosurgeons at Children's Hospital of Illinois successfully removed the tumor, and Alondra began a slow and difficult recovery. "She was like a rag doll," Socorro says. "She didn't have the strength to lift her head, to talk, to hold anything with her hands. She had to learn so much again."

This year, when Alondra suddenly needed to steady herself against a wall when she walked, Socorro immediately contacted doctors at Children's Hospital. An MRI revealed recurrence of her pilocytic astrocytoma brain tumor, a slow-growing type of tumor that most often occurs in the cerebellum and accounts for nearly one in five brain tumors in children. After monitoring the tumor's growth over a three-month period, doctors recommended that Alondra undergo surgery.

A NEW WAY TO OPERATE

Astrocytomas, the type of tumor that Alondra had, can spread widely throughout the brain and blend with normal brain tissue, making them difficult for surgeons to remove. If not removed completely, the tumor may return.

Fortunately, pediatric neurosurgeons at Children's Hospital now possess an innovative tool to address this type of tumor: an intraoperative magnetic resonance imaging (iMRI) machine. iMRI provides real-time, high-resolution images during delicate surgical procedures. Children's Hospital is the only institution in central Illinois—and one of only two centers in the state—with iMRI technology. Children's Hospital is also the only children's facility in Illinois with iMRI.

"iMRI is truly a game changer in advancing the treatment of brain tumors because we can map out the tumor and avoid damaging healthy tissue," says Tony Avellino, MD, MBA, a pediatric neurosurgeon and CEO of the OSF HealthCare Neuroscience Service Line and the Illinois Neurological Institute (INI). "The more tumor we get out, the better the outcome for our patients."

Neurosurgeons at INI at OSF Saint Francis Medical Center first used iMRI—which is housed in a hybrid operating room suite with an MRI machine and an operating table—in January 2016 to remove a brain tumor in a 27-year-old man. Alondra's May 2016 procedure was the second time that Children's Hospital employed iMRI for a child with a brain tumor.

"Many pediatric brain tumors are different than adult tumors in that they are in the hindbrain, which controls the most basic human functions," says Julian Lin, MD, a pediatric neurosurgeon at INI. "This technology is very helpful because

it gives us GPS-like imaging to precisely and safely remove tumors."

Before brain surgery, physicians use advanced software and imaging to identify the safest pathway to remove the tumor. Dr. Lin notes that the real-time, GPS-like imaging available during surgery with iMRI is also an improvement over conventional surgical navigation systems because the brain shifts once surgery begins.

TWO-STEP SURGERY

During Alondra's iMRI procedure, Dr. Avellino, assisted by Dr. Lin, removed her visible tumor. The pediatric neurosurgeons then stopped the operation to capture and study MRI images while Alondra remained under anesthesia. The intraoperative MRI revealed that all her tumor had been removed. A team of approximately 20 physicians and support staff cared for Alondra during the six-hour surgery.

Before the use of iMRI, the pediatric neurosurgery team would have closed the cranial incision and transferred the girl to postoperative recovery. An MRI to determine if the entire tumor had been removed would not have taken place until a day after the surgery, and would have required additional sedation and anesthesia. With iMRI, "the immediacy of information minimizes the risk of follow-up surgery, and reduces the emotional toll on families," Dr. Avellino says.

A BRIGHT FUTURE

Alondra made a rapid recovery from her most recent surgery, leaving the hospital with mobility and the ability to speak, and looking forward to a new school year. "I do not have enough words to explain the gratitude I have for the excellent staff, doctors, and nurses at Children's Hospital of Illinois," Socorro says. "Children's Hospital of Illinois was recommended to me, and I am glad because they have the latest technology with the best doctors and surgeons in the state."

Dr. Avellino adds, "The implementation of iMRI represents a public commitment by the Sisters of the Third Order of Saint Francis to improving the health of the population of central Illinois."

STATE-OF-THE-ART CARE, JUST AROUND THE CORNER

Delve into the details about how Children's Hospital's advanced technology and expert surgeons can help children with brain tumors by visiting **ini.org**.

ALONDRA RESENDIZ-AYALA continues to thrive after receiving life-changing care at Children's Hospital of Illinois.