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🌟 Reading Room 2010

Welcome to "Reading Room," where you can learn about the latest innovations in clinical practice and research in the Department of Radiology.

Helping Harry

May 28, 2010

By Kathleen Clute



For half of his young life, 10-year-old Harry Clark of Wellesley has been battling a benign but dangerous brain tumor called cranio-pharyngioma. The tumor robbed him of the sight in one eye. It grew back after three operations. Then, despite 29 sessions of proton beam radiation, it spawned a cyst that threatened his remaining vision.

Harry Clark

That's how Harry ended up at Children's Hospital Boston on Dec. 18, 2009, undergoing yet another operation. This time, however, the

recurrent tumor adhered to an artery as the neurosurgeons tried to remove it, injuring the vessel. The resulting hemorrhage and stroke temporarily weakened Harry's left side.

As the boy lay in an induced coma, the medical team evaluated his condition with angiography — an imaging technique that visualizes the blood vessels. They watched in alarm as blood leaked out of the damaged artery near the brainstem and pooled into a potentially life-threatening bubble known as a pseudoaneurysm.

"There was no surgical way to fix it and have Harry survive," recalled Eunice Groark, the boy's mother. "It was just terrible. That's when they turned to Dr. Orbach."

[Darren B. Orbach, MD, PhD](#), is director of [Neurointerventional Radiology](#) at Children's and one of a handful of specialists worldwide who specialize in minimally invasive, image-guided treatments of the brain, head and neck, and spine in children. Sometimes, neurointerventional treatments can make brain surgery unnecessary; often they complement it.

As Harry lay unconscious in the intensive care unit in the weeks after Dec. 18, the team pored over angiograms and MRIs of the menacing pseudoaneurysm.

We watched it over time and had a lot of conversations about whether he could live with it," said Groark about the consultations she and her husband, Kevin Clark, had with the medical team. Although a clot was forming at the site of the injury, enough blood was escaping that the

doctors worried it would rupture. Something had to be done.

Attempting a repair

The usual solution would be to block off the artery and allow the blood to flow via other pathways. But in Harry's case, the damaged vessel was the right posterior cerebral artery, which gives rise to tiny perforating vessels that nourish the brainstem. Shutting off blood flow to that vital structure was not an option.

"We were waiting and trying to figure out what to do," said Groark. "The aneurysm continued to grow, so Dr. Orbach's hand was forced."

Orbach decided to try to facilitate the repair of the damaged artery with an interventional radiology procedure known as [embolization](#). Guided by touch and a stream of X-ray images, he would snake a catheter through Harry's arteries to the site of the injury. Once there, he would use the catheter to deliver soft metal coils that would unfurl within the pseudoaneurysm, slowing or blocking the flow of blood into it. Each coil is less than one-third of a millimeter thick, with a three-dimensional shape 2-6 mm across. The goal: To create a sphere of clot and coils that would eliminate the threat of another life-threatening hemorrhage. Ideally, the endothelial cells in the arterial walls could then heal the damaged segment.

But two attempts at precisely positioning the microcatheter inside the pseudoaneurysm weren't successful; a third try was scheduled for Feb. 1. As Harry lay anesthetized on the table under surgical drapes, the fluoroscopy screens traced the catheter's probes and withdrawals in black and grey.

At 3:19 p.m., after nearly three hours, Orbach released the first coil from the catheter and watched it unwind into lazy circles within the pseudoaneurysm. At 3:36, he added the second, smaller coil to the tangle. And at 3:48, after checking to see that the third and smallest coil was properly in place, Orbach pumped his arm in the air with a jubilant "Yes! Yes!" The relief among the medical team and the observers in the control room was palpable.



**Darren B. Orbach
MD, PhD**

Harry was discharged from the hospital four days later, off to rehab to strengthen the left-side weakness that lingered from the stroke, and then back to the hospital for another angiogram on March 4 to monitor the coils and the pseudoaneurysm.

As he lay in the recovery room after the angiogram, Harry trounced an adult visitor at UNO, one of his favorite card games. When she complained about being beaten by a 9-year-old, he grinned mischievously and quipped: "A 9-year-old recovering from anesthesia!"

Harry's wit, attitude and ordinary boyishness have inspired all of his caregivers. When Harry wanted to see pictures of his brain, Orbach took the time to prepare a photomontage and e-mail it to the boy and his mom, along with explanatory text.

"There are patients who face life-threatening situations and prospects so daunting that most adults would despair, yet despair is one thing that we do not encounter in these children," said Orbach.

"In facing down the danger and persisting in being just kids, they bring out the best in all the adults around them," he continued. "Regardless of the underlying medical condition, adults find it absolutely impossible to despair when a child insists on getting more time on his Nintendo DS, or rolling his eyes and ignoring his parents, or fighting with his siblings. They are, absolutely, remarkably, 'normal' kids in every way, and to me, that makes them absolutely heroic. Harry epitomizes exactly this."

A team of specialists

"When there's a rare or difficult condition, this is one of the places people look for help," said

Orbach, who was recruited to lead neurointerventional radiology at Children's in 2009. In caring for patients with vascular disease, Orbach works closely with physicians in the departments of neurosurgery, radiology, otolaryngology, neurology and the Vascular Anomalies Center.

"We're unique in that we have this team of experts who can offer every kind of treatment," said Orbach. "And because of the remarkable plasticity of the pediatric brain, problems that would be neurologically devastating in adults can often be tolerated and effectively treated in kids."

Harry will continue to need highly specialized medical attention. Follow-up angiograms showed that the coils had not completely cut the blood flow to the pseudoaneurysm; another repair may be needed. The tumor will have to be monitored.

For now, though, he is back at home with his Mom, Dad and little sister Phoebe, filling his days with third grade, Cub Scouts, the card and board games he adores, swimming, biking and baseball. He continues physical and occupational therapy and has a tutor to help him catch up on the schoolwork he missed. Each night, he falls asleep under the gaze of his favorite Red Sox slugger, David Ortiz, whose full-size cutout dominates the room.

"What's so amazing about this is that you can potentially solve a life-threatening problem with no harm to the person," Harry's mother said. "This was the safest and best way to heal him."

Harry has been, and continues to be, treated by a multidisciplinary team at Children's Hospital Boston, including Edward Laws, MD; Ed Smith, MD; Mark Kieran, MD, PhD; and Yee Ming Chan, MD, PhD. Nurse Practitioner Carole Atkinson, RN, CNS, cares for Harry and other patients of Orbach's with vascular disease.

SPR Honors Two Radiologists from Children's

April 21, 2010

A Radiology Department faculty member and a fellow were honored at the annual meeting of the [Society for Pediatric Radiology](#) April 14-17 in Boston.

George A. Taylor, MD, was awarded the society's Jack O. Haller Award for Excellence in Teaching. Fellow Gabriella Crane, MD, and coauthors won a Caffey Certificate of Merit for their scientific poster titled "The New Faces of Sickle Cell Disease: A Multi-Modality, Head-to-Toe Pictorial Review." Nineteen other faculty members and fellows participated in the annual meeting as panelists or presenters, while 13 physicians from other departments of Children's Hospital Boston served as guest faculty.



Six radiologists from Children's were invited speakers and panelists:

- Stephen D. Brown, MD: [Ethical Issues in Prenatal Imaging](#)
- P. Ellen Grant, MD: Fetal MRI: Current Use, Challenges and Future Potential
- Tina Young Poussaint, MD: Imaging of Pediatric Brain Tumors: A Report from the PBTC Neuroimaging Center
- Caroline D. Robson, MB, ChB, Radiology Operations Vice Chair: [Head and Neck Neoplasms in Children](#)
- Lauren M. Sena, MD: Imaging of Tetralogy of Fallot
- Taylor: [The Pediatric Radiologist in Academics](#)

Two radiologists from the department participated in workshops:

- Edward Y. Lee, MD: Pediatric Central Airway MDCT Imaging
- S. Ted Treves, MD: Dose Reduction in Pediatric Nuclear Medicine

The radiology news site AuntMinnie.com featured [research](#) by Fellow Ryan Arnold, MD, showing