

Aligning the eyes: A simpler surgery for a complex condition

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People with strabismus (misalignment and limited movement of one or more eyes) are often teased about their crossed-eye appearance; those with more complex, disfiguring strabismus can become socially isolated and develop neck and back problems from having to turn their head to see properly. While surgery can correct eye position, it may require operation on several muscles, causing lengthy recovery, and sometimes overcompensates for the problem, requiring repeat operations. A single, simplified procedure adopted at Children's Hospital Boston has good results, researchers report, and allows for eye position to be fine-tuned in the recovery room or up to a week later, often avoiding re-operation.

In the February [Archives of Ophthalmology](#), a team led by David Hunter, MD, Chief of Ophthalmology at Children's Hospital Boston, reports the results of a procedure known as superior rectus transposition with adjustable medial rectus recession in 17 patients with complex [strabismus](#) who could not move an [eye](#) outward. To compensate, patients had to tilt their head far to the side, causing problems with balance.

The new procedure enables outward eye movement by repositioning a muscle that normally moves the eye up. "In transposition surgery, we take a force that's moving the eye up or down and translate some of it over to the side, by moving the muscle over," Hunter explains. "This simplified procedure for a complex and disfiguring problem is changing the lives of these children and adults."

Previous transposition procedures have had unintended consequences,

such as over-correcting and reducing the eye's inward movement, or causing the eye to become vertically misaligned (gazing abnormally upward or downward). Repeat operations are then needed.

Unlike earlier procedures, the new procedure adjusts a single muscle, the superior rectus, to rotate the eye into place. In some cases, the medial rectus [muscle](#) is also adjusted, but the inferior rectus, the source of previous complications, is left alone. The operation also uses an adjustable sliding "noose" knot to pull the eye muscles. The knot can be tightened or loosened afterward to adjust the eye's position -- in the recovery room or up to a week after surgery.

"As strabismus surgeons, we cannot always guarantee optimal alignment after surgery," says Linda Dagi, MD, director of the Adult Strabismus Program at Children's Hospital Boston and a coauthor on the paper. "For this reason, we have found the adjustable suture technique to be the best option for patients."

In their study, Hunter and colleagues reviewed long-term outcomes of 17 children and adults undergoing the surgery (10 with Duane syndrome, a congenital form of strabismus, and 7 with sixth-nerve palsy).

Overall, horizontal eye movement improved about 45 percent, and inward-turning or crossing of the eye improved by about 75 percent. Outward movement also improved, at only minimal cost to inward movement. Eight of the 17 patients regained depth perception. Three patients with especially complex problems required a repeat operation.

Patients' angle of head turn improved from 28 degrees to a barely noticeable 4 degrees. No patient developed a significant problem with vertical eye alignment, a potential risk of the procedure.

For more on the procedure, view a live Webcast about the operation in a

9-year-old girl.

Reshma Mehendale, MD, was first author on the paper. The study was supported by the Children's Hospital Ophthalmology Foundation, Harvard Catalyst, the Harvard Clinical and Translational Science Center and the National Institutes of Health.

"Superior rectus transposition is a significant simplification of a procedure for patients with a difficult problem that seems to be just as effective as the more complex [procedure](#), and with a lower complication rate," says Hunter. "Almost every patient goes home with their eyes where we want them to be."

Provided by Children's Hospital Boston

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