

Doctors perform living donor stem cell transplants in eye patients

May 5 2014, by Jim Ritter

Debra Astrug, who once feared she was going blind, can see fine now, thanks to a stem cell transplant she received from her daughter, Jessica.

The stem cells came from two pieces of tissue that Dr. Charles Bouchard of Loyola University Medical Center removed from the cornea of Jessica's left [eye](#). When Bouchard proposed the innovative procedure, she immediately agreed.

"It's my mom," Jessica said. "If she needs part of my eye, she's got it."

Before the transplant, Debra Astrug's vision was extremely blurred – like looking through a glass smeared with Vaseline. She could not read or drive. And when Jessica took her to buy groceries, Debra had to bring a magnifying glass to read labels.

"It was horrible," she said.

But since receiving the stem cell transplant, and wearing special contact lenses, Debra Astrug's vision has improved to 20/25.

Loyola is among a handful of centers that perform living-related corneal stem cell transplants on patients who have too few corneal stem cells. Ophthalmologists traditionally have treated such deficiencies by transplanting stem cells from deceased donors. In these cases, in order to prevent the patient's immune system from rejecting the donated stem cells, patients take immune-suppressing drugs for several years or longer.

But such drugs can have toxic side effects and also increase the risk of infections, said Bouchard, who is chair of Loyola's Department of Ophthalmology.

Bouchard is performing corneal/limbal [stem cell transplants](#) from living donors who are first-degree relatives of patients. Because the donor and recipient are closely related, most patients can avoid taking systemic immune-suppressing drugs.

Stem [cell transplants](#) are the treatment of choice for patients who have severe cases of limbal stem cell deficiency, or LSCD. (Limbal refers to the border of the cornea and sclera. The cornea is the transparent front part of the eye, and the sclera is the white part of the eye.)

Stem cells are undifferentiated cells that have the ability to develop into specialized cells. For example, if the cornea is scratched, stem cells generate new cells that migrate to the damaged area and then divide and mature into corneal cells to repair the damage.

In LSCD, the cornea becomes covered with abnormal vascularized tissue that has migrated from the conjunctiva (the mucus covering the white part of the eye). LSCD can be due to various causes, including a chemical burn; a severe whole-body allergic reaction to medications called Stevens-Johnson syndrome /toxic epidermal necrolysis; multiple eye surgeries; and long-term use of eye drop medications.

In Astrug's case, the stem cell deficiency was due to graft-versus-host disease, a side effect of a bone marrow transplant that successfully treated a prior cancer.

In a living-related corneal donor transplant, Bouchard scrapes away abnormal tissue from the patient's eye. From the donor's eye, he removes two tiny slices of tissue, which contain [stem cells](#). He transplants them

into the recipient's eye, attaching them with biologic glue. The tissue taken from the donor eye grows back in about a month.

Jessica Astrug donated tissue as an outpatient procedure. Her only discomfort came from the stitches, which were removed after two weeks. The donation had no effect on her vision. "It's like it never happened," she said.

Debra Astrug said she experienced only minor pain after the transplant. "I took ibuprofen and I was fine."

Debra Astrug said any of her three grown children would have donated. Jessica was the logical choice because she lives the closest. Debra Astrug, 56, lives in Elgin, Ill. Jessica Astrug, 31, lives in Pingree Grove.

"It's something families do for one another," Debra said. "I would lay down my life for my children."

Bouchard said a living-related corneal stem cell transplant can restore good-to-excellent vision, without putting the patient at risk from the side effects of immune-suppressing drugs.

"This procedure is an example of the state-of-the-art surgical techniques that Loyola's corneal services can provide to [patients](#) with more complex eye problems," Bouchard said.

Provided by Loyola University Health System

Citation: Doctors perform living donor stem cell transplants in eye patients (2014, May 5) retrieved 4 October 2023 from <https://medicalxpress.com/news/2014-05-doctors-donor-stem-cell-transplants.html>

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