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New Therapies: The Basics

Dr. Albini:
Revakinagene taroretcel is a new treatment for adult idiopathic macular telangiectasia type 2, or MacTel type 2. What is it? And how does it work? This is CME on ReachMD. I'm Dr. Thomas Albini, and here with me today is my good friend, Dr. Roger Goldberg, to help answer these questions.

Dr. Goldberg:
Thank you for having me. In a previous episode, we discussed how we need to replace the trophic factors that are lost when Müller cells die off. Müller cells are really important because they produce the neuroprotectant ciliary neurotrophic factor, or CNTF, which works through the JAK/STAT3 prosurvival pathway to protect and preserve photoreceptors.

Intravitreally injected CNTF has a short half-life on the order of like 1 to 3 minutes, and systemic administration is not feasible since CNTF does not cross the blood-retina barrier. So really, one of the key components here to NT-501, or revakinagene, is the encapsulated cell technology. It's a way to be able to deliver sustained and prolonged levels of CNTF to help treat patients with MacTel. Encapsulated cell technology, it involves a semipermeable membrane that houses genetically engineered RPE cells. And this semipermeable membrane allows for the diffusion of nutrients into the capsule to feed those RPE cells, and it allows the CNTF that those RPE cells produce to exit and impact and protect the photoreceptors. A special scaffolding supports the cellular structure, and there's a titanium clip at one end that facilitates surgical implantation.

Tom, you've been a part of the clinical trials. Can you tell us about the implant procedure?

Dr. Albini:
Yeah, I'd be happy to.

The specific instructions for the implantation are available in the package insert and on the sponsor website. And it's super important that these instructions are followed to the letter, and I'll tell you why as I go through them real quickly.

It starts off with the peritomy, and the implant then comes in culture media, and the cap is unscrewed, and the implant is attached to a little forcep-like device holding the titanium loop on the implant, and it's removed from the culture media. And then a 9-0 Prolene suture is put through the titanium loop to serve as a leash on the implant, as the implant is then inserted into the 3-mm sclerotomy.

An anchoring knot needs to be made over the titanium loop, and that's to ensure that the titanium loop is constantly pushed into the vitreous cavity. Without that knot, if you put tension on the suture, it would pull the titanium loop into the scleral incision, which is exactly what you don't want.

So after that anchoring knot is tied, then you take the scleral bites on each side for 90% to 99% thickness. The suture is tied, they're left

long, sort of as we used to do with the fluocinolone acetonide implant. And then, unlike what we used to do with the fluocinolone acetonide implant, you take a little scleral bite on each side and cut the sutures outside of those scleral windows, out of those scleral bites, and that serves to keep that Prolene suture flush against the sclera and minimize the chances of it protruding through the conjunctiva. Two more nylon sutures are then placed on each side and rotated. Those bites are slightly less deep at 75% to 80% depth. And then, I can't emphasize enough, this is not a resident's first vitrectomy conjunctival closure with one 6-0 plain gut. This is a careful conjunctival closure with multiple interrupted sutures to make sure that those sutures are well covered and that the implant's well buried.

Dr. Goldberg:
Well, that was a great summary, Tom, of the implant procedure. I was also in the clinical trial. This is a patient of mine with bilateral MacTel type 2 and had the implant placed in the left eye in January of 2020. And you can see, kind of nearly 5 years later, there's been basically stabilization of the photoreceptor loss in the left eye and marked progression in the untreated fellow eye, in the right eye, over that period of time. So this is a patient where, in the fellow eye, I'm eager to get her treated now that there's an FDA-approved therapy.

Dr. Albini:
I couldn't agree more. And I'm super excited to have these available for my patients. And this has been a great discussion. Unfortunately, this is all the time that we have. Thanks to the audience for your attention, and thank you, Roger, for being so awesome as you always are.

Dr. Goldberg:
Thanks, Tom.