First retinal implant surgery in the Middle East

Riyadh, Saudi Arabia, February 4, 2013

A retinal prosthesis known to many as “the bionic retina” was implanted for the first time in the Middle East in a patient at the King Khaled Eye Specialist Hospital (KKESH), Riyadh, Saudi Arabia, on February 2. Called the Argus II Retinal Prosthesis System, it was surgically implanted by Dr. Fernando Arevalo, Adjunct Professor of Ophthalmology at Wilmer Eye Institute (Retina Division) at Johns Hopkins University School of Medicine, and Chief of the Vitreo-retinal Division at KKESH, who reports that the patient, who has an advanced form of retinitis pigmentosa (RP), is doing well, with no inflammation, and the implant looks in excellent location in the retina. A second Argus II Retinal Prosthesis surgery was performed on February 3 by Dr. Arevalo’s team on another patient with RP. The Argus II received European marketing approval (CE Mark) as the result of a three-year international clinical trial, which demonstrated the device’s long-term safety, performance and reliability. It is the first artificial retina to receive marketing approval anywhere, and its developer, Second Sight Medical Products, has obtained FDA recommendation for approval in the United States.*

There are an estimated 1.2 million people worldwide with RP, including 100,000 in the United States. Numerous strategies to treat RP have been investigated, including intravitreal injection of growth factors, genetic therapy, vitamin A supplementation, surgical transplantation of the neural retina and retinal pigment epithelium, ozone therapy, and electrical stimulation. Unfortunately, none of these have been effective.

The Argus II is 3 x 5 mm in size, which corresponds to a letter size page at hands distance. This is what is needed to provide mobility. It consists of a 60-electrode grid, about 200 micrometers in diameter – i.e.

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*For more information, see the original article in Vis. Pan-Am. 2013;12(2):58-59.
a little over the width of a hair, surgically implanted on the retina, where the electrodes transmit information taken from an external video camera mounted on a pair of eyeglasses worn by the user. A series of small electrical pulses that are transmitted wirelessly to an array of electrodes on the surface of the retina. These pulses are intended to stimulate the retina’s remaining cells resulting in the corresponding perception of patterns of light in the brain. Patients then learn to interpret these visual patterns thereby regaining some visual function. The device has enabled clinical trial participants who are profoundly blind, due to damaged photoreceptors, to see shapes, locate objects and recognize large letters. Users of the device perceive patterns of light, which they learn to interpret as vision.

Over the next couple of weeks, according to Dr. Arevalo, the implanted Argus II will be tested and customized for the patients. If the process, which includes training and rehabilitation, goes as planned, the patients may be using the device at home by the end of this month. The Argus II is a second-generation version of the device, which, originally, had a 16-electrode grid. “We have known of several patients who have been implanted with the Argus II and can perceive color, future generations of Argus II maybe upgraded to one day restore color vision for these blind patients” said Dr. Arevalo. Dr. Arevalo added “As I was implanting the first device in this area of the world I could only think about all the hard work that my team had made to get us here, and how many patients we will benefit with this implant in Saudi Arabia and worldwide”.

* The U.S. Food and Drug Administration on February 14, 2013 approved the Argus II Retinal Prosthesis System, the first implanted device to treat adult patients with advanced retinitis pigmentosa (RP).