The mysterious case of the boy missing most of his visual cortex who can see anyway

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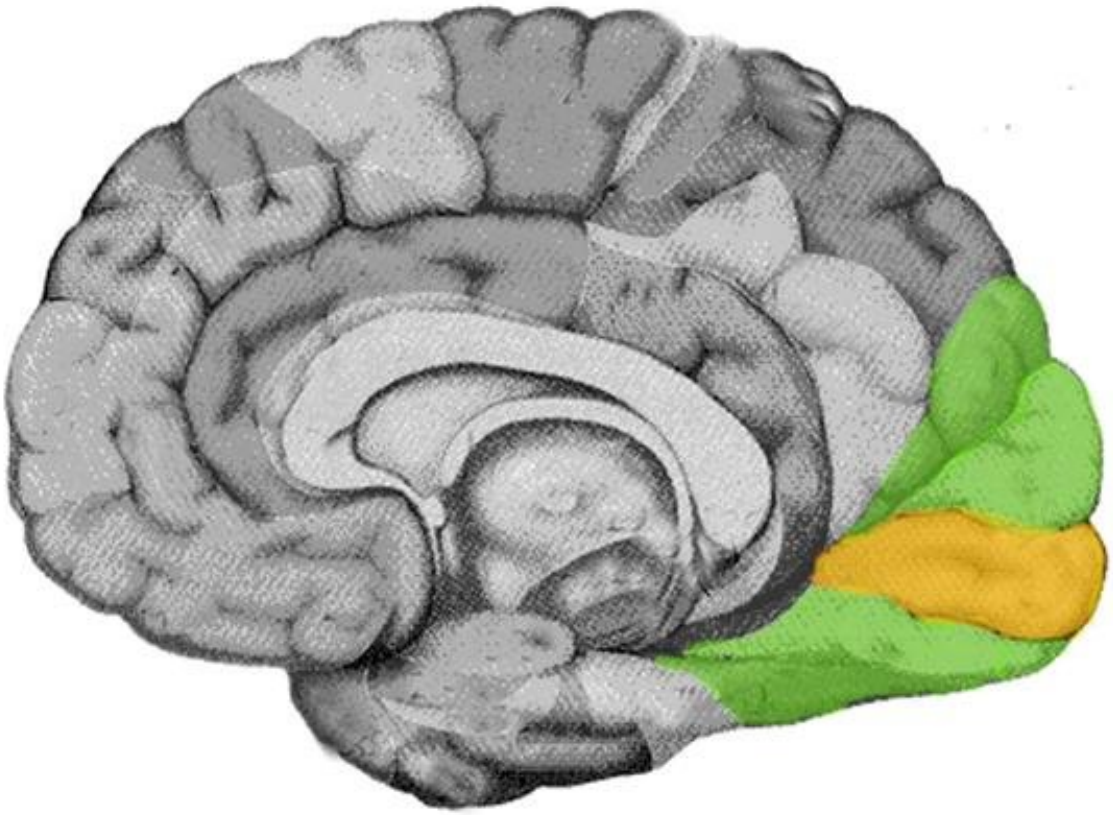

Credit: public domain

(Medical Xpress)—A team of researchers with Monash University recently gave a presentation at a neuroscience conference in Australia

outlining their study of the brain of a seven-year-old boy who was missing most of his visual cortex but could still see—the first such case ever known.

The boy, the researchers told the audience, suffered major damage to his visual cortex as a result of medium-chain acyl-Co-A dehydrogenase deficiency at just two weeks old—a rare condition that results in severe damage to nerve cells due to an inability to convert some types of fats into energy. That meant the boy, who the researchers referred to as B.I., wound up without most of his visual cortex, a condition that for most people would result in cortical blindness. Cortical blindness is an odd condition in which the brain can still receive visual input, but cannot process what is seen, leaving the person with the sensation of sight without being able to actually see. But oddly enough, B.I. can see almost as well as any other boy his age.

B.I. caught the attention of the team at Monash due to his medical history—intrigued, they sought to test the boy and his vision, and find out why he could see despite his brain injury.

In testing B.I.'s vision, the researchers found that he was somewhat near-sighted but was otherwise fine, except for the occasional lapse when faced with false-colored objects such as a blue banana. He could play soccer, for example, and video games, and make out the difference in emotions on a person's face.

To find out why the boy could still see, the researchers observed him in an MRI machine and watched what happened as he processed images. By focusing on the middle temporal visual area, the researchers found an enlarged visual pathway of neural fibers that ran through two areas on the back of the brain where the visual cortex resides. One of the areas called the pulvinar is normally involved in managing sensory signals, the other, called the middle temporal area, is normally involved in detecting

motion. In B.I.'s case, the pathway had grown larger than normal to allow it to do the work that his visual cortex was supposed to do, allowing him to see—a form of neuroplasticity.

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