

Topic categories: Neurosciences

Brain Areas Involved in Self-Body Image Reconstruction

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Introduction: The concept of self-face/body image is very complex because it combines the interaction of multiple factors of body experience and perception. When this self-face/body image concept is altered by the loss of an eye, neurobiological and psychological brain reorganization occurs. A missing eye can be replaced by a prosthetic eye, which gives the person an opportunity to build a new self-face/body image. Even though, it is known that neurobiological changes occur, brain areas involved in constructing a new self-face/body image are not known.

Objective: To identify brain areas involved in the reconstruction of the new self-face/body image.

Material and Methods: blood oxygenation-level dependent signal was obtained through functional magnetic resonance imaging of three individuals who had lost their left eye under different circumstances and were experiencing for the first time the use of a new a prosthetic eye. Individuals agreed to take part in this study and signed a voluntary consent form at the School of Dentistry of the Universidad Nacional Autónoma de México that follows the Basic Principles of the Declaration of Helsinki and also assented in accordance with the Universidad Autónoma Metropolitana scientific review board. Psychological interviews were also performed to obtain a verbal description of how these individuals felt using their new prosthetic eye and how the prosthesis had changed their self-face/body image.

Results: We found that the first impression of observing themselves with the new prosthetic eye resulted in activation of two brain areas, the calcarine and the central sulcus. From psychological data it was also determined that wearing a prosthetic eye helps these patients to construct a new self-face/body image.

Conclusions: Thus, the calcarine and the central sulcus participate in the initial steps of the reconstruction a new self-face/body image.

Keywords: brain, calcarine, central sulcus, self-face image, sefl body image