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Optic Ataxia and its correlations with "How" stream Visual Pathways

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Abstract

Introduction: *Optic ataxia is a neurological condition with clinical manifestations resulting in disturbances of visually guided hand movements on reaching for a target object. Previous studies failed to provide substantial evidence for the structural pathway damaged by this condition. This study aims to identify the neural structural connections affected by optic ataxia while correlating its functional importance and clinical implications, using "Diffusion Imaging fiber Tractography".*

Methods: *The observational analysis, used ten healthy adults, ultra-high b-value, diffusion MRI Datasets from an Open access platform. The datasets, ranging from both sex, between 20–59 years, with mean age of 31.1 years. The analysis process includes, data processing and fiber tractography using software tools.*

Results: *The fibers were traced, and identified for "Dorsal" stream pathways involved in visual objects spatial orientation. Fibers from this "Dorsal" stream pathways, extends between the "Visual cortex (Brodmann Areas 18 and 19) and Superior Parietal Lobule (Brodmann Area 7)", demonstrating unconscious integration of visuospatial information. These neural structural connections, helps in targeting precise motor movements towards the visually perceived object.*

Conclusion: *The current observations offer knowledge to comprehend the structural existence and functional correlations for visuo-motor coordination pathway or "how" stream pathways in visual perception. Damage to this "how" stream fibers in the visual pathways manifest as Optic ataxia. This study provides a guideline for surgical practices to prevent damages to these areas during neurosurgical interventions.*

Keywords: *Optic ataxia; visuo-motor coordination; fiber tractography.*