

Social cognition deficits in patients affected by brain tumours: role of lesion location and surgery

Relatore: dott. Fabio Campanella

Personality changes and, more generally, behavioural alterations are very common complaints among patients affected by brain tumours and their relatives. These can originate from psychological reactions to cancer diagnosis, or from side effects of corticosteroids or antiepileptic drugs. Some of these changes can however also be linked to damage to specific cognitive modules processing the so-called Social Cognition. Here we present the results of three studies, performed between 2014 and 2022, showing how, in patients affected by brain tumours, lesions located in specific brain regions can produce a variety of cognitive impairments in the field of Social Cognition, ranging from facial emotion recognition deficits to “genuine” personality disorder.

In the first study, we discuss how damage to the anterior temporal lobe is often linked to facial emotion recognition disturbances and damage to the Temporo-Parietal Junction (TPJ) can produce deficits in attributing mental states to others (Theory of Mind) basing on perceptual cues. On the other hand, damage to the medial portions of the frontal lobe is linked to disturbances in the ability to describe, imagine and represent (mentalize) one’s own emotions (Alexithymia) and damage to the more lateral portions of the frontal lobe seem to be linked to lower scores in a Self Maturity measure.

In the second study, we discuss the impact of surgery over these social cognition modules showing how surgery has indeed an immediate negative effect, but this appears to be significant only in patients affected by Low Grade Gliomas (LGG), being non-significant for patients affected by High Grade Gliomas (HGG) and negligible for Meningiomas. These effects are however only transitory and, in any case, significant only over those more “perceptual” components of Social Cognition (facial emotion recognition and perceptual attribution of mental states).

In the last study we investigated the anatomical underpinnings of different facets of the ability to evaluate other people’s mental states during social interactions (Theory of Mind, or “ToM”), distinguishing between the ability to attribute emotional states (Affective ToM: associated to damage to the right anterior temporal lobe) and mental/cognitive states (Cognitive ToM: associated to damage to the right parietal lobe). On the other hand Frontal lobe lesions appear to be associated to a more “diffuse” ToM deficit, but involving also more generally abstract/causal reasoning abilities.

All the results are finally briefly discussed in the frame of future useful directions for the clinical research on this topic.