

VISUAL STREAMS' HALLUCINOSIS: Characterization of Charles Bonnet syndrome due to lesions localized in the visual system

Laura Mirandola^{1,2}, Annalisa Chiari², Giulia Monti², Giada Giovannini², Stefano Meletti^{1,2}, Matteo Martinoni³

1: Department of Biomedical, Metabolic and Neurosciences, University of Modena and Reggio Emilia. Email: laura.mirandola@unimore.it

2: Department of Neurology "Azienda Ospedaliero-Universitaria" Modena

3: Department of Neurosurgery "Azienda Ospedaliero-Universitaria" Modena

AIM

to characterize a particular type of visual hallucinosis, also defined as Charles Bonnet syndrome (CBS), in patients harboring cerebral lesions involving visual system.

INCLUSION CRITERIA

1. Patients with complex visual hallucinations who criticize them
2. No psychiatric symptoms
3. Proven lesion in the visual areas

Questionnaire for complex visual hallucinations

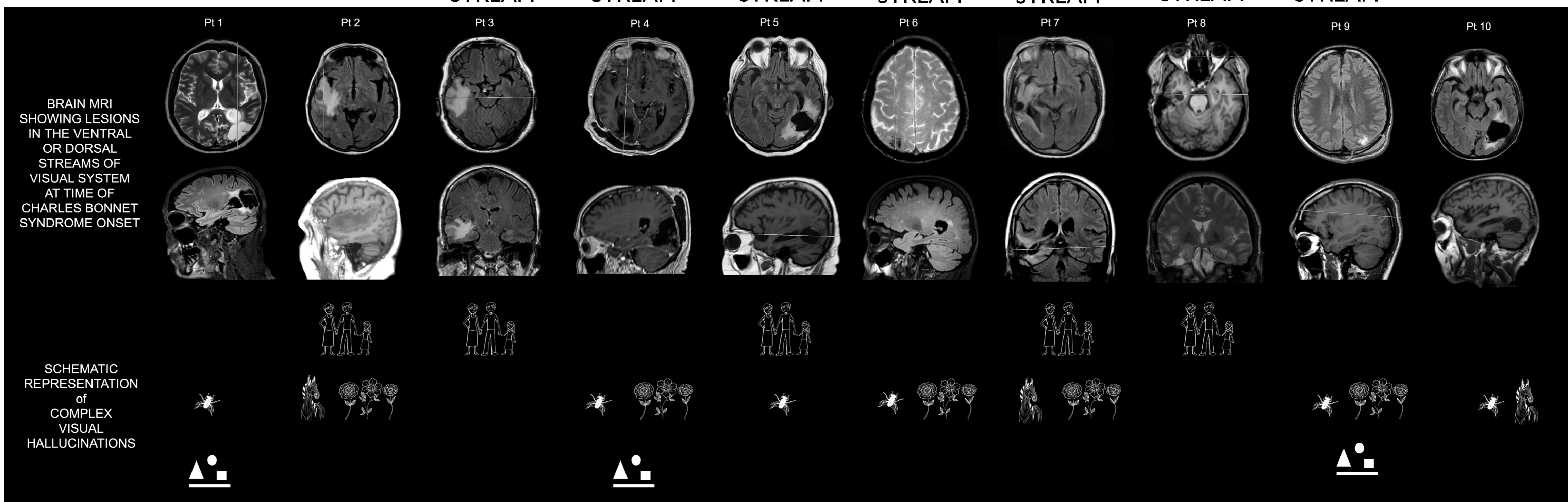
1. **What** do you see?
 - a. Do you see people? Faces? Familiar or unfamiliar? What are they doing?
 - b. Do you see animals? Which animals? What are they doing?
 - c. Do you see geometric figures, such as dots, lines, or other shapes?
2. Which colour has the object that you are seeing?
3. **Where** is the object in the space?
 - a. Left/right, up/bottom?
 - b. Is it moving?
4. Do you see it with eyes open and closed?
5. Do you feel an emotional involvement?
6. Has it changed in time? How long did the hallucinations last?

REVIEW

1. Clinical data: medical history, neurological examination, clinical features
2. Neuroimaging data (brain MRI)
3. Neurophysiological data (video-EEG)
4. Neurosurgical data
5. Questionnaire administration
6. Video recordings of patients describing hallucinations

METHODS

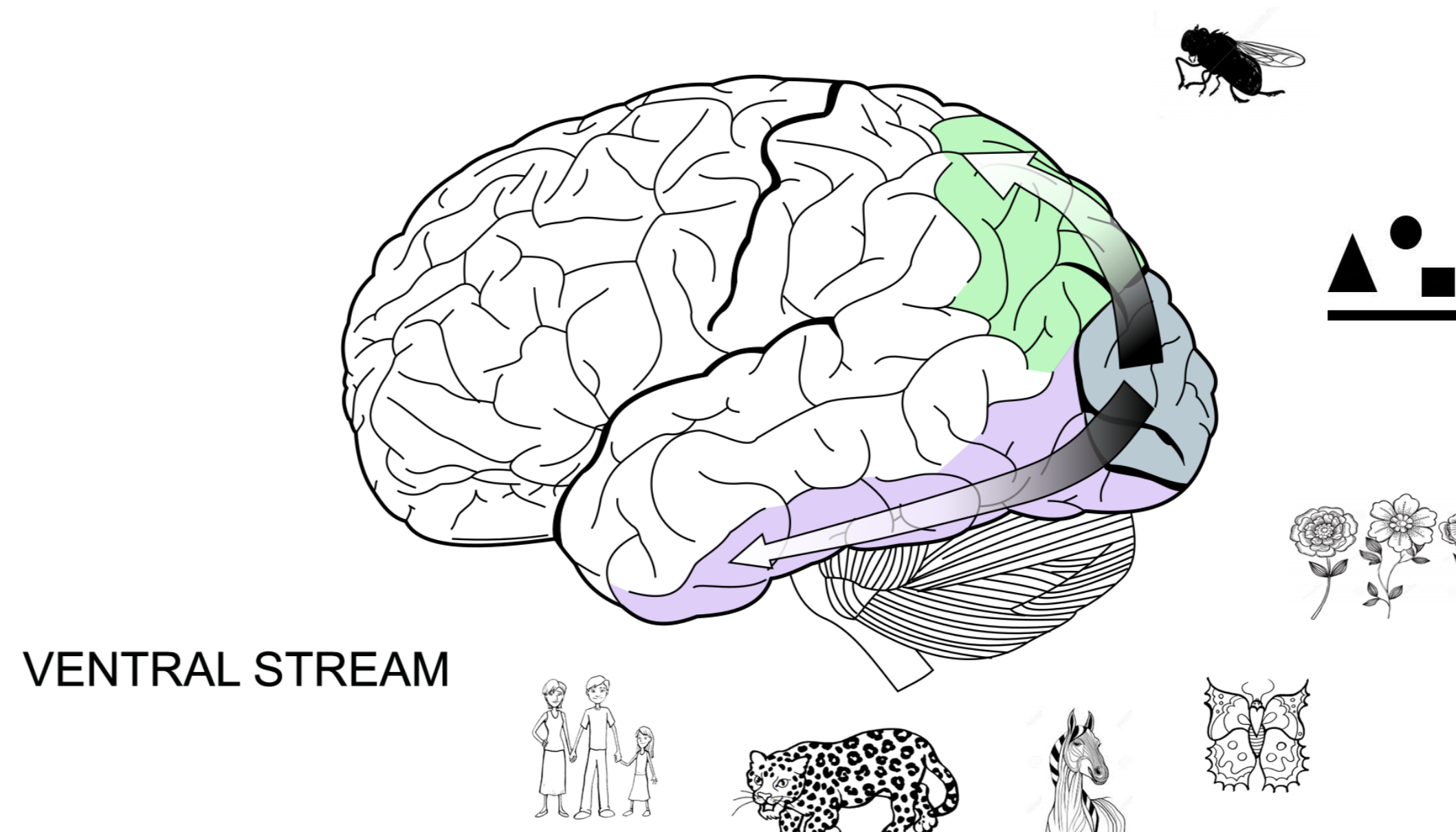
Anaplastic astrocytoma DORSAL STREAM	B-cells Lymphoma VENTRAL STREAM	B-cells Lymphoma VENTRAL STREAM	Ependymoma VENTRAL STREAM	Breast cancer metastasis VENTRAL STREAM	Subarachnoid hemorrhage DORSAL STREAM	Anaplastic astrocytoma VENTRAL STREAM	Cavernoma VENTRAL STREAM	Oligodendro glioma DORSAL STREAM	Glioblastoma VENTRAL STREAM
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Seven patients (pt. 2,3,4,5,7,8,10) had lesions localized in the **VENTRAL STREAM**. Three of them (2,3,8) had intact optic radiations.

- Complex heterogeneous visual hallucinations
- People, faces, little kids
- Big animals such as horses, lions, leopards, cows, cats, dogs, mainly in groups
- Flowers, grass, butterflies
- Multicoloured
- Moving mainly from one side to the other or from top to down, in a linear movement
- Two patients felt fear, the other had no emotional involvement

DORSAL STREAM



Three patients (pt. 1,6,9) had lesions localized in the **DORSAL STREAM**. Two of them (6, 9) had intact optic radiations. One of them (6) did not receive neurosurgery.

- Simple geometric shapes
- Insects
- Black
- Moving in circle
- No emotional involvement was described

1- Patients with cerebral lesion along associative visual areas without visual field defects may present complex visual hallucinations. Visual loss is not mandatory.

2- First report of CBS due to cerebral lesion "per se", not all surgical patients

3- Complex visual hallucinations manifest with different features with a kind of complexity gradient going from the primary visual cortex to the secondary associative cortices.

DISCUSSION New Elements