926-4
Charles Bonnet Syndrome
Differential Diagnosis of Recurrent Complex Visual Hallucinations

1. Medication(s)
2. Metabolic status
3. Psychiatric etiology including mania, depression, substance dependence and schizophrenia
4. Neurodegenerative diseases (e.g. Lewy Body Dementia, Alzheimer’s and Parkinson’s disease)
5. Release hallucinations – Charles Bonnet Syndrome
Release Hallucinations: Charles Bonnet Syndrome

Characterized by the triad:
1. Complex visual hallucinations (CVH)
2. Ocular pathology causing visual loss
3. Absence of cognitive impairment

Charles Bonnet described a case of complex hallucinations due to visual loss association with cataracts in his cognitively intact grandfather in 1760.
Complex Visual Hallucinations

The images are of normal size and shape
Very brightly colored
Fully recognized as flower floating, women in caps, and images of men
Occasionally seen with eyes closed
Not completely obscuring her field of vision but floating
Spontaneous Hallucinations

Figure 1. Spontaneous hallucinations. Positive correlations between T2*-weighted MRI signal and hallucination report are superimposed (red) on transverse sections of high-resolution structural images.

The fusiform gyrus has been shaded in blue to aid anatomical localization. The hallucinations are illustrated next to each image. Ventral occipital activity was consistent in repeated experiments on the same patient.

No areas had a negative correlation at the same level of significance. In all figures, the left of each structural image is the right of the brain.
Figure 1. Spontaneous hallucinations.

Figure 2. The factor analysis of phenomenological variables. The factor analysis of phenomenological variables. Only the first three factors are displayed. The core variables of factor 1 are shaded red, core variables of factor 2 are shaded green and core variables of factor 3 on the periphery of each factor are enclosed by the shaded border.

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The image results implied that
1. Each specialized visual area had its own associated hallucination and
2. The pathophysiology of the hallucinations involved a localized increase in cerebral activity.

Three Visuopsycho-Syndromes

The first consisted of hallucinations of extended landscape scenes and small figures in costumes with hats.
The second, hallucinations of grotesque, disembodied and distorted faces with prominent eyes and teeth; and the third, visual perseveration and delayed palinopsia.
Visuopsycho-Syndromes

The investigators hypothesized that the three visuopsycho-syndromes mirror the segregation of hierarchical visual pathway interstreams and suggest a novel theoretical framework for the pathophysiology of three visual syndromes.

Table 141-1. Classification of Higher-Order Visual Impairments According to Whether the Lesion Is in the Superior or Inferior Visual Association Cortex

<table>
<thead>
<tr>
<th><strong>Inferior (Temporo-Occipital Cortex) Visual System Disorders</strong></th>
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<tbody>
<tr>
<td>Pure alexia</td>
<td>Left occipitotemporal</td>
</tr>
<tr>
<td>Object agnosia</td>
<td>Bilateral inferior occipitotemporal</td>
</tr>
<tr>
<td>Prosopagnosia</td>
<td>Large left inferomedial occipitotemporal</td>
</tr>
<tr>
<td>Prosopagnosia</td>
<td>Bilateral inferior occipitotemporal</td>
</tr>
<tr>
<td>Prosopagnosia</td>
<td>Large right inferomedial occipitotemporal</td>
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</tbody>
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<table>
<thead>
<tr>
<th><strong>Superior (Parieto-Occipital Cortex) Visual System Disorders</strong></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Neglect</td>
<td>Contralateral parieto-occipital (left neglect more severe)</td>
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<tr>
<td>Visually guided movements</td>
<td>Contralateral parieto-occipital</td>
</tr>
<tr>
<td>Balint’s syndrome</td>
<td>Bilateral parieto-occipital</td>
</tr>
<tr>
<td>Primary dressing disorder (&quot;dressing apraxia&quot;)</td>
<td>Right superior parieto-occipital</td>
</tr>
<tr>
<td>Ideational apraxia</td>
<td>Left parietal</td>
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<tr>
<td>Visuoconstructive disorders</td>
<td>Either left or right parietal</td>
</tr>
</tbody>
</table>

Figure 3. Pathway streams for vision, the ventral stream leading to the temporal lobe [visuopsycho-syndrome number 1] the dorsal stream leading to the parietal lobe [visuopsycho-syndrome number 3].
Figure 4. A lateral and ventral view of the human brain. The brain regions hypothesized as being related to the three visual psycho-syndromes are shaded. The ventral occipitotemporal cortex activated by objects (Kanwisher et al. 1996, Halgren et al. 1999) and extended scenes (Epstein and Kanwisher 1998) is shaded red. The STS region sensitive to eye movements and gaze in face stimuli (Puce et al 1998, Wicker et al 1998) is shaded green. The intra-parietal region containing eye-centered reference frames (Duhamer et al 1992) is shaded yellow.
Visual Perseveration

The hypothesis that the third visuopsychosyndrome relates to the parietal projection of the dorsal stream is supported by Critchley’s observations in 1951, that delayed palinopsia and visual perseveration are associated with lesions in the parietal lobe.

References


http://www.library.med.utah.edu/NOVEL