Cases of dementia with confabulations: Alzheimer or not Alzheimer?

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Confabulations are defined as actions and verbal statements that are **unintentionally inconguous** to the patient's history, backgrounds, present and future situation.

- **Spontaneous:** they represent a mind failure to recognize the correct temporal order of memories: they are the result of the intrusion of old memories into ongoing thinking and they are independent from any external stimulus

- **Provoked:** they are new memories produced in response to direct questions; they are considered a strategy of compensation, the result of the attempt of the patient to recollect information from his deficient memory.

Confabulation battery

Patients with Alzheimer's disease confabulate less in comparison to patients with **frontal lobe impairment**, such as Wernicke-Korsakoff syndrome and frontotemporal dementia and typically present spontaneous confabulations in advanced stages.

We analysed two patients with memory impairment and **confabulations since the onset**: they performed neuropsychological assessments including the Confabulation Battery, neuroimaging and cerebral FDG-PET.

First case: A.R.

First visit in 2017 : 77-year-old woman with memory impairment, spatial disorientation and confabulations since the onset.
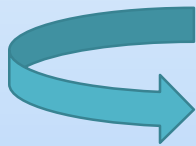
She narrated journeys she never made giving reasons for the lack of proofs
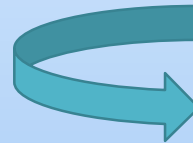
Secondary claims

❖ **Head CT:** subtle enlargement of the temporal horns for adjacent parenchymal atrophy

❖ **FDG-PET**: mild hypometabolism in temporo-mesial, posterior dorsolateral parietal region and in precuneus bilaterally and in temporo-lateral region on the right side

❖ **Confabulation Battery**: she produced provoked confabulations in only 5 questions out of 169.

❖ **Neuropsychological assessment**: mostly normal; MMSE 28/30

Test	Score	Cut-off
Verbal memory		
Rey words		
Immediate recall	43,2	<28,53
Delayed recall	6,9	>4,69
Visuospatial memory		
Cube test	3,75	> 3,5
Rey complex figure copy	31,2	> 23,76
Rey complex figure immediate recall	7,3	> 6,44
Rey complex figure delayed recall	5,9	> 6,33
Frontal Functions		
Clock test	12	> 10
Phonemic verbal fluency	45,5	> 17,35
Attention		
Digit symbol substitution test	38	> 5
Stroop Test	6,5	< 36,91
Trail Making Test		
Subtest A	79	< 94
Subtest B	cnr	<283
Matrix test	51,75	> 31

We formulated a diagnosis of MCI.

The patient refused to perform a lumbar puncture and an amyloid PET, thus we could not formulate a diagnosis of MCI due to AD.

As time passes, the patient's memory impairment assessed through neuropsychological tests was stable.

Second case: A.G.

First visit in 2015: a 57-year-old man with memory impairment, confabulations since the onset and reckless behaviours.

He was convinced that his wife administered him sleeping pills every night in order to spend time with her lover and that his sister stole objects from his house

❖ **Head CT:** normal

❖ **FDG-PET**: wide and moderate hypometabolism in parietal and temporal areas, mainly right, and at the anterior cingulate cortex

❖ **Confabulation Battery**: he answered correctly all the questions
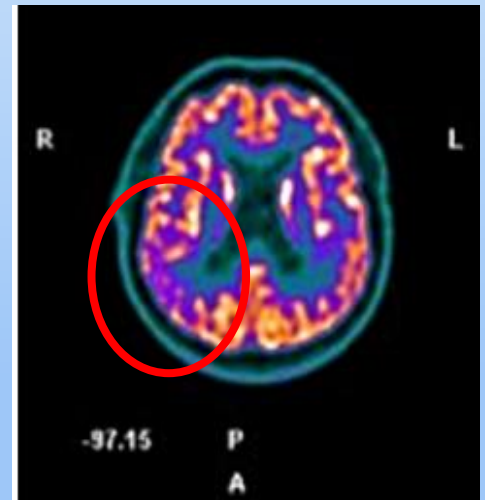
❖ **Neuropsychological assessment**: impairment in executive functions; MMSE was 21.99/30

Test	Score	Cut-off
Verbal memory		
Rey words		
Immediate recall	14,6	<28,53
Delayed recall	0	>4,69
Visuospatial memory		
Cube test	3,75	> 3,5
Rey complex figure copy	27,2	> 23,76
Rey complex figure immediate recall	0,5	> 6,44
Rey complex figure delayed recall	0	> 6,33
Frontal Functions		
FAB	9,5	> 13,5
Clock test		
Spontaneous	11	> 10
Copy	12	> 12
Semantic verbal fluency	19	> 25
Phonemic verbal fluency	24,3	> 17,35
Attention		
Digit symbol substitution test	2	> 5
Stroop Test	108,5	< 36,91
Trail Making Test		
Subtest A	36	< 94
Subtest B	304	<283
B-A	268	<187
Matrix test	32	> 31

The clinical and neuropsychological pattern seemed to be in line with a diagnosis of Frontotemporal dementia, which could also justify the presence of confabulations.

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❖ **Lumbar puncture:** increased levels of Tau protein, normal levels of β42-Amyloid

❖ **Amyloid-PET**: positive

A diagnosis of Alzheimer's disease was posed.
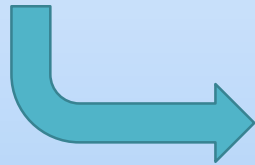
Two atypical cases of memory impairment

- Common element: confabulations at the onset **without a clear impairment of frontal lobes** at imaging

We conducted further analisys:

- Anatomical areas related to confabulations

- Self-awareness

The right hemisphere

Posterior orbitofrontal cortex and the anterior limbic structures (default-mode network)

The defective function of the right hemisphere reduced the inhibitory control over the left hemisphere allows confabulatory explanations to emerge.

The origin of confabulation tendency is not neurodegeneration in a single brain area, but the impairment of complex circuits between different hubs, particularly between the right prefrontal cortex and the mediotemporal regions involved in memory retrieval

Self-awareness and confabulations

Self-consciousness and realty evaluations are regulated by common anatomical areas, involving in particular the default mode network and the right hemisphere; in this view, it has been hypothesized that the lack of insight could act as facilitator for confabulations and delusional thoughts
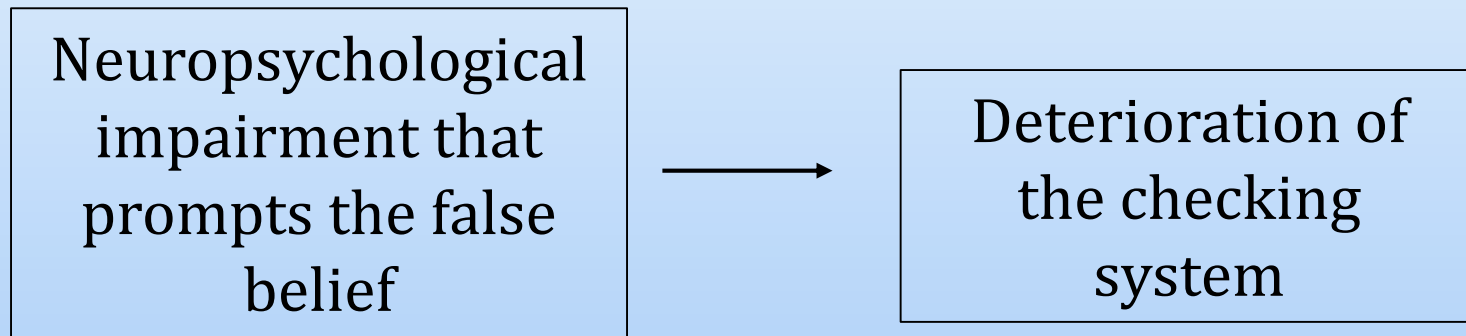
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Our patients represent two atypical case in which this correspondence between disease-awareness and confabulations is not respected.

It would be reasonable to hypothesize that self-awareness and realty interpretation should not be considered as necessarily associated dimensions

Confabulations or delusions?

Two-factors theory

Neuropsychological impairment that prompts the false belief $\longrightarrow$ Deterioration of the checking system

Delusions and confabulations can be considered as two sides of the same coin

Conclusions

Cognitive impairment with atypical presentation

✓ First patient: MCI (due to AD?) without disease-consciousness

✓ Second patient: frontal variant of Alzheimer disease or ovarlap between AD and FTD?

Thanks for your attention