Optic Aphasia, Optic Apraxia, and Loss of Dreaming

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A 47-year-old man with a left temporo-occipital infarct in the area of the posterior cerebral artery is presented. The neuropsychological examination did not reveal aphasia or gross mental deficits. The patient presented with alexia without agraphia, color agnosia, but few visual perceptual deficits. The main impairment was in confrontation naming; he was incapable of naming objects and pictures, not from lack of recognition (excluding visual agnosia) but from lack of access to the appropriate word (optic aphasia). The patient also exhibited a deficit in the evocation of gesture from the visual presentation of an object (optic apraxia) and a difficulty in "conjuring up" visual images of objects (impaired visual imagery) and loss of dreams. The fundamental deficit of this patient is tentatively explained in terms of visuoverbal and visuogestural disconnection and a deficit of mental imagery. © 1985 Academic Press, Inc.

INTRODUCTION

Several papers in the past have distinguished disorders of visual recognition from those of naming (Spreen, Benton, & Van Allen, 1966; Lhermitte & Beauvois, 1973; Assal & Regli, 1980; McCormick & Levine, 1983). The term *optic aphasia*, introduced by Freund (1889), refers to a

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disorder in naming which results neither from visual agnosia nor from aphasia. The disorder in confrontation naming contrasts with otherwise normal language and with a normal or near normal visual perception.

We report a case in part similar to those presented by Lhermitte and Beauvois (1973) and Assal and Regli (1980) which is another illustration of the syndrome of visuoverbal disconnection and adds new data, especially with respect to visuogestural disconnection and a deficit of visual mental imagery.

CASE REPORT

A 47-year-old right-handed male patient (A.R.) with 10 years of education was admitted to the emergency clinic. He had a history of arterial hypertension and, until 6 years ago, alcoholism. Four day before admission on 22 September, 1982, the patient complained of a right hemiparesthesia with minimal loss of strength.

Neurologic Examination

The patient was conscious and cooperative. Eye movements were normal, as were pupillary responses; fundi showed discrete artereosclerotic signs. Cranial nerves were normal. There was a hemihypoesthesia on the right side along with a very slight hemiparesis. A right homonymous hemianopsia was present with no macular sparing. A CT scan revealed the existence of a marked hypodensity at the level of the internal surface of the left temporal lobe with no sign of a mass effect and with no contrast enhancement, corresponding to a left temporo-occipital infarct (see Fig. 1).

Neuropsychological Examination

The following examinations were conducted during the last 2 weeks of November and the first 2 weeks of December 1982.

Speech. Testing revealed normal melody, sentence length, articulation, and grammar. No phonemic paraphasias or neologisms were present, although occasionally some semantic vagueness and rare circumlocutions demonstrated the existence of a very mild word-finding difficulty.

Automatized series (counting, days of the week, and months of the year) were normal, both forward and backward.

The patient exhibited no impairment in the repetition of syllables, groups of two syllables, pseudowords, minimal pairs, polysyllabic words, or sentences [Boston Diagnostic Aphasia Examination (BDAE) maximum score].

The patient exhibited no difficulty in sentence comprehension or logicogrammatical relations (in Luria's sense).

Verbal comprehension, as assessed by the Boston Diagnostic Aphasia Examination, yielded the following scores: word discrimination, 36/72; identification of parts of the body, 20/20; performance of commands, 15/15; and complex material, 5/12. It is worthy of note that the patient's global score is lowered by the slowness of execution in the picture-pointing test, but that he made no error in that test (36/36). If his performance is scored without taking time into account, his global score is within the norm.

The word-discrimination test of the BDAE shows a low score because it is a timed picture-pointing test. The patient did not make errors, but lost a point on each item because of slowness (he lost 36 points). The comprehension subtest of the body-part identification test is also timed but this did not affect the patient since no pictures are involved. The commands subtest was also absolutely normal (but is not a timed test).



FIG. 1. CT scan (1 February, 1983).

Verbal fluency scores were 9 for animal names and 16 for words starting with P in 3 min (lower than the score for our controls of low sociocultural level, which was 21).

Sentence completion tasks and responsive naming tasks were performed completely normally and with short latencies.

Writing. Automatisms and mechanics of writing were normal. No neglect of graphic space was observed, nor was there any impairment of narrative writing. Dictation of letters, words, and sentences was normal. Copy was totally impossible during the first examinations and eventually the patient managed only a servile copy with some small errors.

Reading. In reading letters as well as words and sentences, the patient exhibited a gross impairment. The patient attempted to spell out the words but totally failed. The patient was unable to read the sentences that he had written, as is typical of pure alexia. Reading of numbers was practically preserved (the patient inverted the order in one instance: 127

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was read as 721). If the patient traced the letters with his finger as he read, he was capable of reading the word, but he made several errors with similar letters (e.g., R and A).

Visual perception. The patient performed the Thurstone test of identical forms in 27 min with four errors. The test for neglect (Albert, 1973) was performed quickly and without error. He performed a copy of Type I of the Rey figure in 10 min and scored 32. The average time taken for the reproduction of the Rey complex figure in our group of normal control subjects is 4 min.

Recognition and naming of pictures. In naming 50 pictures the patient gave rapid and correct responses for 37% of the items. The 63% errors consists of 35% delays, 14% circumlocutions, and 6% errors without connection or lack of response. The patient rejected the incorrect names suggested to him.

The following are typical examples of circumlocutory responses.

glass: it is something that you find in bars.

plate: it is something used to eat.

syringe: something that nurses use . . . it's about injections . . . I don't know how to say . . .

balloon: something that children hold and that is full of air.

airplane: I know what this is ... but I don't have the name ... it is something that you find at airports ...

sled: it is something to ski with.

penknife: it is something that you carry in your pocket . . . what is it called?

Recognition and naming of objects. The results of recognition and naming of objects (50 objects) in the visual modality showed the same basic characteristics observed with pictures but with better results: 71.8% correct.

Typical examples of failures to name.

glass: is used to drink.

scissors: something used to cut.

key: it is used to open the door.

fork: it is something to eat with . . . to pick.

button: yes . . . I know . . . by the holes . . . a button.



FIG. 2. The Rey figure produced 1 week after the first examination of the patient's writing.

cigar: it is to smoke.

folder: it is to keep things . . . folder. How did you arrive at the name? By the elastic band and the shape (correct description).

zipper: it is to open and close. . . . What? A dress for example . . . zipper.

Tactual recognition and naming. The patient named all objects placed in either hand quickly and correctly.

Pointing of objects. When asked to point to objects named by the examiner in a multiplechoice test of six items, the patient had only two errors (semantic) and one latency.

Written naming. The task consisted of writing the names of objects presented to him by the examiner and was normal (25/25).

Grouping by category. The patient was required to group the objects presented into categories previously stipulated by the examiner. The patient made many errors, all of which were explainable by word-finding difficulties. The groupings performed were of the functional type. (Examples: scissors with clothes; men of different races were classified by their clothes; train was included in sea transport; and egg was included with fruits.)

Association of pictures of items of the same category but of different shapes was normal (25/25).

Gestural praxis. The patient was capable of imitating, with the right as well as the left hand, all of the arbitrary positions of the Bergès and Lezine (1981) test. There was no difficulty in performing verbal commands, symbolic gestures (military salute, threat, etc.), mimicry of the use of objects (hammer, saw, etc.), or use of real objects (a candle and a box of matches, etc.). However, when an object was presented and the patient was asked to perform the gesture corresponding to the use of the object—without touching the object the patient manifested the same problems as before: if he could not find the word, he was incapable of performing the pantomime (e.g., scissors, spoon, glass, syringe, bicycle).

During the examination of picture and object naming the same phenomenon was repeatedly observed: The patient was unable to perform the pantomime of the use of the object if he could not correctly name the object. If, after a while, through circumlocutions, he managed to recall the name (but not during the period of circumlocutions) he performed the gesture correctly. If the patient retrieved the wrong name (which occurred in two cases) the gesture performed corresponded to the (wrong) word retrieved (e.g., when presented a fork, and he said it was a spoon, he performed the gesture corresponding to the use of a spoon).

Face recognition. The patient was capable of recognizing photographs of current celebrities of political life, artists, etc., but showed a clear difficulty in evoking the names of the celebrities presented. He was capable of saying whether the face was that of a singer or whether he saw him/her on television or if it was a known actress from Hollywood. To a picture of the King of Spain he said: Right! it is the master of all ... the king ... (pause) His name is ... Juan. Brigitte Bardot: a movie star ... J. Manuel Serrat: a Catalan singer. The patient was also capable of picking out the faces of famous people among others.

Constructional praxis. There were no significant defects in copy with single figures (circle, square, triangle) or with more complex figures (daisy in a flower pot, and a small house). In drawing to verbal command there was slowness of performance and in several items a defect of evocation of mental visual imagery was apparent. The patient produced a verbalization and a successive description of the characteriestics of the objects. He explained his own defects as follows: "I can draw the object quickly only if I have the image when I am given the name." (Examples. for *elephant:* "I don't know what it is ... it is the one with the trunk, right? ... I don't know if he has a tail ...; *palm tree:* It's a tree ... but no ... now I don't know what it is like ...; *have you seen some*? yes, there are many ... in Alicante.)

Results on Bender's gestalt visuomotor test showed only one inversion in the first figure and a predominance of macrographia. *Recognition and naming of noises.* He did not exhibit any difficulty with the presented items except when he had to match a sound with a picture in a multiple-choice format.

Somatognosia and right-left identification. No deficit was observed. The patient was capable of performing quickly and correctly the items of the BDAE which involve parts of the body, digital gnosis, and right-left orientation.

Colors. Color matching was normal. Performance on the Farnsworth test was normal. Naming and pointing to colors showed clear deficits, constituting a color-naming defect. The patient exhibited no difficulty in verboverbal associations involving colors (i.e., telling the characteristic color of objects). In these tasks, responses were always quick and correct (35/35).

Memory. The patient obtained an MQ of 77 on the Wechsler memory scale (WMS). His scores on the WMS subtests were as follows: personal and current, 5/6; orientation, 5/5; mental control, 8/9; logical memory, 1/23; digits, 8/17; visual reproduction, 9/15; and associative learning, 7/21. The reproduction of the Rey complex figure from memory was 18/36.

Intelligence. Scores on the Wechsler Adult Intelligence Scale (WAIS) were as follows: verbal IQ 103; performance IQ 79; and full scale IQ 96. His low achievement on the performance tasks were attributable to the figure completion and object assembly subtests on which performance was very low.

Raven's progressive matrices, [Series A and B (color)]. The result was 28/36.

Concrete and abstract words. The patient easily understood the meaning of very abstract words (such as those in the vocabulary of the WAIS) but had difficulties when he referred to concrete words pertaining to animals or to various items that call for concrete visual images. Also, he could say that an elephant is an animal and that it is in the zoo, but he had great difficulties when he had to describe the inherent characteristics of the animal (it is big, has a trunk, a short tail, tusks, etc.). This contrastive phenomenon between the concrete and the abstract represents a *leitmotiv* in all tasks. He was able to tell that a rose and a carnation are flowers and that in Catalonia roses are offered on Saint Georges' day, but it was very difficult for him to say what a rose looks like or what a carnation looks like.

Dreams. The patient reported having had dreams almost every night before his illness but no more since. Five months later, when naming was better, he reported having had one dream, but no more since.

DISCUSSION

The patient presented with a deficit centered around the retrieval of names of objects presented in the visual modality (producing circumlocutions and pauses), a deficit in the evocation of the gesture appropriate to the use of objects when also presented in the visual modality, and a deficit in the evocation of mental images of objects. The deficit in the evocation of gesture was similar to the case described by Assal and Regli (1980) and represents a form of visuogestural disconnection (called optic apraxia by these authors). The patient was incapable of going from the image of the object to the "gesteme," defined by Signoret and North (1979) as the mental representation of the gesture, and which also corresponds to "the overall memory image of the gesture" mentioned by De Renzi, Faglioni, and Sargato (1982). These deficits represent a modalityspecific apraxia (in this case a disconnection apraxia).

To satisfy the criteria for optic aphasia, the patient fulfilled among other things, the following requisites: absence of spatial neglect and correct copy, and discrimination of drawings (Bender's tests, Rey's test, and copy of classic items of constructional praxis: house, daisy in flower pot, etc.) The perceptual and graphoperceptual capacity was also better than in the case reported in 1973 by Lhermitte and Beauvois (4 errors in 27 min in our case as compared with 13 errors in 30 min in the case of these authors in Thurstone's test of identical forms; Type I recall of the Rey figure as compared with Type IV in the case of these authors).

The patient's global intellectual capacity was preserved and his IQ was not far from that of patients with optic aphasia or visual agnosia in which a minimal intellectual level is required (Albert, Reches, & Silverberg, 1975: Hécaen, Goldblum, Masure, & Ramier, 1974; Rubens & Benson, 1971). The WAIS showed lower performances in the subtests in which elements of previously known visual images play an important role (picture completion and object assembly).

Furthermore, the patient shows a pure alexia as well as a color-naming deficit. This combination of symptoms may be related to a lesion in the mesial temporo-occipital junction of the left hemisphere, as Damasio and Damasio (1983) have recently discussed.

The deficit in word recall in confrontation naming characterized by delay and circumlocutions, as well as absence of pharaphasias, makes it similar to amnesic aphasia as described by Lecours and Lhermitte (1979, p. 141). In our case, however, this deficit contrasts with the quick and correct naming upon tactile presentation and quick and correct naming in sentence completion tasks or in responsive naming (verboverbal) tasks. The deficit in naming faces constitutes what we call "prosopanomia" and is similar to the case reported by Assal and Regli (1980). This clinical manifestation is evidently different from that observed in true prosopagnosia. The phenomenon of prosopagnosia "appears in relation to any visually 'ambiguous' stimulus whose recognition depends on contextual memory evocation" (Damasio, Damasio, & Van Hoesen, 1982).

The memory deficit exhibited by the patient remained centered around the more demanding verbal tasks of the WMS (logical memory and associative learning). The dissociation between visuospatial and visuographic memory (visual reproduction of the WMS and the Rey figure) could be related to the focal left-hemisphere lesion.

The deficit in performance with concrete words as opposed to abstract words may be related to the visualizable-verbalizable dichotomy and relates to the problem expressed by Warrington (1979) when she speaks of the "fine grain semantic details" of the semantic memory (the patient loses the concrete—the visualizable—and retains the abstract—the verbalizable). This case report gives support to the multidimensionality of semantic memory and points to the loss or delayed accessibility to the visual components of this semantic memory store. The patient exhibited a difficulty in accessing language from visual information (optic aphasia or optic anomia) and exhibited, as well, a difficulty in evoking the image (revisualization or reminiscence) from verbal stimuli. The case report of Cambier, Masson, Elghozi, Henin, and Viader (1980) stresses the importance of the posterior inferotemporal cortex in the *construction of the visual object* and shows that, between a normal elemental visual perception and normal language, a pathological process is interposed (agnosia or, in our case, a disconnection).

The patient also reported a lack of dreams, which, if substantiated, would represent the Charcot-Wilbrand syndrome, defined by Critchley (1953) as "the symptom whereby a patient loses the power to conjure up visual images or memories and, furthermore, ceases to dream his sleeping hours." This deficit brings further support to the idea of a deficit in the function of the so-called "mental images." Lyman, Kwan, and Chao (1938) similarly reported the case of a patient who complained of difficulties in visualizing things (he was unable to draw a chair without seeing one) and claimed he had no more dreams since his illness. More recently, Deleval, De Mol, and Noterman (1983) reported a case of loss of mental imagery and reviewed 35 cases previously reported in the literature. The authors do not think that their case presents a disconnection between the visual and language areas. Yet, like ours, their patient shows confrontation naming difficulties. Cases of facilitation on presentation of first phoneme clearly indicate a word-finding difficulty, not a difficulty in recognizing the objects.

Gainotti, Silveri, Villa, and Caltagirone (1983) discuss drawing objects from memory in aphasia. Among other things they found that there was a significant correlation between impaired drawing from memory and disruption at the semantic-lexical level of language integration.

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