

Persisting Language Deficit and the Minor
Broca Syndrome: A Case Report
(Abstract)

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Through a review of a series of autopsied cases reported since 1820, and administration of language assessments at bedside, Mohr (1976) and his colleagues (Mohr *et al.*, 1978) have attempted to delineate the contribution of lesions in Broca's area to specific, persisting impairments of speech and language. They concluded that patients with Broca's area infarction exhibit initial mutism, disturbances in syntax, and impairments in writing, all of which resolve quickly to leave only mild articulatory impairments (Mohr, 1976). This resolving cluster of symptoms associated with Broca's area infarction has been identified as the "minor Broca syndrome." Recently, Mohr (1980) has claimed that persistent language difficulties appear to be "so rare as to be considered an exception to the rule" in these cases. Mohr's conclusions are weakened, however, by two major factors. First, the assessment procedures described were probably not complex enough to detect mild residual language impairments in the chronic state. Secondly, communication recovery was often discussed in nonspecific terms, with emphasis on verbal language behavior to the neglect of other modalities.

This study presented the case of a 47 year old male with circumscribed infarction of Broca's area, whose language in the first few days post onset resembled the "minor Broca syndrome." Speech and language characteristics were evaluated in depth in all language modalities, at a point sufficiently distant from onset (ten months) to elicit any impairments that could be considered persistent (see Table 1).

Results indicated that this patient made few errors on commonly used assessments of aphasic involvement. On more complex linguistic tasks, however, he exhibited qualitative and quantitative differences from three normal individuals selected as educational and occupational controls (see Table 2).

Our findings suggested that with Broca's area infarction a mild language impairment may persist and accompany motor speech disturbance. Clinically these results indicate the importance of following such patients carefully over time. We cannot assume that their language impairments will resolve completely. Indeed, some of these patients will be left with the special problems of the mildly communicatively impaired, and may profit from techniques directed towards improving subtle language deficiencies, such as those recently described by Darley, Helm, Holland, and Linebaugh (1980).

Table 1. Summary of tasks administered to patient DK at 10 months post CVA, and to three educational/occupational controls.

TEST	DESCRIPTION
<u>Auditory Comprehension Test for Sentences (ACTS)</u> , Shewan (1980)	21 sentences varying in parameters of length, vocabulary difficulty, and syntactic complexity are verbally presented. The subject points to one of four pictures which is described by each sentence.
Sentence Correction Tests, Bayles (1979)	39 sentences are verbally presented, containing a variety of phonologic, semantic, and syntactic errors. The subject indicates whether each is correct or incorrect, and repeats each after making appropriate changes.
Comprehension of linguistic concepts requiring logical operations, Wiig and Semel (1973)	15 sentences are displayed representing 1) comparative relationships, 2) passive constructions, 3) relationships between sequential events, 4) spatial relationships and 5) familial relationships. The subject silently reads each sentence and verbally responds to a question about each one.
Critical reading at the sentence level, Gardner, Denes and Zurif (1975)	Subject is given 12 sentences which include a variety of semantic and syntactic errors. Subject marks the appropriate corrections with a pencil.
<u>Northwestern Syntax Screening Test</u> , NSST writing, Lee (1969)	14 paired pictures are presented and subject writes a complete sentence about each.
"Cookie Theft" picture, Goodglass and Kaplan (1972)	The "Cookie Theft" picture is presented and subject is asked to write a short paragraph describing what is happening in the picture.
Story Completion Test, Gleason, Goodglass, Green, Ackerman, Hyde (1975)	14 brief story-like introductions designed to elicit specific responses containing a variety of grammatical constructions are spoken by the examiner. The subject gives a verbal response.
Rey Auditory-Verbal Learning Test, Lezak (1976)	A list of 15 nouns is verbally presented on five separate trials. Subject repeats as many words as can be remembered following each trial.
<u>Coloured Progressive Matrices Raven</u> (1972)	36 colored patterns with a section missing from each are presented to the subject who selects the correct missing piece from six choices.

Table 2. Performance of patient DK and three control subjects on a battery of higher level tasks.

TEST	DK	SUBJECTS		
		DS	Controls NH	OW
<u>ACTS</u>	18/21	19/21	21/21	18/21
<u>Sentence Correction Test</u>	37/39	38/39	39/39	39/39
<u>Logical Operations</u>	9/15	13/15	15/15	14/15
<u>Critical Reading</u>	11/12	12/12	12/12	12/12
<u>NSST Writing</u>	12/14	14/14	14/14	11/14
<u>"Cookie Theft" Picture</u> (written sample)	Woman standing in water. Sink overflowing. Faucets over running. Girl asking for cookies from boy. Stool tipping.	The children were taking cookies when the stool fell over. But their mother doesn't even see that because her sink is running over.	Mother is in trouble. The children are raiding the cookie jar and it looks like her son is in for a tumble, meanwhile, her sink is overflowing.	The boy fell off the stool while getting cookies. The sink overflowed while the woman was washing dishes.
<u>Story Completion Test</u>	13/14	14/14	14/14	14/14
<u>Rey Auditory-Verbal Learning Test</u>				
Trial 1	6	6	6	6
Trial 2	9	9	12	8
Trial 3	8	11	15	12
<u>Colored Progressive Matrices</u>	32/36	33/36	36/36	36/36

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DISCUSSION

Q: In Andy Kertesz's new book on aphasia he presents some additional evidence that might cause Mohr some problems. Does anybody remember when Mohr did the initial diagnosing of these aphasics with the large lesions who had the true syndrome of Broca's aphasia?

A: No, but that was a problem with the Minor Broca cases. Out of the 22 cases that Mohr looked at himself, fewer than half were seen after 6 months post onset.

Comment: With regard to some of the testing procedures Mohr used at bedside, those procedures are really essential at that point in the patient's recovery because they are in the range that those patients are in. But it's important to extend the difficulty level of these tasks as patients improve.

Q: Is Broca's area losing credibility?

A: The controversy appears to be "In what ways is Broca's area important to speech and language? Is it only a center for motor programming?" The results in this case would suggest that it is not just that.

Q: Do you think your tasks were tapping high level aphasia?

A: This level of activity may be sensitive to brain damage in general. We would describe our patient as mildly communicatively impaired.

Q: In Kertesz (1979) they called patients whose lesions looked like yours "Acute Broca's," and one year out those same patients who had recovered were called anomic. Would you say your patient was anomic?

A: No, I wouldn't say he was anomic. In fact, the morphosyntactic errors he exhibited in all modalities seemed to be like those you might see with full blown Broca's aphasia. We wished we'd had more errors to analyze, because it's interesting to speculate whether this syndrome is different from Broca's aphasia, or whether it is a less severe form.

Comment: In Naeser et al. (1980) they mapped the geometric centers of the lesions across a large number of patients. They used the Boston criteria for classifying their patients as Broca's, and found good agreement that the center of the lesions producing that syndrome did have some aspect of the third frontal convolution involved, as indicated by CT scan.