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TRANSCORTICAL SENSORY APHASIA WITH PRESERVED SPONTANEOUS SPEECH AND NAMING - A CASE STUDY

Mile Vukovic, Gordana Ocic

Abstract: The basic features of transcortical sensory aphasia are disturbance of auditive understanding of speech, anomia and preserved ability of repeating language stimuli. Spontaneous speech of patients with this aphasia is fluent, para phasic and semantically scarce. In this paper we report a case of a 57 year old patient, right-handed with a lesion of the temporo-parietal part of the left hemisphere whose aphasia differed from classical form of transcortical sensory aphasia in preserved naming and semantically coherent speech. It has been assumed that this type of aphasia results from dissociation between phonologic and semantic processing of linguistic symbols, where the phonemic-phonologic processes are preserved, while the approach from the receptive lexicon to semantic system is affected, i.e. areas responsible for semantic processing to linguistic information.

Introduction

The basic symptoms of transcortical aphasia have been accentuated in Lichtheim's (1885) description of two patients out of whom only one had fluent speech, impaired comprehension and preserved ability of repetition, while the other had nonfluent speech, intact comprehension and repetition of lingual stimuli.¹ Thus, the presence

of two types of aphasia described in modern taxonomy as transcortical sensory and transcortical motor aphasia have been suggested.^{2,3} Transcortical sensory aphasia is characterized with fluent and paraphasic speech, impaired comprehension and naming, intact repetition. Transcortical motor aphasia, however, is characterized with lower speech fluency, preserved repetition and naming.⁴ Geschwind (1968) described a third type of transcortical aphasia, known as syndrome of isolation of speech area or transcortical mixed aphasia,⁵ which is recognized by absence of spontaneous speech, severe comprehension disorder and relatively preserved repetition with echolalic form of verbal behavior.

Anatomic basis of these aphasic syndromes is mainly defined. Focal lesion in transcortical sensory aphasia is most commonly localized in temporo-parietal region of the left hemisphere, behind Wernicke's area, i.e. in the irrigation area of the medial and posterior cerebral artery.⁶ Symptoms of transcortical aphasia are encountered even in cases of left thalamic lesions, as well as in the second and third stages of Alzheimer's disease.⁴ Transcortical motor aphasia usually takes place in lesions of prefrontal regions of the brain, in front and behind the Brokin's area.⁷ Transcortical mixed aphasia occurs as a consequence of severe brain disorders leading to isolation of speech area from the other parts of the cortex. The lesion affects parts of the cortex surrounding the main speech regions (Brokin's area, Wernicke's area and fasciculus arcuatus which connects these two areas). This type of aphasia is mainly encountered in cases of the occlusion of the left internal carotid artery in conditions of prolonged hypoxia or severe cerebral edema.⁷

In addition to these basic types of transcortical aphasia, two more have also been identified: (1) transcortical mixed aphasia with intact naming⁸ and (2) transcortical sensory aphasia with relatively preserved spontaneous speech and naming.⁹ The pathological basis of these forms of transcortical aphasia has not need elucidated, but attempts have been made to explain the mechanism of occurrence. Dissociation between phonologic and semantic processes has been suggested.

Case study

Patient B.Z., age 57, right-handed, retired telephone technician, was admitted to the Institute of Neurology Clinical Center of Serbia on March 18th 1996 for abrupt onset of disturbance of speech, reading and writing associated with mild weakness of the right extremities. Myocardial infarction preceded these disorders. On admission the patient was conscious, oriented in time, place and to persons. Neurological examination revealed mild hemiparesis with hemihyperesthesia of the left side of the body and aphasia with marked disorder of speech comprehension. Defects in the visual field have not been detected.

EEG findings revealed mild dysrhythmia in the anterior parts of the temporal regions during hyperventilation. Brain scintigraphy revealed a large hyperactive focus with infarct-like properties in the fronto-parietal region of the left hemisphere. Magnetic resonance imaging (MRI) confirmed the presence of hemorrhagic infarction in the temporo-parietal part of the left hemisphere (Figure 1).

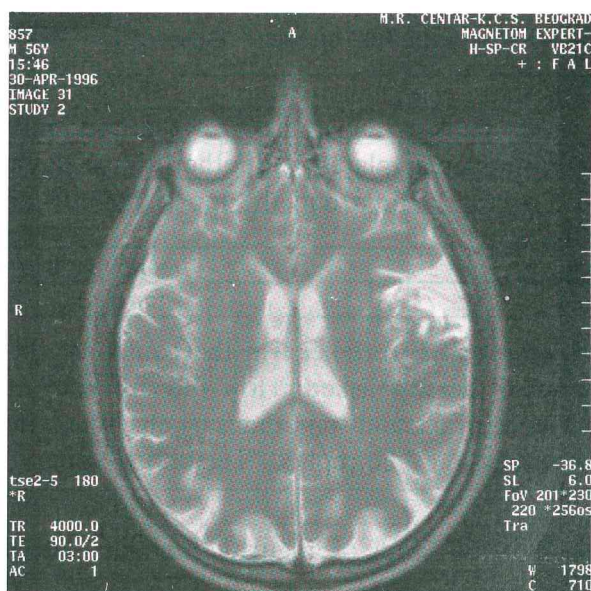


Figure 1. MR image evidenced hemorrhagic infarction in the temporo-parietal region of the left hemisphere

Immediately upon admission the patient was subjected to neuropsychological investigation. Boston diagnostic test for aphasia (BDAE),² Boston naming test (BNT)¹⁰, Token test (TT), Rey's test of verbal learning,¹² Rey-Osterreith's complex figure^{12,13} and standard Raven's progressive matrix were used.

Results

The sample of spontaneous speech obtained during his description of the BDAE picture "kitchen theft" and according to in interview it was noted that B.Z. had fluent speech with preserved prosody, articulation and syntax. He did not have problems in speech initiation, nor he showed signs of logorrhea. Phonologic deficits were not noted, but lexical disorders in the form of verbal paraphasia have occurred. Thus, while describing the picture "Kitchen theft" the patient used the word "bed" instead of "chair" and the word "laundry" instead of "dishes" (see the sample of spontaneous speech). He did not appear to have special difficulties in finding lexical units.

Sample of spontaneous speech: Description of the picture "Kitchen theft"

A boy takes cookies and falls from the bed. It is like in a kitchen here. Some pots, plates and other things lay around. A woman is washing the laundry and the tap is not off, and water is flowing over the sink.

Verbal paraphrases were seen in the course of the interview. For example, when he was asked "How old are you?" the patient would sometimes reply 63, and sometimes 64 etc. When he was asked "What is your profession?" he replied "Telephone apparatus" instead of technician.

The results of the study of linguistic functions are given in Table 1. BDAE:

Table 1. The results of the study of linguistic functions (BDAE, BNT, TT).

TESTS AND SUBTESTS	ACHIEVEMENT/ MAXIMUM SCORE
BDAE:	
2. AUDITIVE COMPREHENSION	
Words	62/72
Parts of the body	15/20
Commands	5/15
Complex ideation material	2/12
ORAL SKILLS	
Nonverbal	10/12
Verbal	14/14
Verbal automatism	7/8
REPETITION	
Words	10/10
Sentences (high probability)	8/8
Sentences (low probability)	6/8
NAMING	
Induced by pictures	114/114
Induced by questions	27/30
Animal naming	16/18
READING ALOUD	
Words	5/10
Sentences	1/10
Understanding of written language	
Symbols and words	8/10
Recognition of words	9/10
Reading aloud	3/8
Matching words and pictures	5/10
Sentences and paragraphs	2/10
WRITING	
Evaluation of writing mechanism	5/5
Symbols	37/51
Dictation on the primary level	10/15
Dictation of words	1/10
Dictation of sentences	0/12
Written naming	3/10
Narrative writing	1/5
BNT	54/60
TT	21/62

Analysis of the obtained results suggested that B.Z. had a marked disorder of auditive comprehension that was manifested already on the level of comprehension of certain lexical units. The disorder was particularly obvious during execution of verbal commands and comprehension of ideation material. The low TT score (21 out of 62 points) also suggests severe deficit of speech comprehension (Table 1).

Repetitive speech was almost completely preserved in our patient. He successfully repeated all words and 14 out of 16 sentences from BDAE (Table 1). Rare mistakes occurred only when he was repeating complex sentences containing rare words. Eg. He repeated the sentence "The Chinese fan had a beautiful emerald" like "The Chinese fan had a beautiful eremalt".

On BDAE naming subtests he achieved almost the maximum score, and on BNT he successfully named 54 out of 60 presented items (Table 1). These findings, as well as absence of difficulties in evoking content words in spontaneous speech suggest the possibility of preserved naming function in our patient.

In addition to disturbed comprehension, B.Z. had markedly deficient reading and writing. He successfully read 5 out of 10 words, and only 1 out of 10 sentences from BDAE. Apart from the difficulties in oral reading, he encountered difficulties in understanding of the written text, which was evidenced on the subtest of matching words with pictures and the subtest of sentences and paragraphs (Table 1). In order to analyze his reading function more thoroughly we conducted additional testing with a list of words composed of 20 nouns with concrete meaning, 20 abstract nouns, 20 functional words and 20 no-words. The test was conducted after partial recovery of the reading and writing functions.

The results are presented in Table 2.

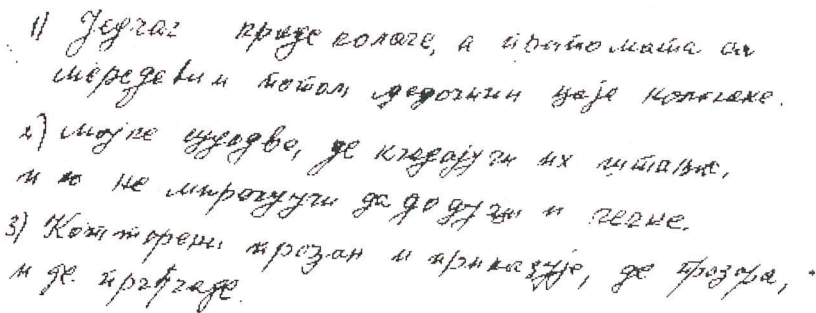
Table 2. Results of reading the word list

Types of words	Achievement/Maximum score
1. Concrete nouns	19/20
2. Abstract nouns	16/20
3. Functional words	14/20
4. No-words	5/20

The table shows that the patient read the no-words much worse than other types of words. He showed a tendency to give some meaning to the no-words, i.e. translating them to words with meaning, eg. "calass" like "Class", or "byzone" like "bygone", or "ouflok" like "outlook", etc. B.Z. achieved somewhat lower score on reading abstract than concrete nouns, and also read worse functional words than nouns. His reading errors were manifested like visual and semantic paralexia.

Evaluation of writing function revealed that the patient preserved the premorbid graphomotor pattern, which can be seen in the sample of his written speech (Figure 2). He could write individual letters and numbers, his name, address, phone number. Also B.Z had problems in writing dictation and independent narrative writing. From the sample of the written speech severe dysgraphia is obvious manifested in exchange of graphemes, addition of letters and syllables in words, which completely destroyed the word structure, to neologisms (Figure 2). For further analysis of writing we used the same word list which we previously used in evaluation of his reading ability.

The results are given in Table 3.



1) Једнак краје воларе, а ивнито мања са
шерегети и појом дедолин ваје колеле.

2) Моје сујаво, је крајузи их милаво,
и се не марајузи се дојузи и релне.

3) Компрени трзан и ринкојфе, се прозаја,
и се иррфаје.

Figure 2. Sample of written speech
(description of "Kitchen theft" picture)

Table 3. Results of writing the same word (dictation)

Type of word	Achievement/Maximum score
1. Concrete nouns	14/20
2. Abstract nouns	11/20
3. Functional word	10/20
4. Non-words	1/20

The obtained results show that the patient had marked difficulties in writing non-words. He wrote only 1 out of 20 non-words. He was more successful in writing concrete than abstract words on one hand, and nouns than functional words, on the other. In written speech visual errors were predominant.

These writing and reading errors reflect elements of deep dyslexia¹⁵ and deep dysgraphia.¹⁶

In addition to these linguistic disorders, our patient had a verbal memory disorder, which was shown in a lower achievement in evoking (total score out of 5 attempts: 27) and recognition (score 10) of the list of Rey's score of verbal learning. Also, he manifested a mild fall of nonverbal memory, which was manifested in evoking Rey-Ostereith's complex figure (score 18.5). On the basis of copying the Rey's figure, it can be said that the patients suffered from discrete constructive apraxia manifested in erroneous recognition of certain detail, which is characteristic of the left sided brain lesion (Figure 3). The total score in copying the figure was 31.5. The overall intellectual capacities, measured by Raven's progressive matrix were within the average (score 36).

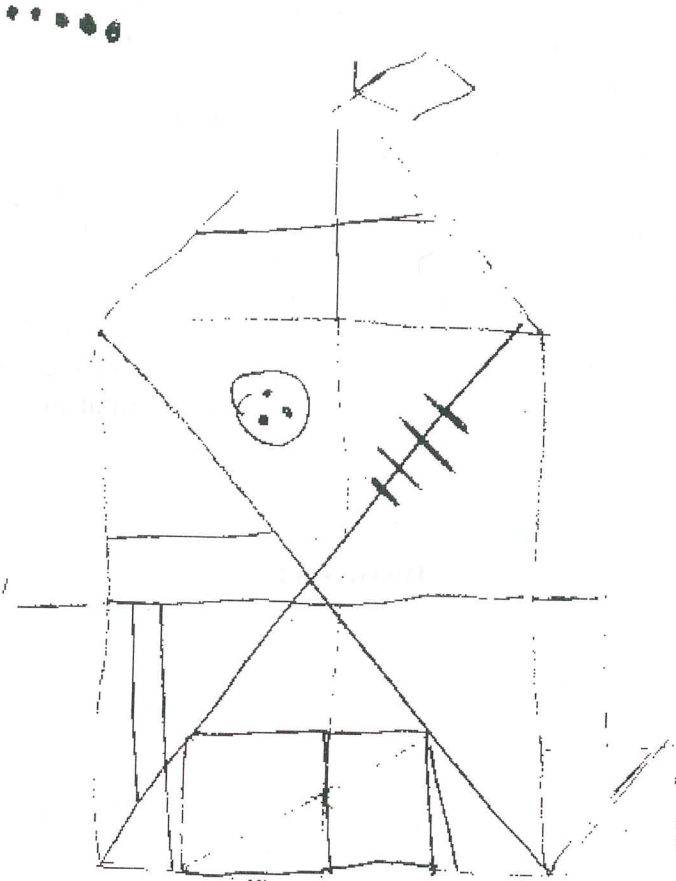


Figure 3. Rey-Ostereith's complex figure

In the course of a month long hospitalization the patient was subjected to rehabilitation of the defective functions in addition to medical therapy. Two months after the discharge his linguistic functions were re-tested, and aphasia was substantially recorded. However, the patient still had problems in performing correctly multiple commands. Occasionally, verbal paraphasia occurred during conversational speech, mainly related to his age which can be illustrated by the following example: when asked about his age the patient replied: 67, soon to be 68, instead 57, i.e. 58. And he was not aware of the mistake. In spontaneous speech (description of the picture "Kitchen theft" he did not manifest phonologic, lexical or syntactic disorders.

Evaluation of reading and writing capacity revealed substantial degree of recovery of these functions. The reading errors mainly occurred in multisyllabic words, in the form of phoneme exchange. He failed to manifest special problems in comprehension of the meaning of the written text from BDAE, but he did encounter troubles in comprehension of longer texts, which was noted during reading articles from the daily press. However, the patient insisted that he understood the content of the written text in spite of the difficulties manifested on the way. The writing errors were manifested in the form of grapheme changing places. The patient still had great problems in reading and writing non-words. In spite of recovery of the linguistic capacities, substantial improvement was seen in verbal memory, as well.

Discussion

Dissociation between certain modalities of the lexical function (spontaneous speech, comprehension, naming and repetition) is one of the basic criteria for clinical classification of aphasic patients. For example, in Brokin's and transcortical aphasia much better capacity of auditive comprehension in relation to spontaneous speech was seen. In anomic aphasia dissociation between naming on one hand, and comprehension and repetition on the other is seen, where patients with this aphasia have defective naming, and relatively good comprehension and repetition of speech. In conductive aphasia, disproportionately severe disorder of repetition in comparison with preserved speech fluency and almost completely preserved comprehension were recorded. The reported patient had an unusual presentation of aphasia manifested in fluent spontaneous speech and preserved naming, and marked defects in comprehension, reading and writing. The manifestation of aphasia apparently resembles several known syndromes such as Wernicke's aphasia, pure deafness for words and transcortical sensory aphasia.

In the manifestations of fluent speech, defective comprehension, dyslexia and dysgraphia, the clinical picture of the lexical disorders in our patient resembles the syndrome of Wernicke's aphasia.

However, contrary to patients with this type of aphasia with marked defects of repetition and naming, in our patient these speech modalities were completely preserved.

Better capacity of spontaneous speech and naming in comparison with auditive understanding makes our patient quite alike the pure syndrome of deafness for words. However, patients with this syndrome are not able to repeat the speech stimuli, which is quite different from manifestations in this patient, who not only successfully repeated words and sentences, but expressed an echolalic form of verbal behavior. Echolalia was particularly obvious during testing of auditive comprehension where the patient directly repeated the given command after the investigator. The second difference is manifested in the fact that patients with pure deafness for words have preserved capacity of reading and writing, and are able to communicate with the surroundings. Conversely, our patient had severely defective visual modalities of the linguistic function.

From the clinical aspect, the linguistic disorders in our patient mostly resemble transcortical sensory aphasia. However, contrary to patients with this type of aphasia with fluent, but empty speech,⁴ B.Z. did not encounter problems in evoking words with meaning. Absence of circumlocution, rare usage of semantically empty words, like "some", "so to say", etc. and rare production of verbal paraphrases makes the speech of this patient quite correct in lexical and semantic senses. Besides, B.Z. had completely preserved naming, while anomia is one of the central symptoms of transcortical sensory aphasia.

Analysis of characteristics of aphasia in our patient in the light of well defined aphasic syndromes, we concluded that this was the case of a specific form of transcortical sensory aphasia described by Heilman et al. (1981) as transcortical sensory aphasia with relatively preserved spontaneous speech and naming.⁹ The difference between the patient described by these authors and our patient is in the fact that our patient did not manifest his dyslexia only in reading of non-words, but in reading of meaningful material, as well. The second important difference was in the fact that severe dysgraphia of B.Z. reflected defect of linguistic aspect of writing, while in the Heilman's patient writing defects were related to ideomotor apraxia. Conversely, our patient had elements of ideomotor apraxia.

Transcortical sensory aphasia with preserved spontaneous speech and naming has been reported quite rarely in referential literature. Therefore, the mechanism of occurrence of this aphasia has been insufficiently understood. It appears that interpretation of the clinical picture of this aphasia can be supported by the hypothesis of functional organization of the lexical system,^{17,18} according to which knowledge of lexical forms is represented in autonomous, modal-specific components, particularly for processing on the afferent and efferent levels. This hypothesis marks the difference between the phonologic entry input and output lexicon, as well as between the orthographic input and output lexicons. The input and output lexicons are related to the semantic component¹⁹ which is illustrated in Figure 4.

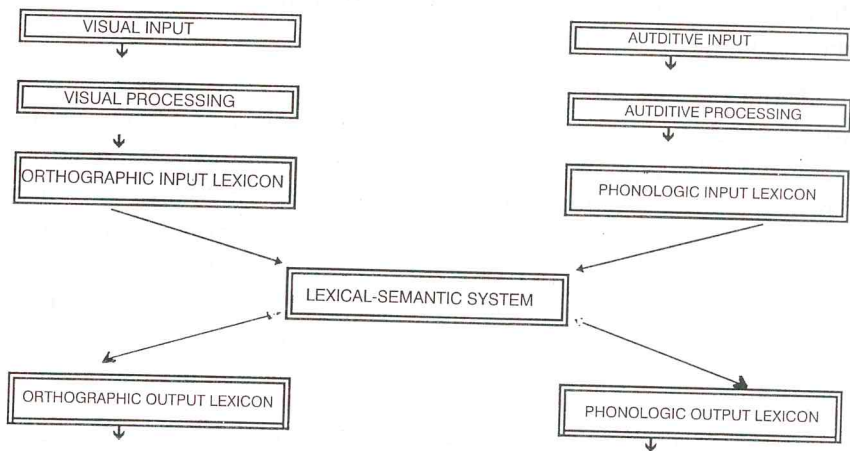


Figure 4. Scheme of lexical system

The preserved ability to evoke words with meaning during spontaneous speech and successful naming of objects supports the fact that patients with transcortical sensory aphasia with preserved spontaneous speech and naming have a preserved approach from the lexical-semantic system to phonologic output lexicon, which makes it possible for them to successfully communicate their ideas and thoughts and name the presented stimuli. On the other hand, discontinued links between the phonologic input lexicon and lexical-

semantic system prevent approach of this lexicon to the regions responsible for semantic processing of concepts, inducing disorders in understanding of written speech. Simultaneously, we assume that disorders of written speech in our patient are induced by discontinued communication between the lexical-semantic system and orthographic output lexicon. Namely, according to the character of errors in the written speech, it appears that B.Z. did not have any problems in finding lexical units, but he manifested problems in their orthographic realization.

Assuming that the defect of central lexical-semantic system induces lexical disorders in all modalities of the lexical function,¹⁹ it may be assumed that the lexical disorders of our patient were not induced a defect on the level of central lexical-semantic system, but discontinuation of the links between this system and its segments.

Although anatomic localization of semantic processes can hardly be defined, it has been assumed that semantic processing of linguistic information takes place on the level of the parietal lobe.^{20,21} Since B.Z. has a focal brain lesion in the temporo-parietal region of the left hemisphere, it has been assumed that this lesion prevented transfer of information from the Wernicke's area to the regions responsible for semantic functions, preventing comprehension of the received messages. The marked signs of dyslexia and dysgraphia show that the lesions probably affect gyrus angularis, since the reading and writing disorders are usually related to lesions of this part of the cortex. Therefore, it is possible that transcortical sensory aphasia with preserved spontaneous speech and naming results from focal lesions of the auditive associative cortex and gyrus angularis, sparing Wernicke's area and its links with the Heschl's gyrus.

In patients with transcortical sensory aphasia with maintained spontaneous speech and naming, linguistic functions are fairly rapidly recovered, while subtle disorders which may be detected only with specialized aphasiologic studies tend to persist. Most probably, this is the reason why this type of aphasia is so rarely diagnosed in practice. However, the presence of this type of aphasia as a special clinical entity and understanding of its mechanisms of occurrence is very important for contemporary theory and practice.

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stimulusa.¹ Time je ukazano na postojanje dva specifična tipa afazije koja su u savremenoj taksonomiji označena kao transkortikalna senzorna i transkortikalna motorna afazija.^{2,3} Transkortikalna senzorna afazija se prepoznaje po fluentnom i parafazičnom govoru, oštećenom razumevanju i imenovanju, intaktnoj repeticiji, a transkortikalna motorna afazija po sniženoj fluentnosti govora, očuvanoj repeticiji i nominaciji.⁴ Geschwind (1968) je opisao i treći tip transkortikalne afazije, poznat kao sindrom izolacije govorne aree ili transkortikalne mešovite afazije,⁵ koja se prepoznaje po odsustvu spontanog govora, teškom poremećaju razumevanja i relativno očuvanoj repeticiji sa eholaličnim oblikom verbalnog ponašanja.

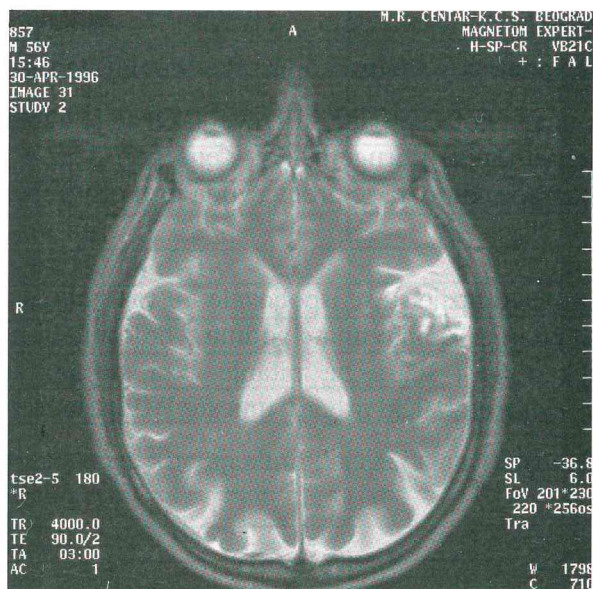
Anatomska osnova ovih afazičnih sindroma je, uglavnom, poznata. Fokalna lezija kod transkortikalne senzorne afazije najčešće je lokalizovana u temporo-parijetalnom regionu leve hemisfere, iza Wernickeove aree, tj. u irigacionom području susticanja srednje i zadnje moždane arterije.⁶ Simptomi transkortikalne senzorne afazije se sreću i kod oštećenja levog thalamusa, kao i u drugom i trećem stadijumu Alzheimerove bolesti.⁴ Transkortikalna motorna afazija obično nastaje kod lezije prefrontalnih oblasti mozga, ispred i iznad Brokine aree.⁷ Transkortikalna mešovita afazija se javlja kao posledica teških oštećenja mozga koja dovode do izolacije govorne aree od ostalih delova korteksa. Lezijom su zahvaćeni delovi korteksa koji okružuju glavna govorna područja (Brokina area, Wernickeova area i fasciculus arcuatus koji povezuje ove dve oblasti). Ovaj tip afazije se uglavnom sreće kod okluzije leve unutrašnje karotidne arterije, u stanjima prolongirane hipoksije ili kod teškog cerebralnog edema.⁷

Pored ovih osnovnih tipova transkortikalnih afazija identifikovana su još dva varijeteta: 1. transkortikalna mešovita afazija sa intaktnim imenovanjem⁸ i 2. transkortikalna senzorna afazija sa relativno očuvanim spontanim govorom i imenovanjem.⁹ Patološka osnova ovih oblika transkortikalnih afazija nije poznata, ali se nastoji objasniti mehanizam njihovog nastanka. Pretpostavlja se da se u njihovoj osnovi nalazi disocijacija između fonoloških i semantičkih procesa.

Prikaz bolesnika

Bolesnik B.Z., star 57 godina, dešnjak, PTT tehničar u penziji primljen je u Institut za neurologiju Kliničkog centra Srbije 18.3.1996. godine zbog naglo nastalih poremećaja govora, čitanja i pisanja i blage slabosti desnih udova. Nastanku ovih poremećaja prethodio je infarkt miokarda. Pri prijemu bolesnik je bio svestan, orijentisan u vremenu, prostoru i prema ličnostima. Neurološkim pregledom je otkrivena blaga hemipareza sa hemihipestezijom desne strane tela i afazija sa izraženim poremećajem razumevanja govora. Ispadi u vidnom polju nisu otkriveni.

EEG nalaz je pokazao lakšu disritmiju u prednjim delovima temporalnih regiona tokom hiperventilacije. Scintigrafijom mozga je otkriveno veliko hiperaktivno žarište sa osobinama infarkta u fronto-parijeto-temporalnom regionu leve hemisfere. Nuklearnom magnetnom rezonancom (NMR) je potvrđeno prisustvo hemoragičnog infarkta u temporo-parijetalnom delu leve hemisfere (slika 1).



Slika 1. NMR je utvrđen hemoragični infarkt u temporo-parijetalnom delu leve hemisfere

Neposredno po prijemu bolesnik je podvrgnut neuropsihološkom ispitivanju. Primljeni su: 1. Bostonski dijagnostički test za afazije (BDAE),² 2. Bostonski test nominacije (BNT),¹⁰ 3. Token test (TT),¹¹ 4. Reyov test verbalnog učenja,¹² 5. Rey-Osterrieth kompleksna figura^{12,13} i 5. Standardne Ravenove progresivne matrice.¹⁴

Rezultati

Iz uzorka spontanog govora snimljenog pri opisu slike "kuhinjska krađa" iz BDAE i na osnovu razgovora uočili smo da je B.Z. imao fluentan govor sa očuvanom prozodijom, artikulacijom i sintaksom. Nije imao problema u inicijaciji govora, niti je pokazivao znake logoreje. U govoru nisu uočeni fonološki deficiti, ali su se pojavljivali leksički poremećaji u vidu verbalnih parafazija. Tako na primer, pri opisu slike "kuhinjska krađa" bolesnik je umesto reči "stolica" upotrebio reč "krevet", a umesto reči "sudovi" reč "veš" (videti uzorak spontanog govora). Nije pokazivao posebne teškoće u pronalaženju leksičkih jedinica.

Uzorak spontanog govora - opis slike "kuhinjska krađa":

Dečak uzima kolače i pada sa kreveta. Ovde je kao kuhinja. Tu stoje neke šerpe, tanjiri i druge stvari. Žena pere veš, a ova slavina nije zatvorena i normalno da se preliva voda preko sudopere.

Verbalne parafazije su se ispoljavale i u toku konverzacije, kao na primer, na pitanje "Koliko imate godina?" bolesnik bi nekad odgovorio 63, nekad 64 i sl., a na pitanje "Šta ste po zanimanju?" odgovorio je "elektrotehnički uređaj" umesto PTT tehničar.

Rezultati ispitivanja jezičkih funkcija prikazani su u tabeli 1.

Tabela 1. Rezultati ispitivanja jezičkih funkcija (BDAE, BNT, TT).

TESTOVI I SUBTESTOVI	POSTIGNUĆE / MAKSIMALNI SKOR
BDAE :	
2 AUDITIVNO RAZUMEVANJE	
Reči	62/72
Delovi tela	15/20
Nalozi	5/15
Složeni ideacioni materijal	2/12
ORALNA SPRETNOST	
Neverbalna	10/12
Verbalna	14/14
Verbalni automatizmi	7/8
PONAVLJANJE	
Reči	10/10
Rečenice (velika verovatnoća)	8/8
Rečenice (mala verovatnoća)	6/8
IMENOVANJE	
Izazvano slikama	114/114
Izazvano pitanjima	27/30
Nabrajanje životinja	16/18
ČITANJE NAGLAS	
Reči	5/10
Rečenice	1/10
Razumevanje pisanog jezika	
Simboli i reči	8/10
Prepoznavanje reči	9/10
Sricanje naglas	3/8
Slaganje reči i slika	5/10
Rečenice i pasusi	2/10
PISANJE	
Ocena mehanizma pisanja	5/5
Simboli	37/51
Diktat na primarnom nivou	10/15
Diktat reči	1/10
Dikatat rečenica	0/12
Pisano imenovanje	3/10
Narativno pisanje	1/5
BNT	54/60
TT	21/62

Analizom dobijenih rezultata utvrdili smo da je B.Z. imao izražen poremećaj auditivnog razumevanja koji se ispoljavao još na nivou prepoznavanja pojedinačnih leksičkih jedinica. Poremećaj se posebno manifestovao prilikom izvršavanja verbalnih naloga i shvatanja ideacionog materijala. Nizak skor na TT (21 od mogućih 62 poena) takođe govori u prilog teškog oštećenja razumevanja govora (tabela 1).

Repetitivni govor kod našeg bolesnika bio je skoro potpuno očuvan. Uspešno je ponovio sve reči i 14 od 16 rečenica iz BDAE (tabela 1). Retke greške su se pojavljivale samo pri ponavljanju složenih rečenica koje sadrže manje frekventne reči. Tako na primer, rečenicu: "Na kineskoj lepezi je bio redak smaragd" ponovio je kao: "Na kineskoj lepezi je bio lep samart".

Na subtestovima imenovanja BDAE postigao je skoro maksimalan skor, a na BNT je uspešno imenovao 54 od 60 prikazanih ajtema (tabela 1). Ovi nalazi, kao i odsustvo teškoća u evociranju sadržajnih reči u spontanom govoru, ukazuju na očuvanost nominativne funkcije kod našeg bolesnika.

Pored izraženog poremećaja razumevanja B.Z. je imao i izrazito oštećenje sposobnosti čitanja i pisanja. Uspešno je pročitao 5 od 10 reči i samo 1 od 10 rečenica iz BDAE. Pored poremećaja usmenog čitanja imao je i probleme u razumevanju značenja napisanih simbola, što se moglo uočiti na subtestu slaganja reči i slika i subtestu rečenica i pasusa (tabela 1). U cilju detaljnije analize funkcije čitanja izvršili smo dopunsko testiranje sa listom reči sačinjenom od 20 imenica konkretnog značenja, 20 imenica apstraktnog značenja, 20 funkcionalnih reči i 20 ne-reči. Testiranje je sprovedeno nakon izvesnog oporavka sposobnosti čitanja i pisanja.

Rezultati su prikazani u tabeli 2.

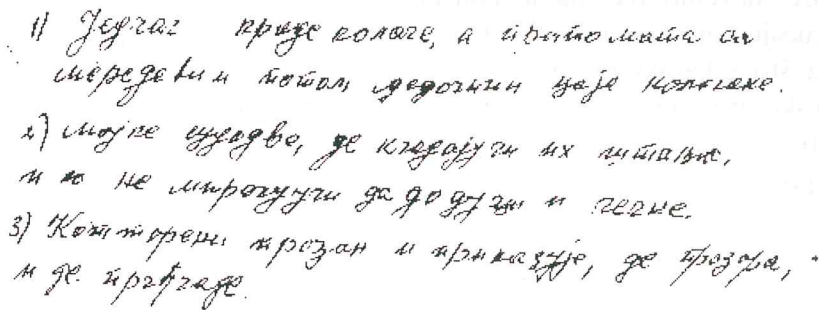
Tabela 2. Rezultati čitanja liste reči

Vrste reči	Postignuće / maksimalni skor
1. Konkretno imenice	19/20
2. Apstraktne imenice	16/20
3. Funkcionalne reči	14/20
4. Ne-reči	5/20

Iz tabele se može videti da je bolesnik znatno lošije čitao ne-reči u odnosu na ostale vrste reči. Ispoljavao je tendenciju osmišljavanja ne-reči, tj. njihovog prevodenja u reči sa značenjem, kao na primer, "klosos" je pročitao kao "klas", "bozir" kao "bizon", "pled" kao "pogled" i sl. B.Z. je postigao nešto lošije rezultate pri čitanju apstraktnih u odnosu na konkretne imenice, takođe je lošije čitao funkcionalne reči od imenica. Greške u čitanju su se ispoljavale po tipu vizuelnih i semantičkih paraleksija.

Procenom funkcije pisanja uočili smo da je bolesnik zadržao premorbidni grafomotorni obrazac, što se može videti iz uzorka pisanog govora (slika 2). Mogao je da napiše pojedinačna slova i brojeve, svoje ime, adresu i broj telefona. Takođe je imao očuvanu sposobnost prepisivanja jezičkog materijala. Međutim, B.Z. je ispoljio posebne teškoće prilikom pisanja po diktatu i pri samostalnom narativnom pisanju. Iz uzorka pisanog govora uočava se težak oblik disgrafije koja se manifestovala u vidu zamene grafema, dodavanja slova i slogova u rečima, što je potpuno izobličavalo strukturu reči, čak do neologizama (slika 2). Za dalju analizu pisanja primenili smo istu listu reči koju smo koristili i u proceni sposobnosti čitanja.

Rezultati su prikazani u tabeli 3.



1) Jednako krage volage, a idonno maia sa
merezeti i nojda, dedozini ceje kolage.

2) moje sudove, je krajaju ih nitalno,
i to ne mirajuju se godju i redne.

3) Komitoren, krozan i prikazije, se krozra,
i se krazaje.

Slika 2. Uzorak pisanog govora (opis slike "kuhinska krađa")

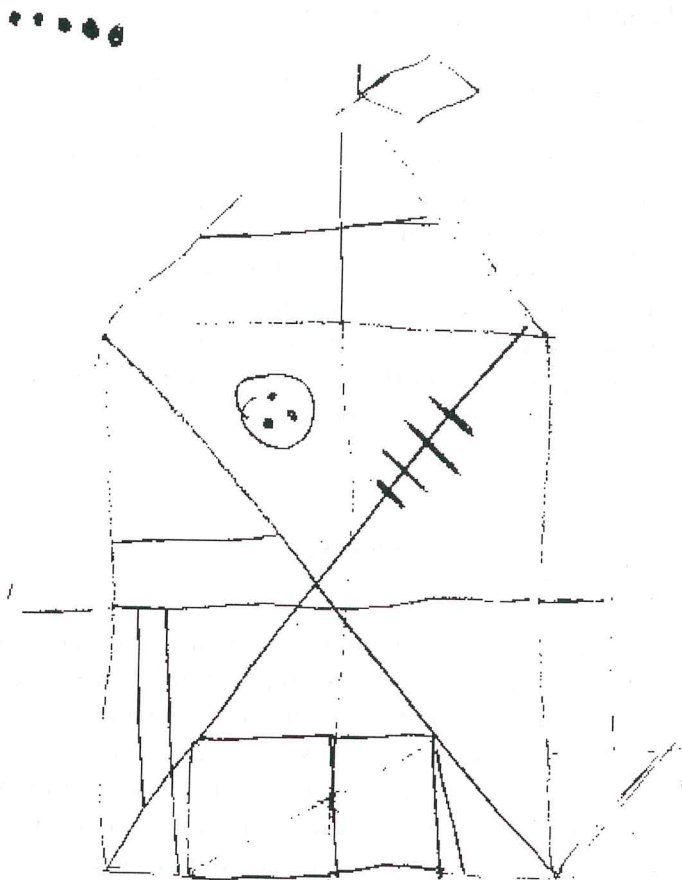
Tabela 3. Rezultati pisanja liste reči /diktat/

Vrste reči	Postignuće / maksimalni skor
1. Konkretno imenice	14/20
2. Apstraktno imenice	11/20
3. Funkcionalne reči	10/20
4. Ne-reči	1/20

Dobijeni rezultati pokazuju da je bolesnik imao posebno izražene teškoće u pisanju ne-reči. Korektno je napisao samo 1 od 20 ne-reči. Uspešnije je pisao konkretne u odnosu na apstraktno imenice, s jedne, i imenice u odnosu na funkcionalne reči, s druge strane. U pisanom govoru su dominirale vizuelne greške.

Ovakvi poremećaji čitanja i pisanja odražavaju elemente duboke ("deep") disleksije¹⁵ i dubinske ("deep") disgrafije.¹⁶

Pored jezičkih poremećaja, naš bolesnik je imao oštećenje verbalnog pamćenja, što se pokazalo nižim postignućem pri evokaciji (ukupan skor iz pet pokušaja : 27) i rekogniciji (skor 10) liste reči na Reyovom testu verbalnog učenja. Takođe je ispoljio blaži pad neverbalnog pamćenja, što se moglo videti prilikom evokacije Rey-Osterriethove kompleksne figure (skor 18,5). Na osnovu kopiranja Reyove figure možemo reći da je bolesnik imao diskretnu konstruktivnu apraksiju koja se manifestovala pogrešnim uočavanjem pojedinih detalja, što je karakteristično za levostrane lezije mozga (slika 3). Ukupan skor pri kopiranju ove figure je 31,5. Opšte intelektualne sposobnosti, merene Ravenovim progresivnim matricama, bile su u granicama prosečnih vrednosti (skor 36).



Slika 3. Crtež Rey-Osterriethove složene figure

Za vreme jednomesečne hospitalizacije bolesnik je pored medikamentozne terapije bio podvrgnut i rehabilitaciji oštećenih funkcija. Dva meseca po otpustu izvršili smo retestiranje jezičkih funkcija, pri čemu smo konstatovali značajan oporavak afazije. Međutim, bolesnik je i dalje imao teškoća u korektnom izvođenju višestrukih nalog, a povremeno su se pojavljivale verbalne parafazije tokom konverzacijskog govora, i to uglavnom pri odgovorima vezanim za godine starosti, što se može videti iz sledećeg primera: na pitanje "Koliko imate godina?" bolesnik je odgovorio 67, sad ću i 68 umesto očekivanog "57 odnosno 58", uz odsustvo uviđajnosti za učinjene greške. U spontanom govoru (opis slike "kuhinjska krađa") nije ispoljio fonološ-

ke, leksičke ni sintaksičke poremećaje. Procenom sposobnosti čitanja i pisanja uočen je značajan stepen restitucije ovih funkcija. Greške u čitanju su se uglavnom pojavljivale kod višesložnih reči, i to u vidu zamene fonema. Nije ispoljio posebne probleme u razumevanju značenja napisanog jezičkog materijala iz BDAE, ali je imao teškoća u razumevanju i shvatanju dužeg teksta, što se uočavalo pri čitanju članaka iz dnevne štampe. Međutim, bolesnik je tvrdio da razume sadržaj pročitano g teksta i pored evidentnih teškoća koje su se tom prilikom manifestovale. Greške u pisanju su se ispoljavale uglavnom u vidu zamene grafema. B.Z. je i ovog puta pokazivao velike teškoće pri čitanju i pisanju ne-reči. Pored oporavka jezičkih sposobnosti, primćeno je i značajno poboljšanje sposobnosti verbalnog pamćenja.

Diskusija

Disocijacija između pojedinih modaliteta jezičke funkcije (spontan govor, razumevanje, imenovanje i ponavljanje) predstavlja jedan od osnovnih kriterijuma za kliničko razvrstavanje afazičnih bolesnika. Tako na primer, kod Brokine i transkortikalne motorne afazije uočava se znatno bolja sposobnost auditivnog razumevanja u odnosu na spontan govor. U anomičkoj afaziji se javlja disocijacija između imenovanja, s jedne i razumevanja i ponavljanja, s druge strane, pri čemu bolesnici sa ovom afazijom imaju oštećenu nominaciju, a relativno očuvano razumevanje i ponavljanje govora. U konduktivnoj afaziji se ispoljava nesrazmerno težak poremećaj ponavljanja u poređenju sa očuvanom fluentnošću govora i skoro potpuno očuvanim razumevanjem. Bolesnik koga prikazujemo u ovom radu imao je jednu neuobičajenu sliku afazije koja se manifestovala fluentnim spontanim govorom i očuvanom nominacijom, a izraženim poremećajima razumevanja, čitanja i pisanja. Ovako ispoljena slika afazije naizgled podseća na nekoliko poznatih sindroma kao što su Wernickeova afazija, čista gluvoća za reči i transkortikalna senzorna afazija.

Prema fluentnom govoru, oštećenom razumevanju, disleksiji i disgrafiji, klinička slika jezičkih poremećaja kod našeg slućaja lići na sindrom Wernickeove afazije. Međutim, za razliku od bolesnika sa ovim tipom afazije koji imaju izražene poremećaje ponavljanja i ime-

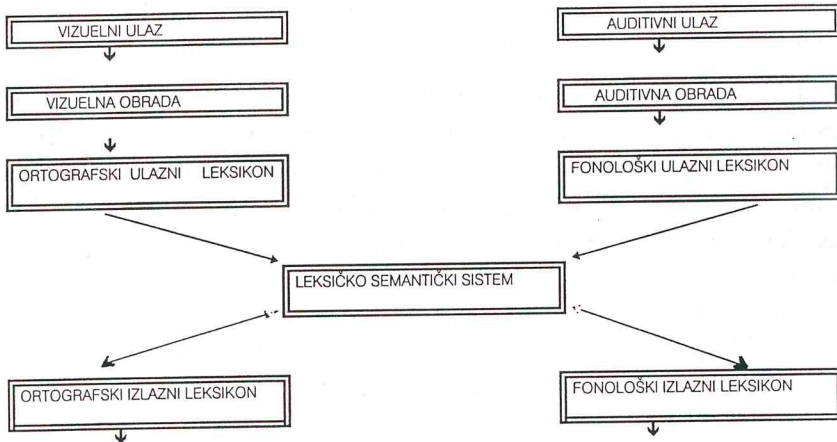
novanja, kod našeg pacijenta su ovi modaliteti govora bili potpuno očuvani.

Bolja sposobnost spontanog govora i imenovanja u odnosu na auditivno razumevanje približava našeg bolesnika sindromu čiste gluvoće za reči. Međutim, pacijenti sa ovim sindromom nisu u stanju da ponavljaju govorne stimulse, po čemu se potpuno razlikuju od ovog bolesnika, koji ne samo što je uspešno ponavljao zadate reči i rečenice, već je pokazao i eholaličan oblik verbalnog ponašanja. Eholalija se posebno ispoljavala za vreme testiranja auditivnog razumevanja, pri kojem je pacijent neposredno ponavljao dati nalog za ispitivačem. Druga razlika ogleda se u tome što pacijenti sa čistom gluvoćom za reči imaju očuvanu sposobnost čitanja i pisanja, te na taj način mogu da komuniciraju sa okolinom. Nasuprot tome, naš bolesnik je imao teško oštećenje vizuelnih modaliteta jezičke funkcije.

Posmatrano sa kliničkog aspekta, jezički poremećaji kod našeg bolesnika najviše podsećaju na transkortikalnu senzornu afaziju. Međutim, za razliku od bolesnika sa ovim tipom afazije koji imaju flentan, ali prazan govor,⁴ B.Z. nije imao teškoća u evociranju reči sa značenjem. Odsustvo cirkumlukucije, retka upotreba semantički praznih reči tipa "neki", "ovaj" i sl. i retko produkovanje verbalnih para-fazija čini govor ovog bolesnika sasvim korektnim u leksičko-semantičkom smislu. Osim toga B.Z. je imao potpuno očuvanu nominaciju, dok je anomija jedan od centralnih simptoma transkortikalne senzorne afazije.

Analizirajući karakteristike afazije kod našeg bolesnika u svetlu dobro definisanih afazičnih sindroma, zaključili smo da je reč o specifičnom obliku transkortikalne senzorne afazije koju su Heilman i sar. (1981) opisali pod nazivom transkortikalna senzorna afazija sa relativno očuvanim spontanim govorom i imenovanjem.⁹ Razlika između pacijenta koga su opisali ovi autori i našeg bolesnika je u tome što se u našem slučaju disleksija nije manifestovala samo pri čitanju ne-reči, već i prilikom čitanja materijala sa značenjem. Druga bitna razlika ogleda se u tome što je B.Z. imao težak oblik disgrafije koja je odražavala oštećenje lingvističkog aspekta pisanja, dok se u slučaju Heilmanovog bolesnika poremećaji pisanja vezuju za ideomotornu apraksiju. Nasuprot njemu, naš bolesnik nije imao elemente ideomotorne apraksije.

O transkortikalnoj senzornoj afaziji sa očuvanim spontanim govorom i očuvanom nominacijom ima veoma malo podataka u literaturi, pa je i mehanizam nastanka ove afazije nedovoljno objašnjen. Čini nam se da u interpretaciji kliničke slike ovog oblika afazije može da posluži hipoteza o funkcionalnoj građi (organizaciji) leksičkog sistema,^{17,18} prema kojoj je znanje o leksičkim oblicima reprezentovano u autonomnim, modalno-specifičnim komponentama, i to posebno za obradu na ulaznom (aferentnom) i izlaznom (eferentnom) nivou. Ovom hipotezom je istaknuta razlika između fonološkog ulaznog ("input") i izlaznog ("output") leksikona, kao i između ortografskog ulaznog i izlaznog leksikona. Ulazni i izlazni leksikoni su povezani semantičkom komponentom.¹⁹ što se može videti na sl. 4.



Slika 4. Shematski prikaz leksičkog sistema

Očuvana sposobnost evociranja reči sa značenjem za vreme spontanog govora i uspešno imenovanje objekata govori u prilog činjenici da bolesnici sa transkortikalnom senzornom afazijom sa očuvanim spontanim govorom i imenovanjem imaju očuvan prilaz iz leksičko-semantičkog sistema do fonološkog izlaznog leksikona, što im omogućava da uspešno saopštavaju misli i ideje i imenuju predstavljene stimulse. S druge strane, prekid veza između fonološkog ulaznog leksikona i leksičko-semantičkog sistema osujećuje prilaz ovog leksikona do oblasti odgovornih za semantičku obradu pojmova i time izaziva poremećaje u razumevanju govornog jezika. Istovreme-

no, pretpostavljamo da su poremećaji pisanog govora u slučaju našeg bolesnika izazvani prekidom komunikacije između leksičko-semantičkog sistema i ortografskog izlaznog leksikona. Naime, na osnovu karaktera grešaka u pisanom govoru, stiče se utisak da B.Z. nije imao problema u pronalaženju leksičkih jedinica, ali je očigledno ispoljavao teškoće u njihovoj realizaciji ortografskim putem.

Polazeći od pretpostavke da oštećenje centralnog leksičko-semantičkog sistema izaziva leksičke poremećaje u svim modalitetima jezičke funkcije,¹⁹ možemo zaključiti da jezički poremećaji kod našeg bolesnika nisu izazvani oštećenjem na nivou centralnog leksičko-semantičkog sistema, već prekidom veza između ovog sistema i njegovih segmenata.

Iako se o anatomskoj lokalizaciji semantičkih procesa teško može precizno govoriti, pretpostavka je da se semantička obrada jezičkih informacija odvija na nivou parijetalnog režnja.^{20,21} S obzirom da je B.Z. imao fokalno oštećenje mozga u temporo-parijetalnom delu leve hemisfere, pretpostavljamo da je ovom lezijom osujećen transfer informacija iz Wernickeove aree do oblasti odgovornih za semantičke funkcije, i time onemogućeno shvatanje značenja primljenih poruka. Izraženi znaci disleksije i disgrafije pokazuju da je lezijom verovatno zahvaćen i gyrus angularis, s obzirom da se poremećaji čitanja i pisanja uglavnom vezuju za leziju ovog dela korteksa.^{2,22} Prema tome, moguće je da transkortikalna senzorna afazija sa očuvanim spontanim govorom i imenovanjem nastaje kao posledica žarišnih lezija auditivnog asocijativnog korteksa i gyrus angularisa, ostavljajući pri tom pošteđenu Wernickeovu areu i njene veze sa Heschlovom vijugom.

Kod bolesnika sa transkortikalnom senzornom afazijom sa očuvanim spontanim govorom i imenovanjem relativno brzo dolazi do značajnog oporavka jezičkih funkcija, uz zaostajanje suptilnih poremećaja koji se mogu otkriti samo specijalizovanim afaziološkim ispitivanjem. Verovatno da se zbog toga u praksi retko i identifikuju slučajevi sa ovim tipom afazije. Međutim, egzistiranje ovog oblika afazije kao zasebnog kliničkog entiteta i razumevanje mehanizma njenog nastanka ima poseban značaj za savremenu teoriju i praksu.