

*Case Report***Emotional adjustment after stroke: The role of early neuropsychotherapeutic interventions in patients following brain damage**Klaus R.H. von Wild, MD, PhD, Prof. Hon. Caus., Dr. Hon Caus.,<sup>1</sup> Birgit Kemper, PhD<sup>2</sup><sup>1</sup>Professor of Neurosurgery, Medical Faculty Westphalia Wilhelm's-University, Münster, Germany  
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Professor h. c. Department Physical Rehabilitation Al Azhar University, Cairo, Egypt<sup>2</sup>Head Neuropsychologist, Special unit or early neurosurgical rehabilitation, Clinic for Neurosurgery, Director Prof. Dr. med. Uta Schick, Clemens Hospital, Academic Hospital of the Medical Faculty W.W.-University, Münster, Germany**ABSTRACT**

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**Objective:** Post-stroke depression has been considered the most common neuropsychiatric consequence of stroke, even in the presence of successful neurological recovery and good health-related quality of life. This report describes a patient's catastrophic reactions to his unexpected illness, with a focus on the therapeutic process, to provide an understanding of managing denial and how to approach and engage brain-damaged patients.

**Methods:** This is a case study of a 65-year-old businessman with mental-cognitive and behavioral impairments following hypertensive cerebellar massive hemorrhage and secondary hydrocephalus, who made a complete recovery following psychotherapeutic intervention.

**Results:** Our supportive psychotherapeutic approach combined with cognitive interventions enabled this patient overcome moderate mental-cognitive and behavioral deficits and extreme defensive coping strategies, and facilitated his successful social re-entry.

**Conclusions:** Brain-damaged patients with preserved self-awareness and a high level of independence in activities of daily living (ADL), who do not have pre-existing psychiatric conditions, can benefit from

individualized psychotherapy over time. Attention needs to be focused on a recovery beyond functional outcomes, with an understanding of holistic neurorehabilitation as a method of reconstructing lives within a social context. Further research and education is needed for the development of proper psychotherapeutic approaches to address aspects such as emotional coping and finding sense in life following brain damage.

**Key words:** post-stroke depression, mood disorders, psychotherapy, neurorehabilitation

**Introduction**

There has been growing interest in recent times regarding mood disorders following traumatic brain injury and cerebrovascular disease [1-3]. The severity of depression and neurocognitive impairment following brain damage has a major impact on the patient's response to rehabilitation, functional recovery, social re-integration, and life satisfaction [4-6]. Some patients may show complete or nearly complete physical recovery following a cerebrovascular accident, but might have profound and long-lasting residual neuropsychological deficits and even stand an increased risk of developing neuropsychiatric disorders. This raises the question of how the interaction between cognitive disturbances and coping strategies influences the patient's subjective perception of health. Psychotherapeutic approaches for brain-damaged individuals are rare. This might be because the effectiveness of psychotherapy in brain-injured patients has been a controversial subject for years [7, 8]. Disorders of self-awareness and severe neurocognitive impairment were thought to be complete contraindications for psychotherapeutic interventions. Research on psychosocial treatments for depression in non-stroke and stroke populations has focused on the impact of cognitive and problem-focused therapy [9].

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These programs do not offer adequate interventions for patients who, after suffering completely unexpected brain lesions, are looking for answers to questions such as what makes life meaningful, while struggling with the fear of losing the individual's historical view of him- or herself. Some authors demand a theoretical core model to guide psychotherapeutic practice and research in brain-injured patients, and stress the careful selection of brain-injured patients for psychotherapy [10]. This is exemplarily demonstrated in the following case report.

## Methods

### Participant-case report

#### Medical history

A 65-year-old successful businessman, born in 1932, suffered from coma (Glasgow Coma Scale, GCS 8) due to spontaneous hemorrhage into the left cerebellar hemisphere that caused CSF blockage by compression of the fourth ventricle (see Figure 1).

After CT-angiography and exclusion of cerebral vessel anomalies, a right frontal external ventricular drainage was immediately set in place and left for 7 days. Soon after intensive care treatment, the patient regained consciousness (GCS 9, then 11 and 12). A left cerebellar symptomatology was observed. After a few days, the patient was able to communicate, but he was disoriented regarding persons, places, and time. When

slightly oriented (GCS 13, 14), the client strictly refused any kind of further rehabilitation during the post-acute recovery phase in the medical ward, where he had been transferred for diagnosis and treatment of previously undetected hypertension and type 2 diabetes mellitus. Therefore, he was sent home without any recommendation after 4 weeks. During a follow up, the patient's family asked for an appointment with the author, who had seen him as a consultant during the acute stage. There were no neurological deficits; however, remarkable neuropsychological impairments were obvious. Six weeks later, upon the neurosurgeon's recommendation, the patient agreed to undergo his first neuropsychological examination.

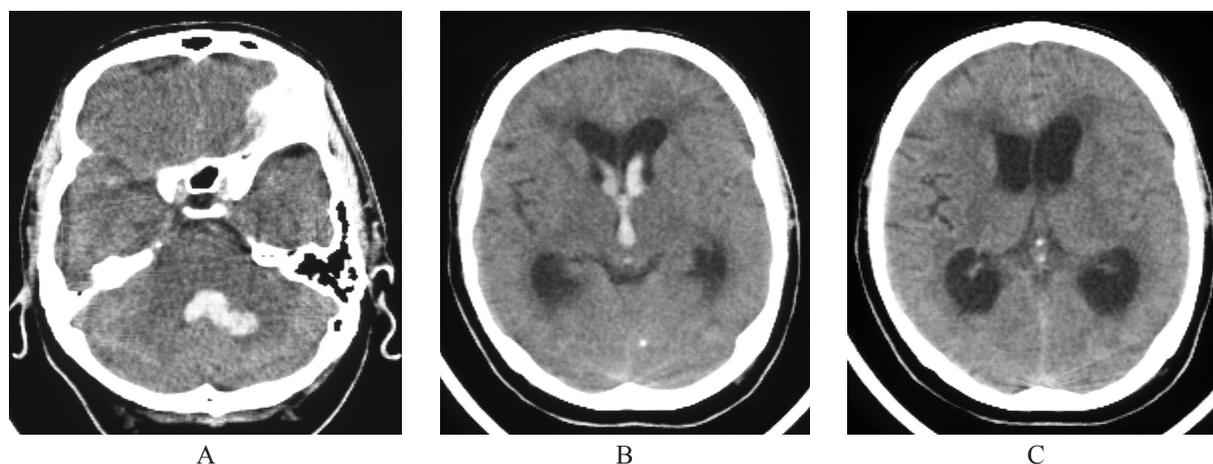
### Patient's subjective report

#### Cognitive impairments

The patient complained of being overstrained by information in his environment. In addition, he reported problems with focus during conversations and while conducting negotiations with customers. He forgot names of well-known individuals and could not remember telephone conversations in detail.

#### Emotional and behavioral changes

The patient reported a tendency to observe every physical change, and a fear of another sudden cerebral hemorrhage. He was anxious, because he did not understand his failure to cope with work activities. He



**Figure 1.** (CCT studies)

Male, born 1932, GCS 8. Emergency cranial computerized tomography (CCT) images obtained without application of contrast medium 1998-03-23 1 h after the first insult. The patient was immediately admitted to the neurosurgical department of the local University hospital for further diagnostics and acute external CSF drainage.

- Acute hemorrhage within the right cerebellar hemisphere breaking through into the ventricular system with blockage of the IVth ventricle. Hypertonic? Vascular malformation? Angio-CCT or four-vessel cerebral angiography was indicated.
- Fresh intraventricular hemorrhage within the side ventricles and third ventricle. Pathological anatomical signs of impending CSF-blockage included peri-ventricular edema along the ventricular polar caps, indicating an external ventricular CSF drainage
- Signs of acute CSF blockade distal to the third ventricle, with symmetrical dilation of both side ventricles and bulging of the polar caps with subependymal edema. External CSF ventricular drainage was indicated.

was unable to stop pondering about his future, complained of a substantial loss of energy, felt ashamed of his failures, and had a tendency to hide all his difficulties. Although he enjoyed social engagement in his role as a respected businessman, he avoided attending social events. He questioned his identity as a businessman, asked himself if life was still meaningful, and harbored suicidal intentions.

**Objective neuropsychological test findings**

The patient was oriented regarding time and place. He had vague recollections of the events during his medical treatment at the intensive care unit. Measures of premorbid intellectual functioning by means of a vocabulary test (Mehrfachwahl-Wortschatztest, MWT-B) suggested that his premorbid IQ had most likely been 100 to 110 [11]. Aphasia screening by the Token test yielded values in the normal range [12]. Word fluency was reduced, as assessed by the Benton word fluency test [13]. A computerized diagnosis of attention function (Testbatterie zur Aufmerksamkeitsprüfung, TAP) demonstrated slow reaction times in an alertness task [14]. The patient was overtaxed by a complex divided attention task. On the verbal learning memory test (VLMT) all test parameters demonstrated results in the abnormal range [15]. A non-verbal memory test (Diagnosticum für Cerebralschäden, DCS) [16] also revealed considerable impairments in learning. The degrees of impairment in memory, attention, and word fluency are summarized in Table 1.

**Behavioral characteristics during neuropsychological assessment**

During our first brief neuropsychological diagnostic session, the client realized his cognitive failures and exhibited a catastrophic reaction. Having been an ambitious senior businessman, he wished also to be the manager of the therapeutic situation. When the therapist took a more direct part in the communication, his defensive denial increased. At the end of the assessment the client vehemently rejected psychotherapeutic support. At the second consultation 3 weeks later with the author, towards whom the patient demonstrated deep respect, he evinced an interest in trying to participate in psychotherapy.

**Procedures**

We considered 4 kinds of therapeutic steps over a period of 6 months. During the first month the client came twice a week, then once a week. The therapeutic steps were used in a non-hierarchical way during the therapy.

Our procedure focused on the following aspects:

1. Development of a therapeutic alliance
2. Educating the patient about type and nature of the neuropsychological disorders
3. Supportive psychotherapeutic interventions
4. Computerized cognitive training
5. Development of cognitive compensatory techniques

An overview of relevant aspects of the medical history and neuropsychological assessment is shown in Table

**Table 1.** Results of cognitive testing

	Raw score	Percentile	
		10%ile to 5%ile moderate impairment	<5%ile severe impairment
<b>TAP</b>			
Alertness without warning			
MD of reaction time	413,50 ms		*
SD of reaction time	91,06 ms		*
Alertness with warning			
MD of reaction time	307,00 ms	*	
SD of reaction time	78,03 ms	*	
<b>VLMT</b>			
Learning trial 1-5	2/3/3/3/3		*
Short delay/free recall	no word		*
Long delay/free recall	no word		*
Recognition error	4 words		*
<b>DCS</b>			
Learning trials 1-6	1/1/2/2/1/1		*
<b>Word fluency</b>			
Total words	8 words		*

MD, median; SD, standard deviation

**Table 2.** Clinical summary of a patient who experienced spontaneous hypertonic mass bleeding in the left cerebellar hemisphere

Dimension	Content
<b>Evaluation</b>	
History	Spontaneous hypertonic mass bleeding in the left cerebellar hemisphere with infiltration into the fourth ventricle and consequent obstructive hydrocephalus (emergency CCT, neurological clinic) at the age of 65 years. Patient evaluated during an outpatient consultation, neurological diagnosis without any evidence of functional impairment
Interview	Highly ambivalent towards neuropsychological assessment, spontaneous mentioning of cognitive failures
“Projected” information	“You can’t help me. I am here because Professor von Wild sent me.”
Phenomenological experience	“I don’t know why I feel so low in energy and have difficulties in doing simple things. I am just a silly person.
Behavior and emotional/motivational characteristics during testing	Catastrophic reaction, rejecting further cognitive tests, self-blame, peevishness towards the therapist, very reduced ability in emotional self-perception, irritable, feeling ashamed of test results
<b>Conclusions</b>	
Reactionary	Catastrophic reaction, symptoms of depression and anxiety
Neuropsychological	Moderate attention and memory deficits, excellent preserved language functions, defensive denial towards all recommendations of non-medical treatment options
Characterological	Solicitous, energetic, patriarchally structured personality, duteous, very emotionally controlled person

2, according to a scheme found in case reports by Prigatano [17].

**Results**

Evaluation revealed that the patient’s subjectively experienced threat was most relevant to his symptoms of depression and his difficulties in the emotional adjustment process. The patient was an eligible candidate to benefit from psychotherapy and exhibited the excellent higher-order language skills needed for verbally mediated therapy. He did not suffer from anosognosia, but from defensive denial. Despite moderate cognitive impairments, he was able to manage his ADL independently. We believed that initial trans-disciplinary collaboration of the neurosurgeon and neuropsychologist was the first step towards promoting the development of a therapeutic alliance. A supportive psychotherapeutic approach, combined with cognitive interventions, allowed the patient to deal with the overwhelming emotions associated with his near-death experiences. He was thereby able to find meaning in life outside a solely efficiency-oriented lifestyle as a successful businessman.

Having experienced acute hemorrhage due to spontaneous vascular insult, the patient talked extensively about his emotionally overwhelmed state

during the first 2 psychotherapy sessions. Each of these sessions ended with an emotional outburst.

Thereafter, he participated in a simple computerized cognitive training. This approach motivated him to describe his everyday difficulties more precisely, and to accept being educated on the use of compensatory memory aids. At the end of psychotherapy, the patient was able to experience a restoration of mental resources. In addition to reviewing his business successes, he was also able to practice other things that make life worth living. He was able to focus on enjoying social activities together with his wife and friends and on his role as a grandfather. The patient regained more interests in former hobbies, e.g., visiting concerts and art exhibitions, and collecting contemporary art.

**Discussion**

The greatest challenge was to manage the patient’s denial and to minimize the risk of abandoning therapy early. One of the key objectives was to obtain an explanation of the client’s emotional and behavioral changes, which seemed to overshadow his symptom of depression. In this specific case, computerized cognitive training had high psychotherapeutic value. With the use of memory compensation aids in the course of therapy, the patient improved his ability to

confront his cognitive deficits. The precise cause of the client's cognitive impairments is unclear. Neuroanatomical, neuroimaging, and clinical studies show growing evidence that the cerebellum is involved in cognitive functions and affective regulation [18]. We, therefore, believe that the influence of cerebellar disconnection with associative areas of the cerebral cortex being might be responsible for the patient's cognitive deficits, in addition to the sequelae following intracranial brain compression by CSF blockade at an advanced age. During computerized cognitive training, the patient also experienced restoration of mental resources that helped stabilize his self-confidence. However, during the intervention he did not give up his denial completely. We accepted that the patient brought up the essential subject of identity only superficially in the therapeutic dialogue, when it was not possible to openly discuss the meaning of cognitive schemes according to cognitive behaviorally-oriented psychotherapy. A disinclination to discuss emotional experiences should not *per se* be interpreted as negative. This kind of coping, when analyzed against the background of his efficiency-oriented premorbid personality, should be understood to reflect a protective mechanism. Our interventions were based on a more patient-centered approach. This approach seemed to reduce his anxious tension in the post-acute state and his pressure to always appear perfect in the eyes of the therapist. This non-confrontational approach possibly helped the patient place less importance on others' expectations and to promote the feelings of autonomy that are important in the context of his life role. We supported the patient being the "leader", because leadership was an essential component of his self-identity prior to the brain injury.

Psychotherapeutic literature supports the premise that mourning is essential in the therapeutic process to cope with loss [19]. We believe that mourning caused emotional relief that enabled the patient to accept his cognitive limitations.

The importance of repeated neuropsychological assessments is often underestimated by both, neurosurgeons and neurologists, especially in the case of patients without physical neurological impairments. Patients and their relatives often attribute their failures to a lack of effort, rather than considering such failures a consequence of their brain injury. Impairment of self-awareness and denial in brain-injured clients can make it difficult to identify residual cognitive deficits in short clinical appointments. The aim of psychotherapy should be to teach the client to behave in his own best self-interest as to avoid the chronic manifestation of mood disorders and to promote the client's social re-entry [20]. Trans-disciplinary interventions might help increase awareness of the potential role of psychotherapy in brain-injured individuals.

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CCT original films (Figure 1) courtesy Benedikt A. Prümer M.D, Head, Institute for Radiology, Herz-Jesu-Hospital, Muenster-Hiltrup, D.

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