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FINE ART AND THE QUALITY OF LIFE OF A PROMINENT ARTIST WITH FRONTOTEMPORAL DEMENTIA

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SUMMARY

Background:

In neuroscience, no coherent definition of art is generally accepted, because its boundaries are redefined continuously, and at any time one may encounter an artwork that departs from the existing definitions. Art is considered an essential element of any educational and/or therapeutic approach aimed at developing the imagination and enriching the emotional life of the patient.

Case study:

This article describes a prominent Cracow artist with a rapidly progressing frontotemporal dementia (FTD). An analysis of his artwork shows that the disturbances caused by his disease have changed his artistic style in startlingly varied ways, from insight and innovation to the complete loss of creativity. The discussion takes into account similar presentations that can be found in the world literature. Emphasis is given to the possibility of expressing one's own unique view of the world in fine art until advanced stages of the illness.

Conclusions:

The production of works of art by persons suffering from frontotemporal dementia requires acceptance from the immediate surroundings. Art may be considered an important therapeutic tool, since it improves the quality of life of both patients and persons in their immediate surroundings.

Key words: neurodegenerative diseases, artistic creativity, style of painting, gradual loss of creativity

INTRODUCTION

When considering the relationship between art and the quality of life of people with brain injuries, regardless of their etiology, we first need to define what art is. In neuroscience there is no single, coherent, generally accepted definition of art, because its boundaries are constantly being redefined. At any time one may encounter a work of art that does not fit within any arbitrarily adopted definition (Brown, 2010). Art is often considered to be an essential element of any educational and/or therapeutic program aimed at developing the imagination and enriching the interior life of any person. In this way art helps people, in good health or bad, to lead a better and easier life (Bäzner & Hennerici, 2007).

In the art therapy programs conducted in a number of rehabilitation centers, and in some institutes of learning or museums, the term “fine arts” is mainly limited to the visual forms (cf. Brown, 2010). While working with brain-damaged persons, four models of art-related actions are usually adopted (Atkinson & Wells, 2000):

- construction of objects whose form has all the qualities necessary to consider it a work of art (e.g. sculpture, painting);
- adding new features to works that have already been established as a proper works of art;
- recognizing arbitrary objects as works of art, if they are placed in the appropriate context, such as Marcel Duchamp’s “Fountain,” or the burning protest song by Krystyna Habura (an image on which the artist placed 45 figural candles depicting human figures, which were lit and allowed to burn down during a major exhibition in Chicago devoted to protest against the Vietnam war; cf. Pąchalska, 1999);
- creating theoretical objects with tautological characteristics that are statements about art in a work of art (conceptualism, meta-art).

In this paper we focus mainly on visual art, which involves many mental processes, including basic motor skills (such as coordination of movements), visuo-spatial abilities, and executive functions (Bogousslavsky, 2005, 2006). A moderating influence on works of art is also exercised by the artist’s emotions and creative abilities, as well as the social and cultural contexts (Piechowski-Jozwiak & Bogousslavsky, 2013). This means that the relationship between creativity and the symptoms of semantic dementia can be very complex. The disorders resulting from damage to the brain can be seen to change one’s artistic style and lead to surprisingly different results: from the emergence of innovation to the loss of creativity in general (Pąchalska et al., 2014).

THE CORRELATION BETWEEN ART AND THE QUALITY OF LIFE OF BRAIN-DAMAGED PATIENTS

Many great physicians have always understood the relationship between art and medicine, since they believe it can have an impact on the quality of the patient’s life (Aleksandrowicz, 1982; Moskala, 2013; Pąchalski, 1984; Szczeklik,

2002; Skotnicki, 2013). They stress the fact that art emerged with the development of human civilization, and although initially it was primarily a function connected with magical rites, it now meets a variety of functions, including esthetic, social, educational, and of course therapeutic (Glencoe, 2005). Although these functions do not constitute the essence of art, still, artistic expression is bound to human health and has a potential impact on health.

Aleksandrowicz (1982:55) writes:

The search for elements conducive to health within the esthetic disciplines is justified for me by an ancient idea, proclaiming that nothing human, nothing that leads to health or disease, should be either strange or indifferent to the physician.

Another great physician, Professor Andrzej Szczeklik, also notes in his book entitled *Catharsis* that myths, magic, and art are expressions of the unity of the human person with the universe. And this involves also medicine: great medicine, real art is conscious of its sources, its unprecedented achievements, and its limitations. Szczeklik (2002:17) writes that:

Medicine and the arts derived from a single trunk. Both originate in magic – a system based on the omnipotence of the word. A properly expressed magic formula brings health or death, rain or drought, evokes spirits and reveals the future. It touches upon factors invisible to those who with steadfast confidence bustle around everyday matters. The spells used for understanding and curing diseases (...) have the form of verse, full of alliterations and assonances, which deserve the attention of scholars dealing with literary studies.”

In the Cracow School of Rehabilitation, founded by another eminent Polish scholar and a great physician, the late Prof. Adam Pąchalski¹, art therapy was included in the Comprehensive Rehabilitation Model elaborated there (Pąchalski, 1984). One of the authors of this article took an active part in this program (Pąchalska et al., 2014). Prof. Adam Pąchalski belonged to the “Big Four” founders of the Polish School of Rehabilitation², characterized by four principles:

- universality of access;
- continuity;
- comprehensiveness;
- adaptation to the individual needs of the patient.

¹ Prof. dr hab. med. Adam Pąchalski, a member of the Society of Underground Home Army Soldiers, Inspectorat “Maria” in Krakow. Full Professor of the Academy of Physical Education in Krakow, the Dean of the Faculty of Physical Education (1969-1972), Vice-Rector for Academic Affairs (1978-1981), founder and director of Institute of Motor Rehabilitation. Specialist in orthopedics, traumatology, and rehabilitation, founder and first head of the Medical Rehabilitation Unit in Witkowice. Initiated the creation of the Cracow Rehabilitation Center, where he later served for many years as attending physician and head of the Medical Rehabilitation Department. Served for many years as President of the Cracow Branch of the Polish Society for Disabled People. Head of the Outpatient Clinic for patients with multiple sclerosis. Author of more than 200 scientific papers on orthopedics, traumatology, and rehabilitation (see Pąchalska & Schmidt-Pospula, 2004; Pąchalska et al., 2014).

² The Big Four of the Polish School of Rehabilitation included Profs. Wiktor Dega, Marian Weiss, Aleksander Hulek, and Adam Pąchalski.



Fig. 1. Prof. Adam Pąchalski, M.D. (1926-2010)
Photo. Halina Garzyńska-Kańska

From these principles there arose an understanding of the need to comprehend the symptoms. In his publications and clinical activities, he put great emphasis on the connection between art and medicine, emphasizing the fact that the body is always trying to adapt to the environment, while trying to realize its potential, including creative potential.

Through the teaching, inspiration and efforts of Prof. Pąchalski, an art therapy program was developed. The program was structured and adapted to the nature of the symptoms and the individual needs of patients (Pąchalski et al., 2004), and subjected to repeated verification in clinical practice with patients with various kinds of brain injuries (see Pąchalska, 1986, 1999, 2008, 2013; Pąchalska et al., 2008; Pąchalska et al., 2014; Kaczmarek, 1991). This long-term research was possible, among other things, because Professor Pąchalski was a man fascinated by life - but viewed from a certain distance, like any true scientist. This concerned not only science, but also other aspects of life. His very good friend, Prof. Bruce Duncan MacQueen, pointed out in a funeral speech (MacQueen, 2010), that Prof. Pąchalski observed with great pleasure and patience the behavior of animals, and the ways they used to solve difficult problems. Those who knew him only as a distinguished physician and professor would be surprised by his ability to pantomime the movements of a bird that wanted to drag a piece of string into its nest, after which he would laugh himself to tears, at himself to a large extent. He used to compare the process of this bird overcoming difficulties with the hard and often ungainly struggle of a disabled person to overcome acquired limitations. This great physician often gave his patients words of wisdom, based on the idea that we are all “self-authors.” These words were often of great help to his patients in their fight with disease and disability. Perhaps his favorite saying, engraved on a plaque in his office, was *Everyone has their own peak to strive for – the road itself is the goal.*

Pąchalski (1984) also argued that the process of reintegration of the disabled person is in some sense a paradox: the goal is to adapt to externally imposed conditions, and at the same time to express internal dynamisms that reflect the desire of individuals to realize their capacities and capabilities, including the possibility of creativity in a state of severe illness and disability. He understood the great variability of symptoms, and asserted that this was characteristic of persons with brain damage. He explained that this was not only because of the nature of the damage to the brain tissue, which might be distributed throughout the brain, but also, and perhaps primarily, because brain damage disrupts normal mental processes in a particular way. He taught that art therapy plays an important role in the process of reintegrating patients into society³.

Pąchalski (1984) observed that disorders following injury or brain dysfunction may vary due to a number of factors⁴. A good example is the variability in naming and repetition difficulties exhibited by patients with aphasia. Even more variable are the symptoms of apraxia and agnosia. This was very evident in a case of fluctuating aphasia, occurring during the stroke-like episodes of MELAS syndrome, where the symptoms were changing almost from week to week and even from day to day (see Pąchalska & MacQueen, 2001). The same applies to a patient with depression or schizophrenia. The nature and severity of the disorders observed in one patient during an examination often undergo changes even the examination is completed. At one point, the patient may become completely delusional, and after some time may be quite critical and analytical. This gives rise to an essential question: which of these states is his real state? How to understand this patient? How to help him? What is the role of art, and how can it help the patient to overcome his disabilities? The purpose of this article is to suggest at least partial answers to these and other questions.

CREATIVITY AND BRAIN DAMAGE

Since the publication of the famous work by Bogen and Bogen (1969), in which the authors advanced the idea that the main obstacle to creativity is the inhibition of the function of the right hemisphere by the left hemisphere, there have appeared hundreds of works devoted to the study of creativity (see Kaczmarek, 1991; Nikolaenko, 2003; Pąchalska et al., 2008; Piechowski-Jozwiak & Bogousslavsky, 2013). Many studies indicate that the two hemispheres of the brain complement each other in the course of mental functions, including cre-

³ It should be added that Prof. Adam Pąchalski was the author or co-author of several new approaches to the rehabilitation of disabled persons, including brain-damaged patients. A good example of this is his pioneer model of rehabilitation planning (called named Plan-Rehab Program 1), developed in accordance with a goal-oriented, strategic approach, which was applied in the rehabilitation of brain-damaged and hemiplegic patients. The program takes into account the goals which the patient wants to achieve (Pąchalski i wsp., 2004), and includes art therapy (see Pąchalska, 2008).

⁴ The AAA Syndrome may occur after organic brain damage. It consists of (1) aphasia – connected with disorders of language functions, (2) apraxia – impairment of precise goal directed movements without symptoms of paresis, cerebellar impairments, or sensory disorders, (3) agnosia – disturbed ability to recognize well known elements in the patient's surrounding, with well preserved sensory apparatus.

ativity (Egorov, 1986). On the other hand, Warrington et al. (1966) suggested that the creation of an artwork is based on the work of only one hemisphere. Studies of artists with various brain injuries could be helpful in solving these problems. Many scientists have tried to understand how artistic thinking is supported by the structure of the brain, and what changes occur in artistic creativity following brain damage.

A cohort study of the functional asymmetry of the human brain in patients with psychiatric disorders and neurological diseases, with particular emphasis on the visuo spatial and linguistic functions of the right and left hemispheres of the brain, after electroshock therapy administered to one hemisphere of the brain, revealed the mechanisms of interaction of both hemispheres of the brain (Nikolaenko & Pąchalska, 2008). For example, the analysis of drawings of psychiatric patients with unilateral electroconvulsive suppression of the left or right hemisphere allows us to conclude that each hemisphere of the brain has its own model of the world. The mechanisms of the isomorphic direct perception of reality based on a system of direct images are associated with the right hemisphere, while the left hemisphere creates a symbolic system, which provides a conceptual representation of reality. In consequence, the main principle of interpretation of the world lies in constant interaction and interference between these two systems (nonverbal and verbal). The study revealed the existence of different patterns of artistic creativity in persons with suppression of the left or right hemisphere, due to the disinhibition of one or the other of them (see also Kaczmarek, 1991; Pąchalska, 2013; Pąchalska et al., 2014). The interaction between the activities of the cerebral hemispheres and artistic ability are summarized in Table 1.

These studies have yielded knowledge about hemispheric asymmetry and different patterns of creativity by the right or left hemisphere of the brain, but do not give a full view of the disorders following injuries to the frontal and posterior

Table 1. Characteristics of representation in the left and right hemispheres

| LEFT HEMISPHERE | RIGHT HEMISPHERE |
|---|---|
| Conceptual representation (concept) of the object | Representation of the object itself |
| Using symbols | Using images |
| Geometric representation of objective space (technical drawings, methods, plans, solutions) | Representation of the geometry of visible space (creating the illusion of depth on a plane surface) |
| Representation of distant space (direct perspective, distant point plan) | Representation of close space (reverse perspective, near point of view) |
| Dividing space with binary opposition: up - down, left - right, and then building overall spatial relationships | Whole, regular, and consistent structure of visual space, and then the creation of integral symmetric forms |
| Preference for the right field space | Preference for the left field space |

areas of the brain. Moreover, they do not tell us much about the progressive disorders, including subcortical structures. Such knowledge can be gained by studies on the creativity of people with neurodegenerative diseases, with a particular focus on frontotemporal dementia and Alzheimer's disease.

ARTWORKS AND DEMENTIA IN NEURODEGENERATIVE DISEASES OF THE BRAIN

There have been many works devoted to the influence of dementia on artistic creativity (Piechowski-Jozwiak & Bogousslavsky, 2013; Pąchalska, 2013). Authors often— describe what is going on with the work as a process, not taking into account – a serious oversight – the pathomechanism associated with the emergence of dementia in these artists, as well as the phase of the disease which changed the style of their works or caused the appearance of pathological feature. The relationship between the pathology observed in the work (e.g. drawings) of artists who suffer from the same kind of disorder has been studied on a sufficiently large population (see Kertesz 2011).

Frontotemporal dementia (FTD) is the most common name now in use for what was once called “Pick's disease”(PID)⁵. The concept of FTD includes a clinically, genetically, and morphologically heterogeneous group of neurodegenerative disorders (Pick, 1892; Kertesz & Munoz, 1998; Szczeklik, 2005). Kertesz (2011) notes that it includes about 12-15% of all cases of dementia, and 30-50% of cases with early onset of symptoms. The cause of FTD is progressive, selective but not focal damage to the frontal and temporal lobes (Bidzan 2012). Changes in such a large and complex area cause considerable variation in the clinical picture in individual patients. These areas are responsible for:

- processes related to decision-making and control of behavior (frontal lobes);
- emotional and linguistic features (temporal lobes).

In the clinical picture of FTD, a variety of neuropsychiatric symptoms can be observed, including behavioral problems and/or progressive language problems. In addition, extrapyramidal symptoms are observed in cases of Corticobasal Degeneration (CBD), Progressive Supranuclear Palsy (PSP), and Motor Neuron Disease (MND). Based on a large cohort of patients with FTD, Kertesz (2011) divides FTD into:

- the behavioral variant (bvFTD);
- the linguistic variant (lvFTD);
- variants of primary progressive aphasia
- nonfluent (nfvPPA)
- logopenic (lvPPA)

⁵ The eponymous term may be preferable, due to its obvious analogy with Alzheimer's disease (AD), and for historical accuracy. Many caregivers object to the term “dementia,” and “disease” is beginning to be used instead. Arnold Pick described the clinical picture of lobar atrophy more than a century ago (Kertesz 2011).

- semantic dementia (SD) or semantic primary progressive aphasia (SVPP). Kertesz enumerates the following behavioral symptoms:
- indifference;
- disinhibition;
- hyperorality (placing objects in the mouth, or excessive, indiscriminate eating);
- hypersexuality (mostly words and gestures);
- compulsive touching (also called utilization behavior);
- disinhibited exploration of the environment (roaming).

The characteristics of PPA may include agrammatism, logopenia, anomia (difficulties in naming), or semantic aphasia, also called Semantic Dementia (SD). Naturally, the clinical symptoms depend to a large degree upon the area of brain degeneration, and possibly also on the nature of the changes⁶.

Three consecutive stages of Frontotemporal Dementia (FTD), as well as Dementia of the Alzheimer Type (DAT), can be distinguished. A full description of the differential diagnosis is presented by Pąchalska (2012). Analysis of the data from a number of studies shows that the pattern of deficits in FTD consists mainly of behavioral, language and cognitive function disorders, including visuo-spatial and executive dysfunction, while in DAT disturbances of memory and visuospatial functions are more often observed (Kertesz & Munoz, 1997; Harciarek & Jodzio, 2005; Barcikowska, 2007; Bidzan et al., 2008; Kertesz, 2009; Grochmal-Bach et al., 2009). The intensity and nature of the clinical symptoms often differ, depending on the severity of the degenerative changes (Bidzan, 2012) and the cognitive reserve (Pąchalska 2008, 2011).

Many years of research have shown that the behavioral or linguistic manifestation of the ongoing neurodegenerative process affects the neurobiological substrate, including location changes and the dynamics of dementia (see Kertesz, 2009; Bidzan, 2012; Harciarek, 2012; Pąchalska, 2012). With time the disease inevitably progresses to include more and deeper areas of the brain, which leads to the emergence of new clinical pictures. The nature of the mental functions affected by the process at an early stage of the disease has a profound impact on social functioning, quickly making the patient incapable of independent living (Bidzan, 2012).

Naturally, the picture of observed symptoms varies and may be considerably prolonged, but sometimes patients who develop pathology in the basal ganglia or have MND progress quickly, and develop swallowing disorders and choking. Mutism has been considered characteristic of PID, and tends to be the end-stage of all forms of FTD, even those that begin with behavioral abnormalities rather than language disturbances. Mutism also occurs in the end-stage of AD, but usually in patients who already have a global dementia with a loss of comprehension and

⁶ The genetic etiology of FTD has been stressed in many scientific papers. The Tau protein is often found, along with mutations of progranulin into CH-17. Kertesz (2011) writes that less than half of cases of frontotemporal dementia are tautopathies, as is also the case in Alzheimer's dementia. In a vast majority of cases ubiquitin positive TDP-43 is noted. Current research has also revealed FUS proteinopathy, which is common with ALS. These new discoveries open up possibilities for pharmacological treatment of FTD.

basic functions of daily living. In FTD and PPA, mutism occurs with relative preservation of comprehension, unlike in global aphasia or in severe AD (Kertesz, 2011).

It is worth asking, then, what happens to the creative abilities of these people. Can art help them to lead a better and easier life, despite the progression of their disease?

Budrys et al. (2007) reported a tragic case of a well-known artist who died because of a rare variant of FTD characterized by degeneration of neuron gussets (neuronal intermediate filament inclusion disease, NIFID). Her illness began at the age of 38. The initial symptoms consisted in a change of behavior with apathy, loss of drive, and flat affect. In a neuropsychological evaluation, the authors found aphasia, amnesia, echolalia, and verbal and motor perseveration. Abstract thinking was also impaired, and disorientation in time and space was noted, along with hemispatial neglect. The symptoms gradually grew and intensified her helplessness. She lost the ability to speak and could not perform most activities of daily living (such as preparing a meal or taking care of her own hygiene). These symptoms were joined by rigidity, hypokinesia, paraparesis, and right-arm weakness. Just before death, she stayed in bed with a fixed fetal position. She died due to pulmonological complications. Neuroimaging confirmed progressive frontotemporal dementia, and caudate atrophy. Gross pathological examination showed degeneration of the corpus striatum, thalamus, and pyramidal layers of the hippocamp. Detailed histopathological examination confirmed the NIFID variant (see Piechowski-Jozwiak & Bogousslavsky, 2013).

Budrys et al (2007) note that the works of the artist were transformed with the progress of illness from purely abstract compositions into concrete and symbolic works. Many symbols representing aggression can be found there. For example, soft and elegant colors, with a predominance of blue-green color, changed into raw and dry colors, a juicy red, as well as sharp blue and yellow. She started to use an unusual red color, which was interpreted as an expression of inner fear and a request for help (see Piechowski-Jozwiak & Bogousslavsky, 2013). Art allowed the artist to express herself and her feelings, which was not taken into account (Budrys et al. 2007). It should be stressed that art performed a communicative and adaptive function in this case, which was of great importance for the quality of life of the patient (see Pąchalska et al., 2014).

In the case of Semantic Demntia (SD), we are dealing with selective impairment of semantic memory, which causes anomia (naming problems), difficulty with understanding the meaning of individual words and expressions, and a gradual reduction of the total resources of conceptual knowledge⁷. The importance of language in understanding the world around us has been pointed out by many authors (see also Kaczmarek, 2005). They have emphasized that the ability to name allows us to sort the impressions that come to us into a coherent whole.

⁷ The clinical symptoms (including language deficits) observed in patients with semantic dementia, in whom neurodegenerative changes spread out to include the whole brain, result not only in disruptions of linguistic and nonlinguistic functions, but lead gradually to the loss of consciousness (cf. Pąchalska, 2013).

At the same time, language makes it possible to introduce order and hierarchy into the changing kaleidoscope of the environment. According to the Sapir-Whorf hypothesis (Whorf 1956), if we are not able give a name to certain things or events, they do not exist for us.

CASE STUDY

One day a prominent Cracow painter, S.D.⁸, surprised his partner, with whom he shared a house, when to her request to turn on the TV in order to watch, he replied, "What's television?" In the course of the next several weeks S.D. lost the ability to understand the meaning of a number of commonly used words. He was upset when he could not remember the name of an object or animal. His disorder was so strange that friends called him "hysterical." After a few months he was diagnosed with Alzheimer's Disease. However, it quickly became clear that his difficulty in recalling names was not typical for his age – he was only 43 years old – or similar to the memory impairment seen in the early stages of Alzheimer's Disease. The selective loss of words was perplexing to the patient himself, to his friends, and to his doctors. Some believed that he was simply making jokes.

The disease progressed rapidly, so that soon the painter had to change his lifestyle, because he was not able to converse with his friends in the coffeehouse he used to frequent, due to his inability to remember the right words. Moreover, he could not understand the course of rapid conversation, he did not understand the text in newspapers, or messages in TV, or film plots. Despite his memory difficulties his speech was still quite fluent. He was prescribed antidepressants by his doctor, but this did not bring any improvement.

Two years after the onset of the disease, a further intensification of symptoms was observed. There were disorders of semantic memory and difficulty in naming objects, without disturbances of perception, and difficulty in solving non-verbal problems. The other components of language were relatively well-preserved, especially syntax and phonology; speech was fluent, and grammatically correct. Repetition and understanding of short commands was preserved, although in spontaneous conversation difficulties in recalling the names of friends could be noted. The patient had forgotten even the name of his partner. Successively he developed difficulty in assigning images or words to a category and describing the differences between them (e.g. sort dangerous animals from not dangerous). A few months later, the patient had problems with lexical classification (e.g. sorting animals into "living on land," "flying in the air," and "swimming in the water") and differentiation at a higher level of abstraction (e.g. real and artificial animals). Still, this last type of knowledge - we may call this "school knowledge" – stayed with him longest.

MRI studies revealed temporal lobar atrophy, significantly larger on the left side of the brain, and SPECT showed a hypoperfusion in blood flow through the temporal lobe, also significantly larger on the left side of the brain. As pointed

⁸ Initials changed at the request of the artist's partner.

out by Kertesz (2011) and Pąchalska et al. (2011), atrophy of these brain structures correlates with the observed clinical picture of the patient.

After three years of duration we found difficulty in remembering the meanings of commonly used nouns. For example, the patient was not able to understand the meaning of places he used to frequent or live. Thus, when he was asked for the name of the province in which he lived, he answered:

I do not know... I am not able to remember what a province looks like.

In contrast to observed semantic memory loss, personal episodic memory was well preserved. He recalled a visit of his friend, the restaurant they went to together, and the food he ate. He could drive a car and do some shopping with the help of a list. Gradually, however, he developed executive dysfunction syndrome. The patient also lost the ability to drive, because he was not able to interpret correctly many road signs. He was not able to cook meals any longer, since he did not understand the inscriptions on the labels, and he forgot the names of a variety of vegetables and spices. An MRI performed at the time showed greater atrophy in the left hemisphere of the brain (Fig. 2).

After four years of illness the patient lost his independence. He had impaired memory of recent events and was disoriented in time and space (as often happens in Alzheimer's disease). He also developed a personality disorder and behavioral problems (as in the behavioral variant of FTD). The patient could not adequately respond to emotional stimuli (e.g. he was laughing at his mother's funeral).

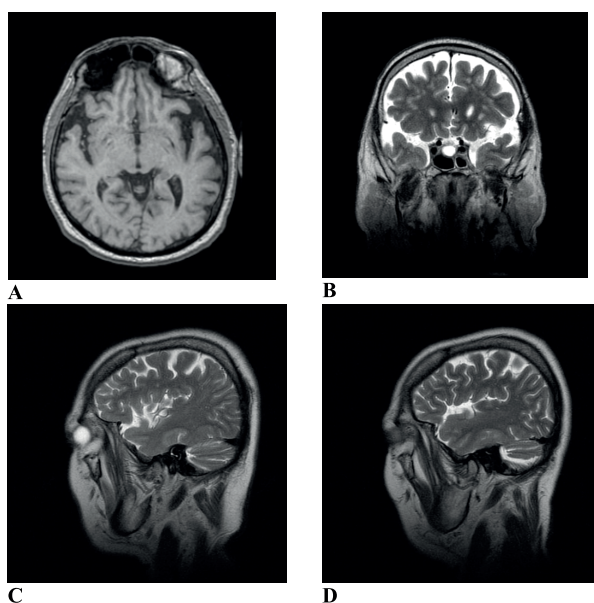


Fig. 2. Brain MRI of S.D., 43 year old artist. A – 1 SET sequences, transverse plane. Asymmetrical cortical atrophy in the vicinity of the left temporal lobe. B – FSET2 sequences, frontal plane. Asymmetrical cortical atrophy in the vicinity of the left temporal lobe. C – FSET2 sequences, sagittal plane, left temporal lobe. Cortical atrophy in the left temporal lobe (larger) and in the left frontal lobe (discrete). D – FSET2 sequences, sagittal plane, the temporal lobe. Cortical atrophy in the temporal lobe, right (larger) and the right frontal lobe (discrete)

During this time we observed the development of the Klüver-Bucy syndrome, which meant that subcortical nuclei including the amygdala, had also suffered damage (see Kertesz, 2011). The patient manifested:

- loss of natural fear (e.g. burned his hand in boiling water);
- hyperactivity (e.g. wandering back and forth across the room);
- hypersexuality (e.g. increased sexual desire and frequent masturbation);
- hyperorality (e.g. the tendency for insert into the mouth objects that are not intended for eating);
- prosopagnosia (e.g. the inability to recognize objects and familiar faces).

He continued to speak fluently, but his speech was empty and lacked significant nouns. Once, when looking at a helicopter landing in the courtyard of the Cracow Rehabilitation Center, he said:

It is fascinating that such a thing, impossible, somehow behind this, I would have thought that all these facts are presented heterogeneously and that is why such a thing is impossible, somehow behind this, so to speak, always at times, you know as it is and how it happens.

The patient gradually lost criticism. For example, he developed a certain rigidity related to the choice of meals, and mostly ate large quantities of donuts. He did not know the value of money and other belongings, so he gave away both money and paintings to his friends, or even unknown people. Finally, he went bankrupt, and his partner left him. When he described this fact to the therapist, he laughed loudly, and was not able to realize what this fact means. Finally, he was legally designated unfit to manage his property.

However, this artist, a painter, preserved the ability to recognize and name colors for a relatively long period. Despite the progression of his illness, priming was helpful in recalling the name of a given color. This means that the semantic association of colors was weakened, but not completely abolished (as is the case in Alzheimer's disease). We observed that the ability to recognize and name the color red was preserved for a long time. The patient had a penchant for all things red. For example, he poured coffee with milk and ketchup and then drank it. At this stage of the disease he used red color excessively in his paintings, so that we used the name "red stage" to denote this period of his artistic activity. In a later period of the disease, his semantic knowledge disappeared entirely. He showed a severe anomia, and he was unable to draw any recognizable objects.

Vocabulary decreased to a few words and phrases, and only highly stereotyped grammatical structures were preserved. Perseveration escalated in verbal and motor activities. The growth of the typical symptoms of dementia, including PEMA syndrome⁹, could also be noted along with the progression of his illness. That is:

- palilalia (involuntary repetition of own words, or syllables);
- echolalia (involuntary repetition of words spoken by the interlocutor);
- mutism (the condition of being unable or unwilling to speak);

⁹ Syndrome PEMA: palilalia, echolalia, mutism and apathy (cf. Kertesz, 2011; Pąchalska, 2013).

- apathy (absence or suppression of passion, emotion, or excitement, manifested as the lack of interest in or concern for things that others find moving or exciting).

In the spring of 2009, four months before his death, the patient's condition deteriorated. He developed severe apathy and later severe dementia, as tested by the MMSE. He departed from the real world, and was not even able to recognize his own face in the mirror, so he sometimes screamed at its sight in the mirror. His vocabulary narrowed to a few words and phrases. He evinced considerable difficulties in the perception and evaluation of ambient reality. For example, he gave a loud shout at the sight of a particular object, although he could not recognize it or name it. Initially auditory hallucinations appeared, followed later by visual ones. The hallucinations were probably associated with progressive, generalized brain atrophy and cognitive impairment, including language.

The patient became unable to understand utterances directed to him and to read labels¹⁰, which resulted in a severe limitation of his everyday functioning. He was not able to brush his teeth without help or eat a meal by himself. Subsequently mutism developed. The patient was not able to handle his own needs and was admitted to a nursing home. He died two months later. A post mortem histopathological examination revealed degeneration of cortical and subcortical structures of the brain with ubiquitin inclusions, TDP-43, which is typical of FTD (see Kertesz, 2011).

Before his illness, S.D.'s paintings were classified as abstract expressionism, in that his works depicted chaos with a focus on form. After he became ill, his style changed, and he began to paint symbolic paintings. Initially, these works were dominated by elegant colors with a predominance of gray and blue-green. The symbols he used represented a considerable amount of aggression and anxiety, as well as disease-related survival (Figure 3A). After two years of illness, as the disease progressed, his paintings gradually revealed changes resembling those described in the literature on neuropsychological disorders associated with damage to the right hemisphere of the brain, with fragmentation of objects and constructive apraxia (see Fig. 3B, 3C).

After three years of illness, the patient tried to reproduce the works he had made in the previous stages of his creativity, and complained that he could not paint any longer. At the beginning of this stage, the patient used sharp yellow and bright red colors in his paintings. As the disease progressed, he began to draw cephalopods (Fig. 3D), and later he was producing only bright red daubs, but still expressed satisfaction that he had made a nice picture. This activity disappeared after he developed mutism.

¹⁰ Automatic reading was preserved but the patient did not understand the text he had just read (see Pachalska, 2013).

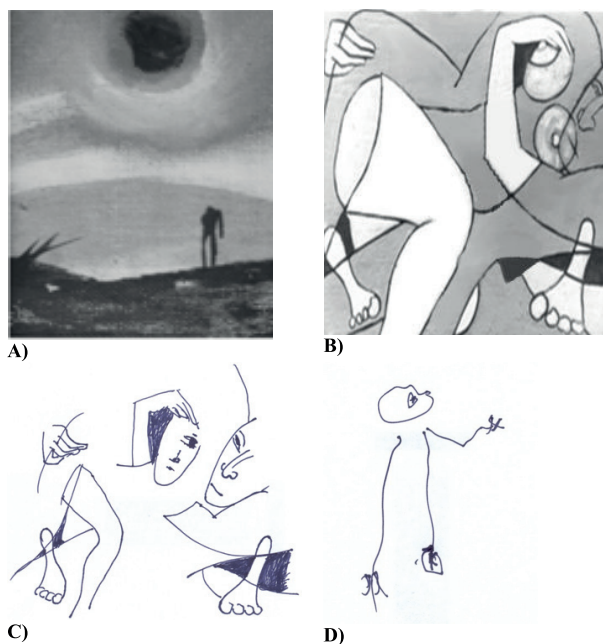


Fig. 3. Four works painted by S.D. A) A painting called “Above the abyss,” made shortly after onset. B) A painting entitled “Erotic Scene,” made one year after onset. C) A figure entitled “My illness,” made two years into his illness. D) A drawing with no title made three years after onset.
Source: authors’ own material

DISCUSSION

This case study of the artist S.D. has provided some basic knowledge, not only about the patient himself, but also on the linguistic and neurological disorders observed in FTD (Kertesz, 2011; Pąchalska, 2013; Pąchalska et al., 2014). Despite pharmacological treatment, the degenerative process proceeded all the time. At first the damage involved mainly the left hemisphere, which resulted in symptoms characteristic for dysfunction of that hemisphere (see Table 1). The extension of neurodegeneration to the right hemisphere caused the appearance of a new style of creation. When the neurodegenerative changes extended to the posterior areas of the brain, his drawings became simplified, schematic, and exhibited a variety of characteristics of pathology. Such changes have also been observed in painters with Alzheimer’s disease (Piechowski-Jozwiak & Bogousslavsky, 2013).

There have been several reports of a change in the style of painting and the occurrence of various disorders after the onset of such neurodegenerative diseases as Parkinson’s disease (see also: Pąchalska, 2013) or Alzheimer’s disease (Pąchalska, 2008; Piechowski-Jozwiak & Bogousslavsky, 2013). A style change was also observed after the onset of Parkinson’s disease in Salvador Dali, the greatest surrealist artist and one of the great masters of art of the twen-

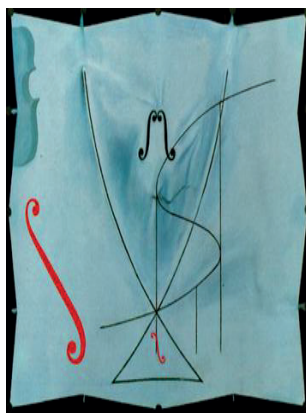
tieth century. Dali is usually regarded an extreme eccentric who invented his own “paranoic – critical method.” He created pictures that upset the logical order of reality. They were often visions of the grotesque, the borderline between reality, dream, fantasy, and hallucination. After falling ill with Parkinson’s disease in 1980, he moved away from reality, and died after nine years of illness. According to the critics he also changed the style of his painting after two years of illness. For example, he painted the work “Exploded head”, which is one of his most perverse artistic productions. Not only is the title provoking, but also the esthetics of the material contrasted with the physical excesses that signaled disorder caused by disruption of consciousness. It is a projection of the author’s anxiety associated with the disease (Fig. 4A). After three years of illness, Dali also painted works that are characterized by simplification and schematization. This style can be seen, for example, in his last painting, entitled “The Swallow’s Tail” (Fig. 4B), made in 1983 (six years before his death), which depicts great anxiety.

After completing this work he brought his brilliant artistic career to an end. However, he did not receive any stimulation in the form of art therapy, even though painting was his entire life, and the expression of the disease allowed him, as we see in his late paintings, to “spit out” the negative emotions associated with various incomprehensible symptoms of the disease (Pąchalska, 2013).

A change of creative style was also observed in a well-known Polish artist specializing in painting historical and battlefield works. The favorite subjects of her paintings were horses painted in realistic colors. She became ill at the age of 47 with the behavioral variant of FTD, as confirmed by a histopathological examination performed after her death. At the onset of the disease, she often sketched horses, which she usually left unfinished (cf. Fig. 5A). A few months after onset her painting style changed in the process of art therapy. For example,



A)



B)

Fig. 4. Two paintings by Salvador Dali. A) “Exploded head” (1982; see text); B) “The Swallow’s Tail” (1983), his last painting (see text)

Source: Pąchalska, 2013

the painting entitled “The Weeping Lady” is made in dark purple. The artist inscribed here the phrase “boli” (“it hurts” in Polish), with obvious perseveration. She explained that things are very bad, because she had fallen ill with an unknown, incurable disease (Fig. 5B). It is worth noting that at that time perseverations were also observed in the patient’s behavior, writing, and speech, which points to damage in the frontal lobes (see Kaczmarek, 2005). In the next phase of the disease, the gradual development of the disinhibition characteristic of frontal lobe syndrome was most marked. This was also reflected in her drawings, which often included sexual elements, or in comments expressed orally and/or in signatures. After painting the figure “Desire” representing a mare (Fig. 5C), she laughed and commented on the needs of the painted animal, using obscenities, which is typical of people with disinhibition. There was a more pronounced change in her work after unilateral hemianopsia appeared, which was confirmed during neuropsychological examination (see Fig. 5D). After the injury had spread to involve also subcortical structures, she entered into the “red stage.” At that time she painted, like S.D., bright-red daubs and flourishes reminiscent of the doodles created by children at a certain stage of development (cf. Fig. 4B; see also Pachalska, 2013). Shortly before the onset of mutism she painted red stains on the tablecloth with ketchup.

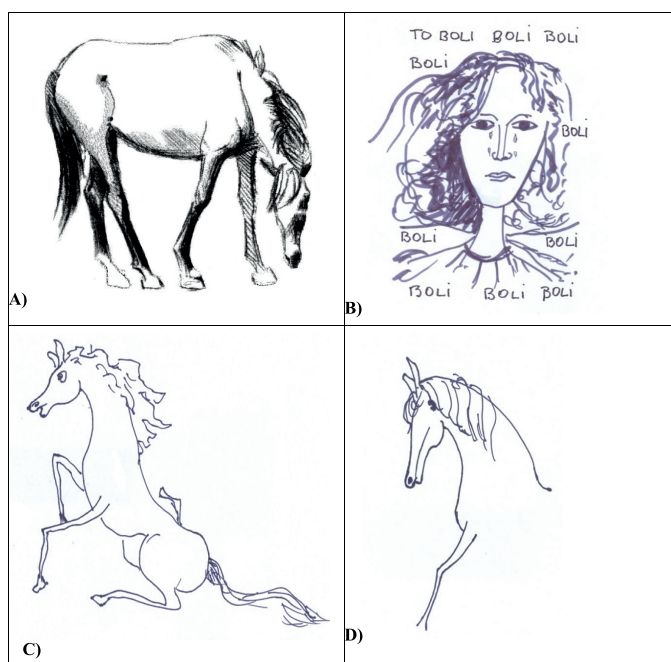


Figure 5. Four works made by the artist-painter BW. A) Sketch for a painting entitled “Idyll,” made shortly after onset; B) A painting entitled “Weeping Lady,” made one year after onset; C) A drawing named “Desire,” made after two years of illness. D) Work without title, made three years after onset
Source: authors’ own material

In the literature one can find similar examples of changes in the style of painting. This certainly pertains to Willem De Koonin, a well-known American painter of Dutch origin, a representative of abstract expressionism. In 1940 he was a member of the mainstream group of abstract expressionists, along with Mark Rothko, Jackson Pollock, Franz Kline, and Arshile Gorky. His paintings were characterized by a bold technique and symbolism, as well a degree of figurativeness unusual in an abstract expressionist. Unusual colors, bare teeth, flabby breasts, dull eyes - all showed a man's sexual fears and the darkest aspects of Freud's theory. As in the case discussed here (S.D.), the theme of his works was chaos, with an emphasis on form. He received the title of "the most expensive living painter" during his lifetime (Stephens et al., 2004). After he fell ill with Alzheimer's disease, his paintings deteriorated, and his works become impoverished in form (cf. Piechowski-Jozwiak & Bogousslavsky, 2013).

How can we explain these symptoms?

According to microgenetic theory, the thought of an action, i.e. its mental image, temporary or long-term (permanent), is a necessary and sufficient condition for the performance of that specific action. This mental image is associated with the formation of an avalanche of other thoughts and mental states. Images are important for prompting further action: in the case of a painter, this would mean making decisions about he wants to paint. Finally, we enter into a complex series of thoughts and associated behaviors that relate directly, to the created work. The choice of subject matter or style of creation is associated with the Self, which generates thoughts and actions. This process triggers another thought and action evaluated again by the Self (cf. Fig. 6).

For a better understanding of the relationships between thinking and action in terms of microgenetic theory, it should be added that the thought is associated with the perception of the situation, and is at the same time parallel to the development of action (Brown, 2005; Nikolaenko & Pąchalska, 2008). This fact is extremely important for an understanding of the importance of impulsive actions, frequent hesitation, and consequently chaotic painting, as in the case of persons

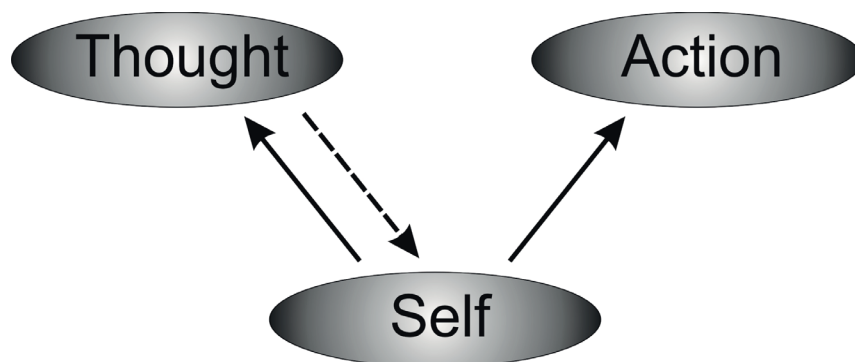


Fig. 6. Relationships between the Self and the process of thinking and action.
Source: Pąchalska, 2013

with damage to the frontal area (Brown, 2005; Pąchalska, 2008). This is due to the fact that the verbal thought prompts, turns or leads the behavior, through inhibition or stimulation of a specific action. Regardless of whether the thought is rational or irrational, it may have an impact on the creation of a painting by eliminating alternative paths. Therefore, the birth of an irrational thought, which will settle in and take possession of the mind of the painter, may cause various, often pathological behaviors. For example, the painter may include some inappropriate sexual details in his work.

Adjustment of actions to the leading role of thought, initiated by awareness and “tuned” by constraints, is difficult in some situations. Such a situation occurs in the majority of artists-painters with frontotemporal damage, which results in disturbances of planning and monitoring. It is well known that a detailed plan is required for preparing and performing appropriate action, which in the case here discussed is painting a picture.

When the impairment involves perceptual systems, which are - as we know - strongly associated with memory and language, the patient may be able to create, but his paintings reflect a variety of disorders. In the phase of the the disease when executive systems begin to decay, the patient may pass to the above-mentioned “red phase” of the disease, painting various doodles and daubs. Each of these phases gives the artist an opportunity to express themselves and to have fun. Therefore, it is hard to understand why the opportunity for artists to express themselves and their emotional experiences is so widely neglected in the world literature. Many scientists seem to forget that the possibility to create is extremely important for the quality of life in disease, particularly neurodegenerative disease. It is possible to help such patients with art therapy, which can break through the apathy and passivity, so that the patient can feel some contentment even when the work is a cephalopod (cf. Fig. 3D) or merely a daub of color, crude figures which – as we know – are drawn by children at some stage of their development.

CONCLUSION

The case histories of artists with dementia discussed above, based on the literature and our own clinical work, allow us to surmise that neurodegenerative diseases of the brain have a considerable impact upon the style of created paintings. We can observe surprisingly different results, beginning with the emergence of innovation but then progressing to the gradual loss of creativity. At the present stage of our knowledge it is difficult to draw firm conclusions on the brain mechanisms that are associated with this process. Still, the study of brain-damaged artists can yield some knowledge about the brain mechanisms of creativity for at least two reasons:

1. They allow us to better understand some of the neural bases of artistic creation and the types of changes in creative work associated with the disease.
2. It sometimes happens that the neurological disease that destroys the central nervous system leads to the emergence of innovative works, sometimes eval-

uated as an “advance” in the development of the work of already recognized artists.

Particularly fascinating for clinicians is the possibility of learning about the impact of disorders of the nervous system on artistic creation, which often results in strange, unpredictable and irrational changes. We should be careful with generalization of the observed facts, however, since each patient is an individual person, has a different life history, which results in a different pattern of illness despite the shared characteristics of the same syndrome.

Studies devoted to the creativity of artists with frontotemporal dementia show that language is a kind of guide to the perceived world. Hence the loss of language competence, even partial, leaves the person suffering from frontotemporal dementia to wander without a guide in an unrecognizable and therefore unreal world. Despite this, art still leaves the person the opportunity to express their own, unique way of seeing the world, until the late stages of the disease. Whatever the work that our patient creates, whether it is in the process of art therapy or at home, it requires approval from the immediate environment, even if they are cephalopods or daubs painted in horrible colors. Only then will the patient be able to lead a better and easier life, despite the severe illness.

An analysis of cases of recognized artists with semantic dementia justifies us in concluding that art is of great importance in the diagnosis and therapy of established artists with dementia. A careful analysis of their works of art makes it possible to better understand some of the neural basis of artistic creation, and the types of changes in creative work associated with the disease, and to assess the patient's cognitive, emotional and behavior disorders, and therefore apply better methods of rehabilitation. On the other hand, neurodegenerative disease, despite impairing the central nervous system may sometimes lead to the emergence of innovative works that may be seen as a kind of “advance” in the artist's career. In any event, the process of creating and the opportunity to express themselves, even in a limited way, allows these artists to lead a better and easier life.

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