

STROKE AND PAINTING

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Discussions about art are usually conducted without any reference to the brain, through which all art is created, executed and appreciated. Why? Art is a human activity and, like all human activities, including morality, law and religion, depends upon, and obeys, the laws of the brain. But, we are still far from knowing the neural basis of these laws¹.

Owing to Semir Zeki's anatomical and physiological studies of visual brain, and used contemporary imaging diagnostic's to study the human visual brain, spectacular advances in our knowledge of the visual brain allows us to make a beginning in studying the neural basis of visual art².

Scientific achievements in this field of neurobiology include: 1) Discovery of the many visual areas of the brain and their functional specialization for different visual attributes such as colour and motion. 2) Finding neurons in a part of the monkey visual system that would respond only when a particular colour, rather than a particular wavelength, was in their receptive fields. For example, he showed that a red-sensitive neuron would continue to respond to a red stimulus, even when it was illuminated mainly by green light. This was the first study relating colour perception to single cell physiology in the brain. 3) Showing that processing sites in the visual brain are also perceptual sites. 4) Showing that we see different attributes of visual input at different times. 5) Charting the activity of the brain in time and showing that different visual areas have different activity time courses. 6) Studying the neural correlates of subjective mental states, such as love and beauty, and more recently, hate^{2,3}.

Zeki's work has led him to believe that all major artists are instinctive neuroscientists with the innate understanding of how the human brain looks at the world. He claims they are consistently trying to

find a visual language for those concepts because, seeing is not a passive process^{2,4}.

In this context, it's described that Oskar Kokoschka painted a portrait of the eminent Swiss psychiatrist and neuroanatomist Auguste Forel in 1910 year. The painting is a remarkable psychological portrait but also appears to predict the strokes and right hemiparesis that affected Forel more than a year later. Although it is possible that Kokoschka shared a gift of psychic prediction with his mother and grandmother, a more likely explanation can be ascribed to a combination of the artist's acute perception and the presence of sub-clinical signs of stroke disease⁵.

Except that, art is an integral part of the culture's predominant mode of conceptual or symbolic construction. Painting is only one expression of a basic artistic branch that appears in the interests and preoccupations of a culture and in its multiple cognitive endeavors⁶.

Art, especially painting, is a perfect field for studying neurological processes through which the brain recognizes the beauty of a work of art⁷. "Come to introduce yourself to the exhibition" as our great poet Miroslav Antić had a habit to say.

Human brain is capable of selecting and processing from among numerous constantly successively changing data those that reflect the essence of "something". The brain does not record, it creates. From among numerous stimuli (data), it selects and separates new ones, and then compares them with the old ones already stored in memory. Humans learned to see long before they learned to speak – sight developed over millions of years. When we look at something exceptionally beautiful we cannot express our exaltation in words, but remain "speechless", and keep the pleasant feeling inside us, or we say "one picture is worth a thousand words"⁷.

The hippocampus is “the most sensitive” part of the brain, there are cells that reflect in traces personal memories of the viewer. In this way, everyone’s opinion on beauty is a result of accepting new information and of previous experience. While we look at a work of art our brain “becomes” an artist⁸.

Painting is a very complex behavior and its neural correlates involve brain areas processing the perceptive, cognitive, and emotional valences of stimuli; brain damage, therefore, could modify artistic expression. The effect of a major stroke on artistic changes as a function of the lesion type has been the subject of several reports, which have generally focused on the result of severe visuo-spatial disturbances (that is, hemispatial neglect) and aphasic disintegration. Right parieto-occipital damage resulting in spatial neglect, constructional apraxia, or perceptual agnosia can alter the spatial configuration of the whole painting or individual parts, while extensive left hemisphere damage may be responsible for simplification of detail of represented objects. Another aspect to consider is that, in a limited number of cases, brain disorders seem, paradoxically, to improve artistic expression. Painters with fronto-temporal dementia and predominant left hemisphere dysfunction generally lose their capacities of abstraction and symbolic representation, but their paintings may appear more emotional and creative⁶⁻¹⁵.

CHANGES IN ARTISTIC STYLE AFTER STROKE – Case report

Introduction

Art is one expression of the most brain variability. Visual art, a product of the visual brain with orientation-selective cells* which respond selectively to straight lines and are widely thought to be the neural “building blocks” of form perception. During ischemic stroke, diminished blood flow initiates a series of events that may result in additional, delayed damage to brain cells. Early medical intervention can halt this process and reduce the risk for irreversible complications.

Aim of paper is to demonstrate in witch form brain lesions at the beginning and after stroke may affect profoundly the artistic style.

Methods Description of the onset of ischemic stroke with all applied diagnostics procedures and different artistic style after this event.

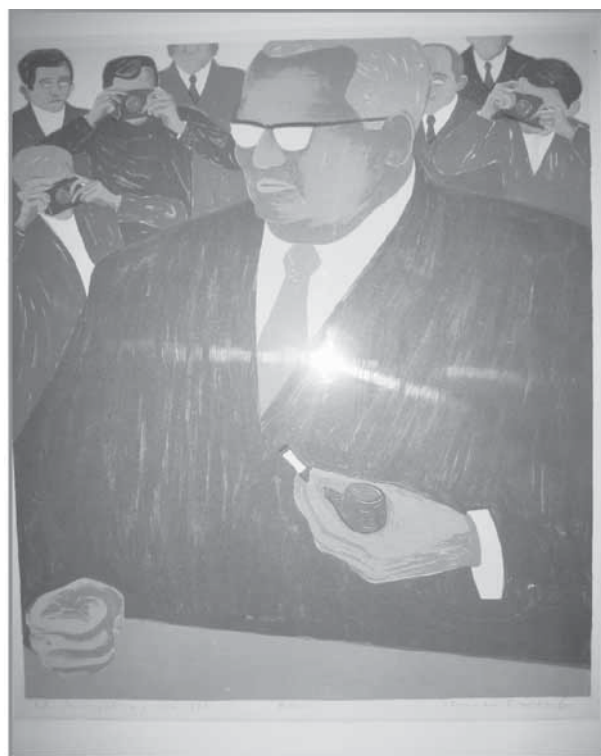
Results In painter men old 53 years describe onset of the stroke with infarction in the territory of right middle cerebral artery and with left hemiplegics syndrome. Stroke caused by both middle cerebral artery lesions, at the right side was occlusion and at the left was significantly narrow of the artery lumen, but with well collateral circulation by the vertebral artery. The anticoagulant medication was quickly applied, and after stabilization of the neurological deficit made successfully medical rehabilitation treatment. The artist continue his work, but with different artistic style.

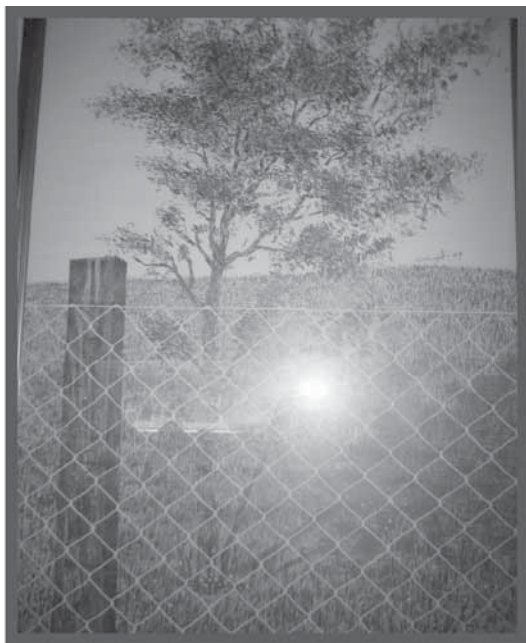
Conclusion After onset of the brain infarction in describe case was possible continue artistic work, but with changes in artistic style. Visual art contributes to our understanding of the visual brain because it explores and reveals the brain’s perceptual capabilities¹⁶.

Biographical data of painter

Lives with his family in Novi Sad. From 1964 to 2004 painting and teaching at the Academy of Fine Arts in Novi Sad. Retirement in 2004; continues to paint. Prolific painter: more than 3000 pieces over past 45 years.

Drawing before stroke from 1968, 1979 to 1985. years.





Change in artistic style.

Two paintings made after mother died 1989 and at the beginning of the illness 1989-1990, two years before of the stroke. The picture shows a figurative representation (first), oblique elements suggest violence and confusion (second picture).

Change in artistic style during 1991 half year before stroke:

Abstract expressionism pattern.

Stroke accident: Painter, old 53 years, admitted to hospital at the October 1991. with a developed ischemic stroke, left-side paralysis, somnolent.

Unaware of existing cerebrovascular disease, apart from decades-long smoking and recorded allergy to salicylates.



On admission: hypertensive, laboratory-verified hyperlipoproteinemia, hypo-HDL cholesterololemia (type IIb).

Duplex Scan of both carotid arteries showed present occlusion in proximal part of right internal carotid artery (ICA), reduction of circulation in trunk of both common carotid and proximal part of left carotid artery (left ICA: haemodynamically significant stenosis 70-80%).

Angiography to present the occlusion in proximal part of right ICA and Computed tomography showed present the ischemic stroke in the right MCA supplied area.

Diagnostic conclusion: Occlusion of the right ICA and cerebral infarctus regions MCA (supply partially by PCA – PCoA) develops when right ICA and right MCA supplied area of the brain becomes blocked by a blood clot

Comment of the expert for right brain functions: Alerts us to novelty; tells us when someone is lying or making a joke. Specializes in understanding the whole picture. Specializes in music, art, visual-spatial and/or visual-motor activities. Helps us form mental images when we read and/or converse. Responsible for intuitive and emotional responses. Helps us to form and maintain relationships.

Treatment and course

Treated with heparin in the acute phase of stroke. After a few days his condition stabilized: improved consciousness, good verbal contact, with residual left-side paralysis. Later, recovery of motor deficits; continued with oral anticoagulants.

Three-week investigation and treatment at neurology clinic was followed by two and a half months physical rehabilitation (12.11.1991-28.01.1992).