

Brief Report

Art Therapy Outcomes in the Rehabilitation Treatment of a Stroke Patient: A Case Report

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Abstract

This case report discusses the potential for art therapy to aid in the recovery of early-chronic stroke patients. The patient was diagnosed with having a subarachnoid hemorrhage from a cerebral aneurysm rupture 1 year prior to hospitalization. Therapies used as part of the patient's treatment included 10 weeks of art therapy conducted twice a week, resulting in improvements in the patient's emotions and cognition. The patient's artwork provides an especially valuable opportunity for tracking improvements in cognition not easily detected in standard rehabilitation therapy. Results from the MMSE, MVPT, and psychological tests conducted before and after art therapy treatment showed improved scores in visual perception and cognition, as well as an increase in motor activity and function as a secondary effect. This case report suggests that art therapy may have a positive therapeutic effect on chronic stroke patients.

Review of the Literature

Art therapy originated as a means for understanding psychological problems of patients related to psychiatric distress (Ulman, 1992). However, art therapy also has been found to be an important method for addressing the psychological, emotional, and communication needs of patients with such chronic medical illnesses as cerebral palsy and dementia (Malchiodi, 1999). One example of the effects of art therapy on the cognitive progress of brain-damaged patients is a study by David (2000), who reported improved attention, memory and organization functions for three brain damaged patients. Weinberg (1985) observed improved motivation and self-respect in brain damaged individuals and stroke patients who used a computer art therapy program to help them express their anger and frustration.

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Art therapy may be effective in strengthening a patient's visual-perceptual function. In a study of art therapy with children who had learning disabilities and visual-perception problems, Gair (1975) reported that the children's self-portrait drawings were greatly enhanced with respect to visual expression, as were visual reception, visual ending, visual linkage, and visual memory based on the Illinois Test of Psycholinguistic Abilities. Cheyne-King (1990) used Silver's stimulus drawings to show the positive cognitive effect of art therapy on patients diagnosed with motor aphasia due to brain damage. Wilson (2001) found that the visual-motor functions of stroke patients with communication disorders were improved by the creation of visual images.

In her study of six patients with dementia, Wald (1999) reported that evidence of organic brain injury and associated psychiatric problems may be detected in patient drawings. She also found that art therapy was a useful method for helping the patients express themselves, especially when their ability to speak was severely damaged. Likewise, in some patients with disabilities, sensory and physical impairments may distort their ability to process information. Art activities can be used to help these patients make sense of and order their experiences (Silver, 1973).

The study below focuses on the use of art therapy with a patient diagnosed with chronic brain damage who had very serious limitations in cognitive functioning in many areas, as well as decreased motor capability. The patient was treated with a comprehensive rehabilitation therapy that utilized a number of different treatments, including art therapy.

Case Description

A 59-year-old female patient, who came to an emergency room in a conscious state, was admitted to the neurosurgery department of a hospital in order to receive embolization due to a subarachnoid hemorrhage from a cerebral aneurysm. Images from computed tomography showed slight improvements in the patient's motor and cognitive functions after surgery. Over time, she received various rehabilitation therapies in several different hospitals including a stay of 68 days, 9 months after the onset of the

Table 1
Comparison of 1st Admission and 2nd Admission

	First admission (Year 1)	Second admission (Year 2)
Speech	AQ 2.0 (2%ile)	AQ 16.8 (9%ile)
Dementia	attention 1	attention 9
	initiation and perseveration 1	initiation and perseveration 2
	construction 0	construction 0
	conceptualization 0	conceptualization 18
	memory 0	memory 11
MMSE	0	0
FIM	31	41
Gait	impossible	gait with maximal assist

disease, in the rehabilitation department of the hospital where the authors are employed. After her discharge, she was hospitalized in three other rehabilitation programs elsewhere. Finally, 18 months after the onset of the disease, she was rehospitalized for 75 days and received comprehensive rehabilitation therapies that included art therapy. A comparison of her conditions following this treatment with her conditions one year earlier showed mild systematic improvements in cognitive and motor functions (Table 1).

At the start of her last rehospitalization, the patient's general medical condition scored zero (0) on the Korean version of the Mini Mental Status Examination (K-MMSE). The Korean Wechsler Adult Intelligence Scale (K-WAIS) test result showed very severely retarded cognitive capability status and a score of less than 40 (<1.5%). Her linguistic capability revealed broca aphasia based on an aphasia quotient (AQ) of 16.8, which falls in the 9th percentile, according to the Korean version of Western Aphasia Battery (K-WAB), indicating very limited linguistic communication. The Motor-Free Visual Perception Test (MVPT), which would have estimated the patient's visual perception function, was unavailable. Touching and pressing sensations could not be acknowledged by her right upper limb, and other functions were also found to be damaged including apperception, two-point discrimination, and recognition of three-dimensionality. When the Fugl-Meyer test was administered to measure the function of her right upper limb, the patient scored 6 out of a total possible score of 66, with nearly a complete inability to move her arm. In detailed categories, the patient scored 4 in reflex and 1 in each test of finger mass flexion and mass extension. The Functional Independence Measure (FIM), which assessed the patient's function of daily living, resulted in a score of 41, indicating that she required moderate assistance in eating, grooming, and dressing, but was completely dependent when toileting and bathing. The patient was able to sit alone, but could stand up only for few seconds. Without maximal assistance, the patient was limited to walking only a few steps. Tremors were not observed.

Table 2
Comparison of test results before and after treatment

Test	Full score	Before treatment (Day 1)	After treatment (Day 75)
K-MMSE ¹	30	0	6
K-WAIS ²	n/a	40	59
K-WAB ³	100	16.8	17.0
MVPT ⁴	36	unmeasurable	measurable
Fugl-Meyer ⁵	66	6	32
FIM ⁶	Between 18 - 126	41	57

¹ Korean - Mini Mental Status Examination. Dementia is indicated when the score is under 19. T
² Korean - Wechsler Adult Intelligence Scale. Higher scores indicate higher level of intellectual ability.
³ Korean - Western Aphasia Battery. Lower scores indicate greater degree of disease.
⁴ Motor-Free Visual Perception Test. Higher scores indicate higher levels of visual sensory and perception abilities.
⁵ Fugl-Meyer test full score is 66. Higher scores indicate higher levels of functioning.
⁶ Functional Independence Measure. Lower scores indicate greater degree of dependency.

To improve the cognitive function of the patient, donepezil (later replaced with galatamine) and methylphenidate were prescribed throughout her hospitalization. Rehabilitation treatment began with twice daily physical therapy to help gross motor ability and occupational therapy to help cognition, perception and the exercise of daily living functions. These initial rehabilitation treatments were followed by speech therapy and psychological therapies twice a week as prescribed in an earlier rehabilitation program. However, art therapy had not been a part of any previous rehabilitation treatment for the patient. The addition of art therapy to her program allowed for a basis of comparison that could show art therapy to be the cause of changes in treatment outcomes.

Art therapy was conducted with the patient on a one-on-one basis by the first author for 40-minute sessions twice a week. Art therapy treatment goals focused on improving spatial perception capability, color recognition, shape recognition, size comparison of objects, induction of expressed internal emotion, and improved socialization. Art therapy tasks included drawing common objects such as clocks, houses, trees, clouds, fruits, and rainbows, as well as self portraits or drawings of family members. Other therapy tasks included drawing figures after viewing pictures of houses or portraits, finding hidden or different figures in a drawing, drawing with three-point perspective, and making objects out of clay.

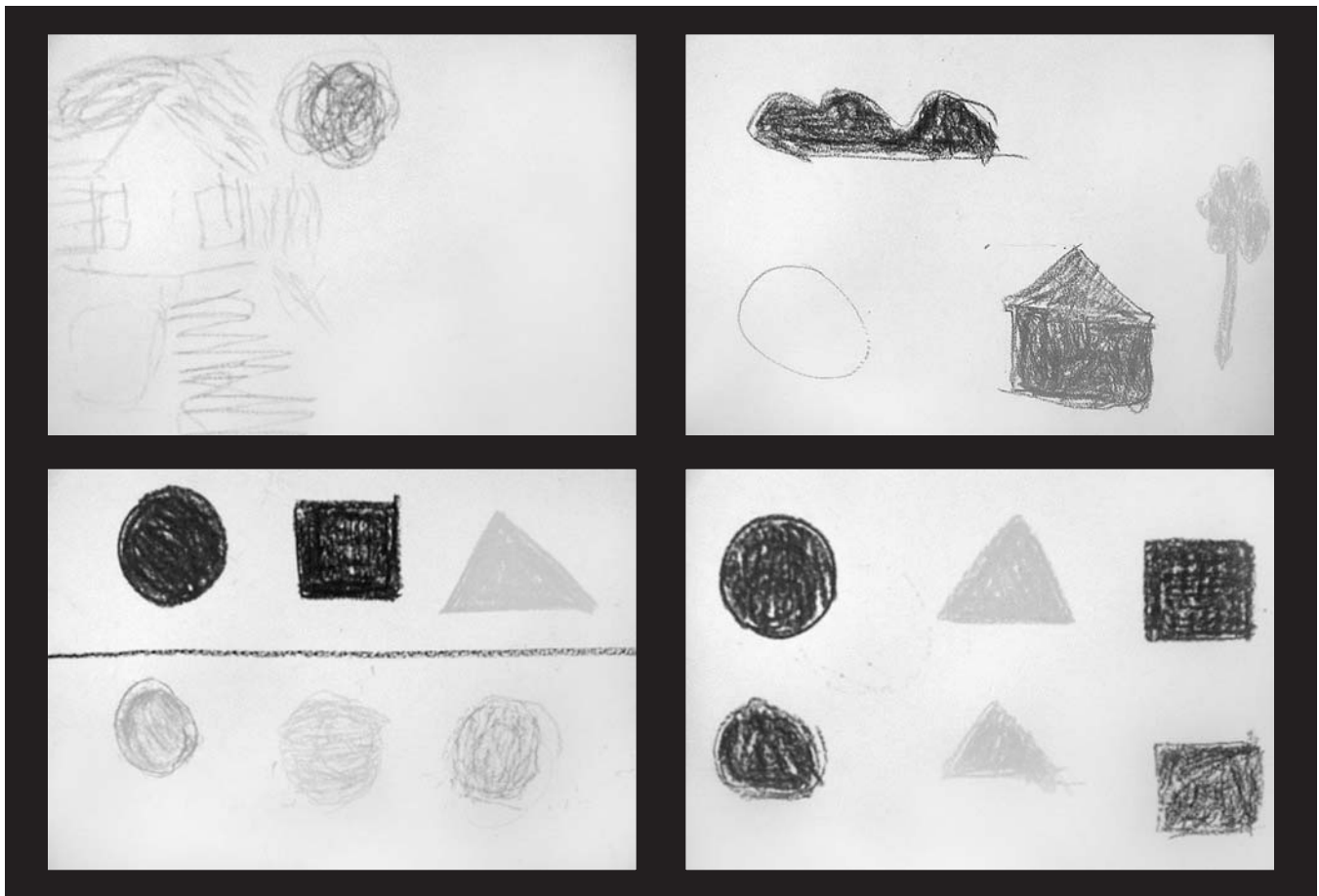


Figure 1 Before and After Drawings: Composition and Color Tone

Results

Art therapy was helpful to the patient's ability to focus and complete each art task as requested. In the initial stage of therapy, she refused to draw a figure of a person; later she was able to draw legs. From an emotional perspective, this difficulty could be interpreted as frustration with her disorder and with her inability to walk. Specific improvements over time included her ability to locate the center of the drawing paper, her perception of symmetry, her recognition of how figures are positioned in space, her perceptual ability to use space when drawing, and her ability to select colors that were appropriate or naturalistic for the items drawn. In addition, improved shape recognition and body perception were observed, as evidenced by samples that compare color and composition (Figure 1) and other spatial-perceptual aspects of her drawings (Figures 2 and 3) from before and after art therapy treatment.

At the end of the patient's rehabilitation treatment program, improvement was found in all areas of cognitive function; visual-perception capability and motor function improvement was also documented using several estimation tools (Table 2). The K-MMSE score was improved from 0 to 6, with improved scores with respect to the categories of disorientation, performance of three-step oral commands, and drawing geometric figures. The K-WAIS, conducted by

a mental state examiner, revealed that the patient's total score had improved from 40 (<1.5%) to 59. Ratings in clinical dementia showed improved attention, construction, conceptualization, and memory. Language capability did not show much improvement, but there was a slight improvement in the understanding category. Although an MVPT test could not be admitted before the therapy, overall improvement at the conclusion of therapy was shown in response behaviors and performance behaviors on both the patient's left side and her right side. She also showed improvement in processing time, although there was some decrease in the normal range of visual-perception. Finally, the Fugl-Meyer test, which assesses spontaneous movement and dynamic flexion and extension functions of the upper body, revealed a score of 32 out of a total 66, as compared to a score of 6 at the beginning of therapy. In the self-care category, the patient's FIM score showed improvement in eating, upper body dressing, and bathing. Improvements were found in walking, sphincter control, mobility, locomotion, communication, and social cognition.

Discussion

Brain-damaged patients often show anxiety, depression, and low self-esteem as a result of living with reduced capabilities caused by their condition. Art therapy can be



Figure 2 Before and After Self-Portrait

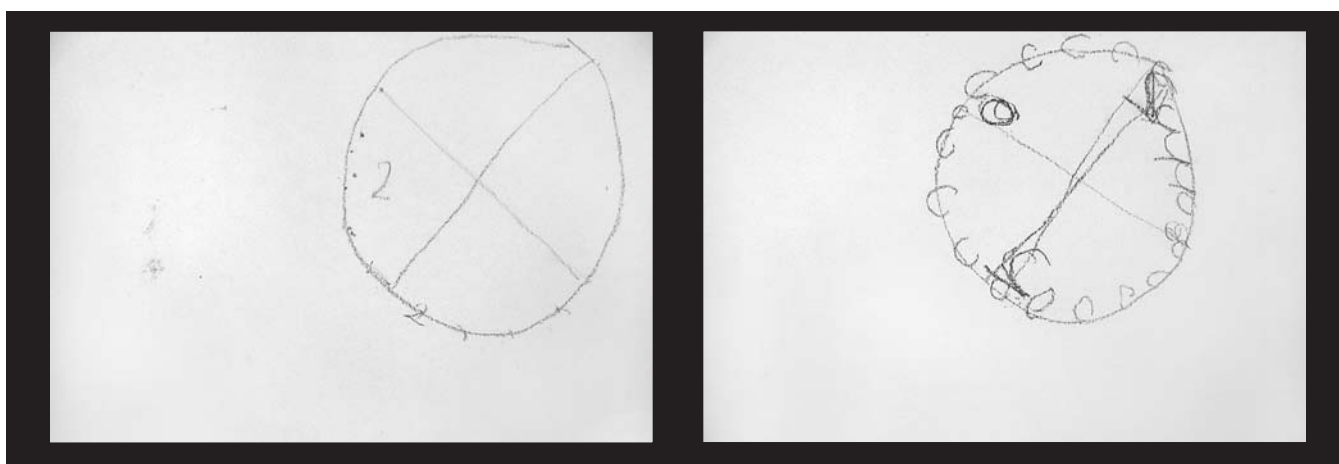


Figure 3 Before and After Drawing of a Clock

considered an effective treatment method for such patients in many aspects. When compared with other cognitive therapies that rely on a verbal approach, art therapy and its use of symbolic images is particularly suited for patients who have problems with control and cognitive dysfunction; it gives these patients alternative methods of expressing their emotions and thoughts (Kim S. H., 2006). In addition, using visual images not only stimulates deeper levels of consciousness but also releases creative and active energy as a means for relieving stress (Wilson, 2001).

Although the results reported here are based on a single case, and other therapies were part of the rehabilitation program that produced positive effects, the art therapy treatment may have been a key variable in the patient's improvement. A review of the case record showed that over the course of 18 months and several rehabilitation programs in different hospitals, there were no significant changes in neu-

rological findings until art therapy was added to the rehabilitation regimen. It is especially valuable to note that even though other therapies, medications, and family support may have helped to produce therapeutic effects, the patient's improvement in cognitive function could be directly observed in the drawings she produced in art therapy. Such effects may have been intensified by art therapy.

Art therapy is used in rehabilitation because it is thought to reduce a patient's stress and to improve the patient's overall rehabilitation motivation. In this case, the patient showed a strong motivation for rehabilitation at the initial stage but the degree of her activity slowed over the course of the next month. Her drawings suggested a tendency to withdraw from her family and her focus on the relatively large nose in her self portrait could be interpreted as a displacement of concern for her inability to care for herself or for her sexual dysfunction. In consideration of

these possible interpretations, therapists and physicians were able to provide emotional support for the patient and information on the patient's to her guardian. As a result, the patient's depressive mood slowly improved.

A second outcome of this case supports the notion that art therapy may improve cognitive function; it was possible to see improved scores on the MMSE and CDR. The patient's spatial perception capability and her visual-perception function, which allows recognition of the color and shape of objects and the comparative size of objects, could be analyzed using the patient's drawings and confirmed her improved cognition, even though these functions could not be compared with the patient's MMSE and CDR scores.

A third area of importance for art therapy with stroke patients is improved communication. A common emotion regardless of age is the feeling of recognition by another person. The sense of accomplishment and related emotions that occur when the therapist recognizes the patient's pictorially described reality is something that can result in improved communication capacity. The patient is continuously exposed to and stimulated by the integration of linguistic and non-linguistic communication in art therapy. This exposure itself may strengthen the conceptualization and integration capability of object and language recognition and expression.

The fourth outcome of art therapy in rehabilitation care is the improvement of upper limb function and occupational capability. In this respect, art therapy shows very similar results to those of typical occupational therapy. Especially through the use of clay, art therapy seems to have therapeutic effects on sensory and motor function.

Conclusion

Although art therapy has not been commonly used for brain-damaged patients in clinical rehabilitation medicine, it is a tool that recognizes the internal experience of a patient's psychological state and provides important opportunities for patients to look introspectively at themselves. Art therapy makes it possible to observe improvement in motor function and provides strong motivation for a patient to improve his or her daily living capacity, as well as

visual-perception and cognitive functions. In addition, art therapy has an advantage of easily seeing objective changes in patients' cognition and understanding through pictures and other art works. This suggests a great potential for art therapy to be utilized in the rehabilitation of brain-damaged patients.

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