

Wernicke's Encephalopathy: The Role of Vision Rehabilitation, and Related Considerations-A Case Report

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Abstract

Background: *Wernicke's encephalopathy acutely affects individuals due to thiamine deficiency. If not treated promptly, the patient will suffer neurological damage that will impair his memory, cognition, and overall psychological state, known as Korsakoff's psychosis or syndrome. Wernicke's, in conjunction with Korsakoff's psychosis, can have a devastating outcome, even leading to death. For those who survive, a myriad of long-term complications can result.*

Case Report: *A 54-year-old Caucasian woman with resolved Wernicke's encephalopathy subsequent to alcohol abuse, presented with residual visual complaints that directly affected her quality of life. She was referred by a low vision specialist for a functional vision evaluation due to oculomotor disturbances and convergence insufficiency. Due to complicating factors related to Wernicke's, vision rehabilitation was not possible.*

Conclusion: *This case serves as an example of the possible visual sequelae and ultimately the role vision rehabilitation could have in the care of such patients. Despite the inability of the patient to follow through with the recommended course of vision rehabilitation, there is a strong case for the future role of such service.*

Key Words

convergence insufficiency, malnutrition, nutrition oculomotor dysfunction, vision rehabilitation, Wernicke's encephalopathy

Introduction

Dr. Carl Wernicke first described the condition that was later named for him in 1881, based on the observation of three patients under his care.¹ The classic triad of symptoms of confusion, ataxia, and oculomotor disturbances (nystagmus and ophthalmoplegia) are actually only present in 16-38% of all diagnosed patients.² A new set of diagnostic criteria has been proposed, where two of the four following items need to be present: dietary deficiencies, oculomotor abnormalities, cerebellar dysfunction, and altered mental state/memory impairment.² When studied, this set of criteria resulted in a 100% reliability rate.³ Under-diagnosis is common however, and leads to death in up to 20% of patients. Of those that survive, 75% will progress to the related chronic form, Korsakoff's psychosis. Long-term institutionalization will be required in 25% of those patients.⁴

While alcohol abuse is often the cause, Wernicke's has been documented in other situations, all related to malnutrition, including hyperemesis gravidarum, peptic ulcer disease, stomach cancer, gastric bypass, anorexia nervosa, re-feeding after starvation, chronic hemodialysis, prolonged intravenous feeding, hyperthyroidism, anorexia, and Acquired Immune Deficiency Syndrome.^{5,6} Reversal of ophthalmoplegia is evident within hours of large-dose supplementation of thiamine.

Complete resolution occurs over days to weeks. Ataxia, impairment in mental state, and nystagmus take longer to show improvement or resolution, usually over weeks to months.⁷ There is a tendency for some amount of nystagmus to become permanent. An area of increasing concern for issues related to malabsorption is the rising rate of bariatric surgery. As bariatric surgery becomes more prevalent, the risk for malabsorptive disorders such as Wernicke's will continue to increase.

The case presented focuses on residual oculomotor deficiencies and planned remediation through vision rehabilitation. There will also be a discussion of the growing possibility of future increases in the cases of Wernicke's and the role of vision rehabilitation.

Case report

A 54-year-old female was referred to a private vision rehabilitation clinic from a low vision center for a functional vision evaluation. The patient had previously had Wernicke's encephalopathy due to prolonged alcohol consumption/abuse. When she was found in her home, she was confused and disoriented, and according to the patient, she weighed approximately 86lbs, due to malnourishment during her latest binge. After being hospitalized for an extended period of time to help restore her health, and undergoing various rehabilitations and

counseling, visual issues were uncovered. She was eventually sent to the low vision clinic that referred her to the private vision rehabilitation clinic. The referring doctor noted poor ocular motilities, convergence insufficiency, and “post trauma vision syndrome.” In addition, the referring documentation showed some visual field loss, primarily centrally (Figures 1 and 2). The refraction performed by the referring doctor on his initial encounter was OD: +1.75 -0.50 x 137 +2.25 ADD, 20/50, and OS: +2.00 sph +2.25 ADD, 20/50+3. At a follow up with the referring doctor, visual acuity of 20/40-1 OD, 20/20-3 OS, 20/20-3 OU was recorded at distance.

The patient expressed frustration with her vision, especially with keeping her place with reading and visual fatigue. She was a lawyer for a local aircraft manufacturer and was used to spending many hours reading detailed documents. She had recently returned to work part time after missing work due to her extended hospitalization and rehabilitation and was having a hard time with reading and getting the expected amount of work done. The examination data from the functional vision evaluation can be found in Table 1. Our examination findings showed oculomotor disturbances and convergence insufficiency, similar to that of the referring doctor. The diagnoses were discussed with the patient and how they related to her complaints. In addition, a treatment plan of office based rehabilitation involving oculomotor and vergence training, with integrative tasks was discussed, and the patient was scheduled for additional testing to gather some additional information. The additional testing was to include the Developmental Eye Movement test and a Visagraph recording.

Upon transferring the patient from the examination to the vision rehabilitation staff for scheduling, the patient became agitated and was verbally aggressive with the staff. Once ameliorated, the patient returned for the additional testing and conference to discuss treatment length and cost. The DEM showed she scored in the <1% range on the tracking portion of the test. The Visagraph was not performed due to technical issues affecting the equipment and testing that day. The patient agreed to begin rehabilitation, but during the initial

session, she again became agitated and verbally aggressive with the staff. The patient was subsequently lost to follow up.

Discussion

This case highlights the functional vision issues related to what could be described as a form of acquired brain injury. It is the author’s opinion that this is a reasonable position to take, given the ever-increasing knowledge that is being gained in the realm of brain injuries. It is common for someone described as having “post trauma vision syndrome” by a referring doctor to have agitation and aggression, as studies have shown that there is a link between brain injury and changes in mood and aggression. A recent Veterans Administration research paper cites that the incidence of traumatic brain injury related aggression is 34%, with a prevalence of 20-40%. This can be present in 35-96% of individuals during the acute recovery stage.⁸ Combined with the varying degrees of neuropsychosis associated with Wernicke-Korsakoff syndrome, one can see that behavioral problems can arise and impact therapy. However, this should not necessarily be a deterrent to vision rehabilitation, as any brain injury patient can have behavioral problems.

The vision rehabilitation program for a patient such as this would focus primarily on resolution of tracking difficulties and improvement in vergence abilities. There may be some limitation on the overall improvement due to the noted central scotomas for this particular patient, but there would be an expected increase in comfort and duration of reading related tasks if she had been able to complete the program. Rehabilitation procedures would include Hart Chart saccades, Wayne Saccadic Fixator, use of the Sanet Vision Integrator, Michigan tracking, and rotating peg board to work on tracking ability, progressing in a monocular to biocular to binocular fashion. Work with vectograms, loose prism pushups, computer orthoptics, amblyoscope, and aperture rule would begin after basic fixation and tracking skills improved to a sufficient level.

Figure 1: Visual Field OD

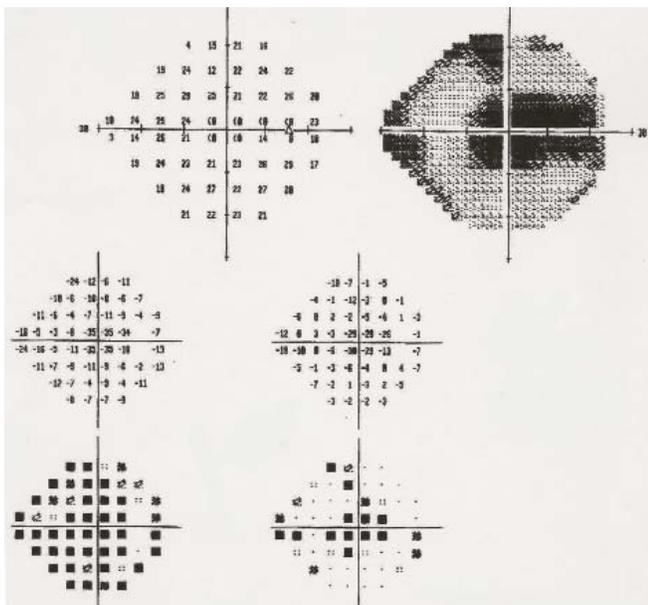


Figure 2: Visual Field OS

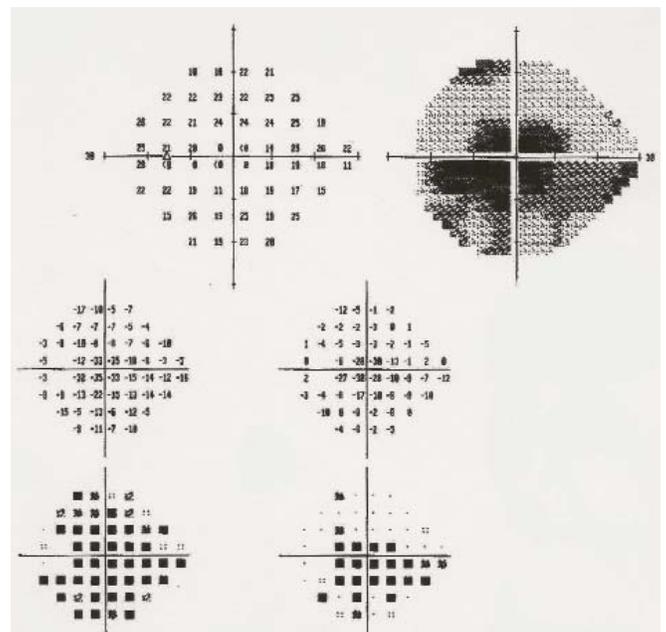


Table 1: Functional exam data results.

Test	Result
Near cover test	Low XP'
EOM testing	FROM, 1+ pursuits, over and undershoots on saccades, 1+ fixation
Near Prism Bar Vergence Ranges	BI: x/18/8 BO: x/20/0 Intermittent OD suppression
30-2 VF	Central Scotoma OD, OS
Current Spectacle RX, with acuities	OD: +2.75 -1.75 x 136 +1.00 ADD 20/40 OS: +2.25 -0.25 x 135 +1.75 ADD 20/30 OU: 20/30 OU
Auto Refractor	OD: +1.50 -0.50 x 152 OS: +2.25 -0.50 x 105
Subjective Refraction, with acuities	OD: +1.25 -0.50 x 150 +2.00 ADD 20/20 OS: +2.25 -0.25 x 135 +2.00 ADD 20/30 OU: 20/25 Near OU: 20/30

An area of growing concern both in the United States and throughout the world is the increase in obesity and subsequent diabetes. Recent World Health Organization (WHO) figures show that in 2008, 1.5 billion adults 20 and older were overweight, and of those, 200 million males and 300 million females were obese.⁹ The WHO also estimates that over 220 million people worldwide have diabetes, as of January 2011.¹⁰ This is of concern in this discussion because bariatric surgery is becoming used increasingly in the treatment of obesity. Recent studies have investigated bariatric surgery as a treatment for type 2 diabetes.¹¹ A 2006 study by Sturm reported that 13,000 bariatric surgeries were performed in the U.S. in 1998. This figure increased to over 100,000 in 2003. The American Society for Bariatric Surgery predicted 175,000-200,000 surgeries would be performed in 2006, a more than 10-fold increase in eight years.¹² In addition, Sturm notes that from 1986-2005 in the U.S., self-reported rates of obesity (Body-Mass Index (BMI) >30) increased by 30%, BMI >40 (100 pounds overweight) increased by 50%, and BMI >50 increased by 75%.¹² A review from 2009 reported that even with vitamin supplements, studies had found as many as 50% of post-operative patients had iron deficiency and nearly 30% had cobalamin deficiency.¹³ If these trends continue, it could lead to increases in malabsorptive/nutrition disorders, such as Wernicke's encephalopathy. Thus, vision rehabilitation services could find itself with a new segment of patients who could benefit from such care.

Conclusion:

As with any potential rehabilitation patient, one must consider the case and disposition of each individual. This case is used as a demonstration to show the ill-effects of brain injury, specifically in relation to Wernicke's encephalopathy, but such issues need not be a complete deterrent to providing vision rehabilitation to improve the patient's quality of life. In addition, increases in the number of people with brain

injury and nutritional disorders such as Wernicke's indicate that the number patients needing such services will continue to increase.

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