Functional Vision Loss in a Community Health Care Setting: A Teaching Case Report

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Abstract

Functional vision loss (FVL) is loss of vision that cannot be attributed to a pathological or structural cause and is often associated with psychological issues. This teaching case report will help students in their understanding of the overall role of the primary care optometrist in the diagnosis and multi-disciplinary management of a child with functional vision loss. From this case, students learn how to think critically when their exam results do not match a patient's complaint, coordinate interdisciplinary communication, effectively communicate with children and their parents about sensitive issues, and manage patients with psychosocial issues.

Key Words: *functional vision loss, non-organic vision loss, multi-disciplinary, community health, visual field, psychological, primary care, optometrist, methylphenidate*

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Background

Functional vision loss (FVL) is vision loss that cannot be attributed to a pathological or structural cause. It is often described as a diagnosis of exclusion because of the need to rule out ocular pathology. This case explains when to suspect this diagnosis, how to differentiate FVL from other potential issues, and the role of the optometrist in ensuring that ocular health is not a factor. Surrounding psychosocial factors, such as home and school environments, that can influence a child's well-being are also discussed. A careful evaluation and comprehensive response by the optometrist can make a difference in the outcome for a young patient.

This case report involves an 11-year-old Hispanic boy who presented with complaints of blurry vision. It is representative of the decision-making process for a diagnosis of exclusion, as well as the role of the optometrist in coordination of care in a multi-disciplinary setting. Third- and fourth-year optometry students and residents can benefit from this case report. The importance of obtaining an extensive case history and involving parents, teachers and health care providers is emphasized.

Student Discussion Guide

Case description

An 11-year-old Hispanic male presented on 1/11/2010 for an eye exam, reporting that he "could not see." His last exam at our clinic in 2008 was unremarkable with documentation of 20/20 visual acuity in each eye. The patient stated that this had been going on for the past year and that he had difficulty seeing the board at school. The patient's family had been unaware of any issues and brought him to the eye clinic for an annual eye exam. His older teenage sister reported that her brother recently liked "to pretend he was blind." He also reported watering and burning in his eyes.

The patient's medical history was positive for Attention Deficit Hyperactivity Disorder (ADHD) and asthma. Additionally, it was noted in his chart that he had been having a worsening series

of emotional difficulties both at home and school and he had been seeing a psychiatrist regularly for treatment. Current medications were methylphenidate, clonidine and Prozac. The patient was also followed by the Mental Health department at the health center. He had frequently not shown up for appointments with both the Mental Health department and the eye clinic throughout the previous year. He was allergic to dust, pollen and dander.

Entering uncorrected distance vision was hand motion (unable to count fingers at 1 foot) OD and OS, and the patient was unable to read the near acuity card. Ocular motility was full OU and pupils were equal, round and reactive to light with no afferent pupillary defect. The patient was unable to detect finger motion on confrontation fields OD and OS. The autorefractor showed a minimal refractive error of OD -0.25 -0.50 x 150 and OS -0.25 -0.50 x 031, but there was no improvement in visual acuity. It should be noted that he did not bump into anything as he walked around the clinic, and was able to grasp the near point card and the occluder with no difficulty. When presented with plano trial lenses, his vision did not improve.

Cover test in previous exams had shown an intermittent left esotropia of 8 prism diopters at distance and near with a cycloplegic refraction of plano -0.50 x 158 and plano -0.50 x 031 with 20/20 acuity OD and OS. Near acuities had been 20/20 OD and OS in 2005 and 2008 with no symptoms at near. The patient did not come back for follow-up as advised until now. His near point of convergence was to the nose with a penlight. Further functional testing was not pursued at this time because he was unable to see the near point card.

Examination of the anterior segment was unremarkable. The cornea was clear OU; lenses were clear OU; and angles were open OU. There were no signs of corneal staining observed OU. Intraocular pressures by Goldmann applanation were 16 mmHg and 17 mmHg at 1:45 p.m. Upon dilation, the media was clear; optic nerve margins were distinct; optic nerve rim tissue was healthy; and C/D ratios were 0.3 OD and OS. The maculae were flat and clear with good foveal reflexes OU. The periphery was intact 360 degrees OU.

The optometrist asked the patient if he liked school, and he answered that it was "all right." When the mother was asked how he was doing, she said that he had some learning issues and there would be a team meeting at school to decide how to help him. Upon further questioning, the mother reported that the patient had just started Metadate (methylphenidate) 2 months ago to treat ADHD, and she wondered whether his decreased vision was due to the medication. He had an appointment the same day with his therapist, so a note was written to the therapist, asking her to evaluate the patient's medications for potential side effects causing his vision loss. The therapist discontinued his Metadate and restarted him on Prozac to rule out Metadate as a cause of his vision loss. Given that the medication had changed, we scheduled him back for visual field testing and to follow up on his dry eye in 3 weeks.

The patient was also given preservative-free artificial tears (TheraTears) to use 1 drop t.i.d. OU for subjective reports of dryness. While there were no signs of dryness observed on examination, the patient had been taking medications that can cause decreased tear production. It was hoped that the artificial tears might provide some lubrication, as well as a possible placebo effect if this was functional vision loss. A note was written for his teacher so that she would be aware that he was dealing with significant vision problems and that he was scheduled for follow-up.

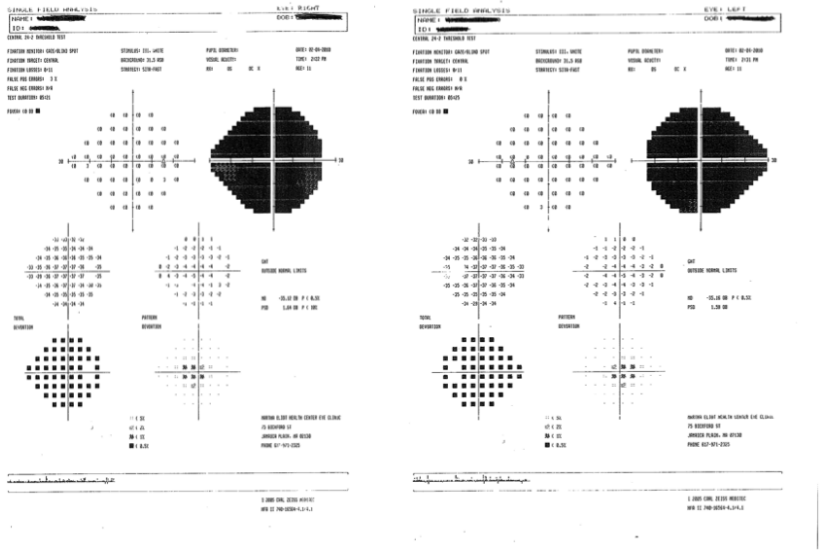
Follow-up #1

2/4/10

The patient and his mother returned for follow-up and reported no improvement in vision at distance or near. Vision was still hand motion OD and OS, and the patient was still unable to read the acuity card at near. With confrontation fields tested with finger motion, there was severe constriction 360 degrees OD and OS. Humphrey visual field testing (24-2 threshold) showed an absolute defect in both eyes in all quadrants with good reliability **(Figure 1)**. The patient was to come back in 1 month for follow-up. A letter **(Figure 2)** was written to his teacher explaining the situation, including that the patient would need special assistance knowing what was written on the board and doing his homework. Via e-mail we notified his PCP and therapist that his vision status had not improved. In the meantime, the patient continued his therapy visits. However, it had been noted by the therapist that the family had a long history of no-shows.

At this point we deferred referral for OCT, ERG or VER testing for one more follow-up because of the family's history of poor compliance in keeping appointments and not wanting to lose them to follow-up.

Figure 1
Initial Humphrey Visual Field Test Results, 2/4/10



Follow-up #2

3/22/10

The patient missed his 1-month follow-up visit and was called to return. He came 3 weeks later for follow-up. His mom reported that his vision had improved and he was now able to read for fun for 10-15 minutes at a time. Prior to his vision loss, he had good grades in school.

Entering uncorrected distance VA was now 20/50 OD and OS, and 20/30 OU. It was noted at this visit that the patient tended to mix up letters when reading the eye chart. For example, he would reverse his Ds and Bs. The patient was asked to write down the letters as he saw them, and his resulting handwriting size was roughly equivalent to a 20/80 letter size at near. He was also able to read numbers on a piece of paper at 20/80 size. A repeat of visual field testing did not show any significant improvements **(Figure 3)**, and finger-counting fields were still constricted.

The mother was asked if she had noticed him mixing up letters at home, and she said that she had observed this once in a while, but that she was not surprised because dyslexia runs in her family. The mother was strongly encouraged to request testing at school for dyslexia.

Follow-up #3

4/13/10

The patient reported no significant improvement since the last visit. He had suffered a broken leg 3 weeks prior and had to miss school. He was able to read large print with a hand magnifier that his mother had purchased at the pharmacy. The mother reported that she had requested that her son be tested for dyslexia.

Uncorrected distance VA was improved to 20/40 OD and OS, and 20/30 OU. Near VA was 20/70 OU. Loaner glasses of +0.75 sph OU and +1.50 sph OU were available, and it seemed that +0.75 sph OU for near vision helped the patient to magnify reading material so that he could read 20/40 OU. The +0.75 sph glasses were dispensed to him for temporary use, and he was instructed to use them only if they helped to magnify the words at near.

Figure 2
Letter Written to Patient's Teacher, 2/4/10

Dear Teacher:

This letter is concerning Patient X, a 12 y.o. student of yours. He came for his yearly eye exam on 1/11/10 and we found that his vision was severely decreased from the prior year. He cannot see the "big E" on the vision chart, which is worse than 20/400. We were concerned that a new medication he had started on was the cause of his vision loss, but even though he stopped the medication, his vision has not recovered. Upon further testing today, I believe that he has Functional Vision Loss, which is usually a temporary loss of vision due to psychological stress. I understand that he has been going through psychiatric counseling for ADHD, and I am contacting his therapist to suggest that he resume regular therapy.

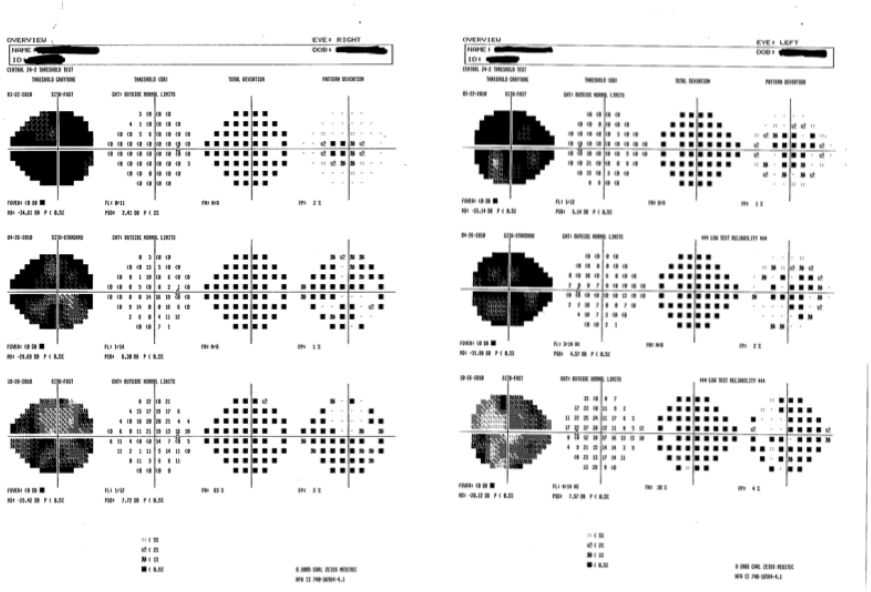
I am not certain of how long it will take him to regain his vision, but I believe it will probably be at least a couple of months, if not longer. He will probably need special assistance in school so that he can complete his schoolwork (i.e. knowing what is written on the board). I will be seeing the patient once a month to monitor his vision. I am also notifying his primary care doctor so that she can help to request special services if needed.

Please let me know if I can be of any further assistance.

Sincerely,

Optometrist

Figure 3
Visual Field Test Results, 3/22/10
(also shows progression analysis from 3/22/10 to 10/26/10)



The mother deferred a repeat visual field test because of other appointments. The optometrist emphasized the importance of keeping follow-up appointments with the psychiatrist and with the eye clinic.

Follow-up #4

4/26/10

On this visit, the patient said his vision was better, and his mom agreed, stating she had observed an improvement as well. He reported that the +0.75 readers helped him with his near work, and he was now able to see numbers on a cell phone.

Entering uncorrected distance vision was 20/25 OD and OS, and a slow 20/20 OU. Visual field testing continued to show dense defects 360 degrees with some central clearance. **(Figure 4)** The mean deviation, while still high, was improved. The patient was very distracted during testing. He was scheduled to return in 1 month for follow-up, including visual field testing.

Follow-up #5

10/26/10

The patient did not keep his 5/17/10 appointment and was lost to follow-up despite numerous phone calls to his mother from the eye clinic. He finally came on 10/26/10 for a vision check and visual field test. The patient (and his mother) reported doing better in school and being able to read books. His uncorrected vision on this visit was 20/20 OD and OS at distance and near. Visual field testing **(Figure 5)** was consistent with severely constricted fields, but the defects were significantly less dense than on previous tests. His finger-counting fields were now full OD and OS.

The patient's mom reported that they had moved to a new town and her family's stress level in general was much lower. The patient had yet to be tested for dyslexia, but the new school was planning to perform the evaluation. Since this visit on 10/26/10, the patient has not kept multiple routine eye exam appointments.

Figure 4
Visual Field Test Results, 4/26/10

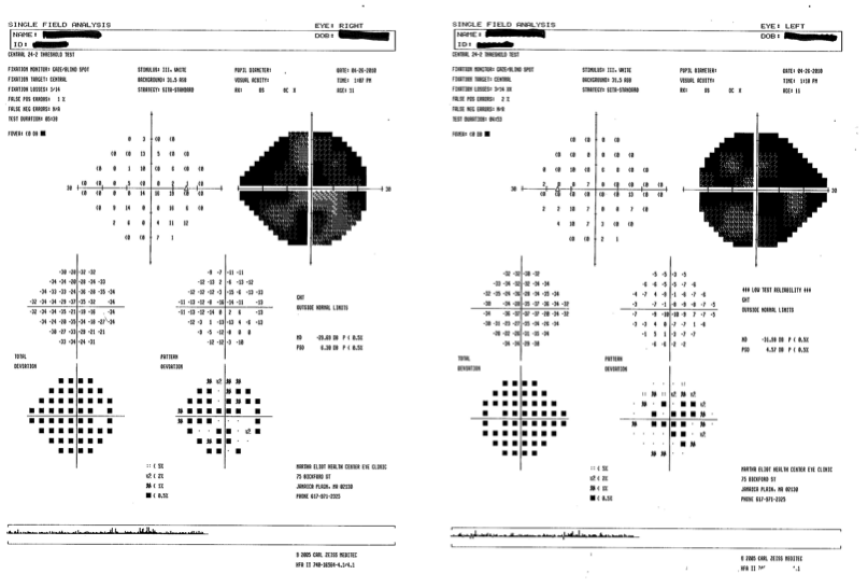
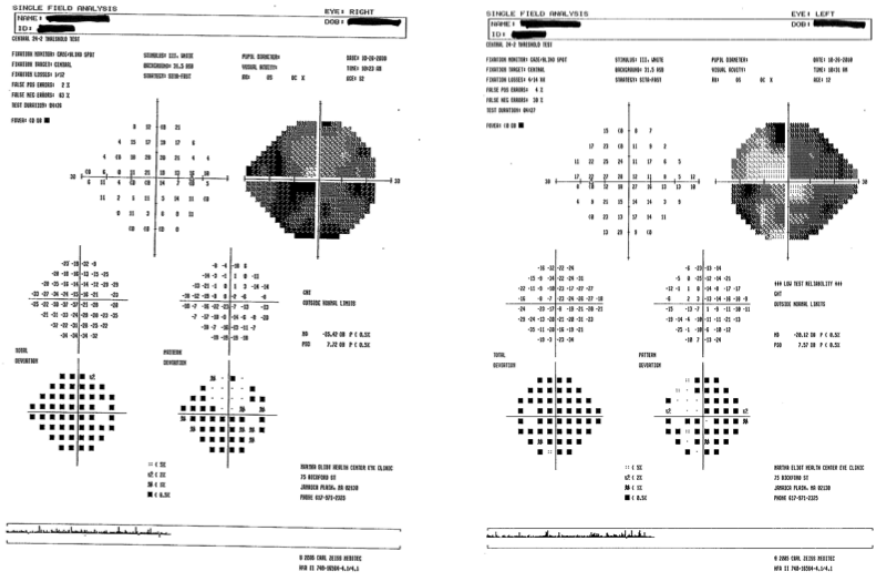


Figure 5
Visual Field Test Results, 10/26/10



Educator's Guide

Key concepts

1. The role of case history in considering FVL
2. The significance of the diagnosis for the well-being of the patient
3. The importance of the optometrist in coordination of care with caretakers and health care providers

Learning objectives

1. Recognize and understand common signs and presentations of FVL
2. Identify potential causes of FVL
3. Understand that a diagnosis of FVL requires ruling out ocular pathology
4. Understand the different types and potential reasons for FVL

5. Effectively be able to communicate with other health care professionals regarding the psychological status of the patient
6. Understand the long-term management and follow-up schedule for the patient

Discussion points

1. What are some conditions that would present as significant decreased vision in both eyes?
2. How do we decide if the vision is refractive vs. pathological vs. non-organic?
3. Describe the differential diagnosis of FVL vs. malingering and other conditions

Generating questions, hypothesis and diagnosis

1. At this time, what are our differential diagnoses?
2. Describe the classic signs of FVL
3. What kinds of questions were asked of the patient to ascertain that there might be a psychosocial cause for the FVL?
4. What diagnostic tests were used to diagnose FVL? What other options are there?
5. Is the diagnosis logical?

Management

1. Discuss whether it would be sufficient to refer the patient to an ophthalmologist
2. How does the optometrist coordinate care with other disciplines in this case?
3. What are the roles of the primary care physician and the psychiatrist in this case?
4. What categories of psychiatric medications can cause visual disturbances?
5. How can the optometrist help to address non-compliance from the patient in keeping appointments?
6. Discuss the different types of FVL

Critically assessing implications, patient management and psychosocial issues

1. What are the implications of only monitoring the patient's vision and not coordinating care with mental health practitioners or the primary care physician?
2. What are the potential consequences if the patient is non-compliant with follow-up care?
3. Discuss how the manner in which the patient was reading letters indicated a potential learning delay
4. Discuss how far an optometrist should go to ensure that a child with FVL is getting proper care at home, at school and in his or her health care facility
5. How might this case be different if it were an adult patient?

Literature review

The prevalence of FVL has been reported as 1.75% in children and 5.25% in adults.[1] FVL includes a variety of visual symptoms that often include ocular discomfort, pain, blurred or decreased vision, color vision loss, ptosis, blepharospasm and light sensitivity.[2] These symptoms, and often lack of symptoms, can present as a result of any number of physical, psychological or emotional stresses or abuse.[3] A diagnosis of FVL first must be differentiated from any type of pathology and then must further be differentiated from a malingering patient, which is often at the top of the clinician's list of differentials, especially in children. Clinically, a variety of testing can be useful in this diagnosis.

FVL becomes a possible diagnosis when a clinician's evaluation of a patient finds no pathology despite a patient's significant visual dysfunction. Griffiths and Eddyshaw suggested that because FVL implies that the cause of the problem has an underlying psychological cause, a less presumptive term might be "medically unexplained visual loss" for the first patient encounter, until more information is gained.[4] In their retrospective chart study of 58 patients with medically unexplained visual loss, there were 39 patients with bilateral visual loss, and 30 of them showed visual field defects of concentric contraction.[4] A classic sign associated with FVL is a tunnel vision or significant tubular constriction of a patient's visual fields. The type of visual field defect should be relatively consistent no matter what type of visual field testing is done, whether it is by confrontation fields, automated fields, tangent screen or Goldmann testing.[2] Other visual field defects associated with functional vision loss have been of a continuous spiral or jagged star pattern, and even a square or cloverleaf pattern in some cases.[5]

There can also be monocular functional vision loss, which can be assessed with tools such as red-green or polarized acuity charts, or by using vertical prism dissociation with a 4 diopter base down prism.[2] One condition that can have a similar presentation to FVL is cancer-associated retinopathy, which presents with positive visual phenomena, peripheral field loss (ring scotoma), decreased vision and color vision and a normal fundus exam that may involve retinal arteriolar narrowing.[2]

A review of the literature shows that children with functional vision loss are often linked with psychiatric issues or stressors from home and/or school. Taich et al. studied 71 children with non-organic vision loss and found that most were connected with psychological or psychiatric illness.[6] The study found that 31% had home or school stress, 26.7% had diagnosed mental health issues such as anxiety, depression and attention deficit disorder, and 22.5% wanted glasses. Girls in this study outnumbered the boys by 3:1 in wanting glasses. There was a higher association of sexual abuse with eye pain and monocular FVL.[6] In a study of 14,000 children, 40 children (1.75%) had psychogenic amblyopia, and 37% of the 40 children recovered their vision within 1 year.[7] Lim et al., in a 5-year retrospective chart study of 140 patients, reported that FVL appeared to be most prevalent in teenagers between 16 and 17 years old, and was three times more common in females.[1] Social problems at home or school were the issue in 45.8% of the FVL cases for the children in this study, and 3.6% had suffered sexual abuse.[1] More than 30% of the adult and pediatric cases reported underlying depression and/or anxiety.[1] Given the strong association of FVL with psychosocial issues, it is important to take a careful history in a sensitive and reassuring manner to assess the etiology of functional vision loss and the need for referral for counseling.

FVL can be broken down into a number of subsets, which should be considered a part of this diagnosis: conversion disorder, somatization, pseudosomatization, factitious disorder and hypochondriasis.[2] Our patient likely suffers specifically from ocular conversion disorder, a subset of conversion disorder. Conversion disorder can include a number of non-pathological neurological and ocular symptoms, often in the second and third decade. Specifically related to vision, findings often include decreased visual acuities, restricted visual fields and ocular pain, among others. The prevalence of conversion disorder has been reported in the range of 11 and 300 out of 100,000, and it is historically associated with poor medical knowledge, lack of concern for one's situation, and low socioeconomic status.[8] However, FVL should be included as the differential for any socioeconomic status due to the possibility of significant stressors in any life stage. The question may arise as to how a patient can perceive themselves as not seeing when anatomically their visual pathways are fine. Current research is pointing to a regulation dysfunction of the modulation pathways within the limbic system, anterior cingulate and orbitofrontal cortex, which may explain the mismatch between what is seen and the patient's perception of what they see.[9]

Somatization (somatoform disorder) is a result of emotional stress that manifests as physical symptoms. It is unintentional and manifests both objective and subjective symptoms.[4] Hypochondriasis essentially is a constant worrying or fear of having an illness, which presents in the form of the patient believing he/she actually has a condition.[2]

Additionally, there are two disorders that are essentially malingering and should be dealt with as such, with the provider's discretion. In pseudosomatization, the individual knowingly attempts to mislead the provider while claiming to suffer from any number of emotional/psychological issues.[2] Essentially, the individual is faking a somatoform disorder. Fictitious disorder (Munchausen's syndrome) is similar to pseudosomatization with the major difference being that the individual will actually harm him/herself or child with the intention of garnering attention from any number of people.[2] Many times, patients who may be experiencing FVL can be mistaken as malingerers. Because of this, it becomes necessary to be able to accurately differentiate malingering from FVL. A study of 973 children with non-organic vision loss revealed 30 cases of malingering or functional vision loss.[10] Six of the 30 cases (20%) were found to be related to psychosocial stressors, and 40% of the 30 cases were malingering because of a desire for glasses.[10] Interestingly, the month with the highest incidence of presentation of non-organic vision loss was September, at 26.7%. The months with the least incidence were July and August.[10] It is important to evaluate the patient's attitude and affect and to use as many objective findings as possible while speaking to the parent/guardian (if applicable).

Medications prescribed for psychiatric conditions often have visual implications. In general, medications for treatment of ADHD are stimulants, such as methylphenidate (Ritalin, Metadate, Concerta, Daytrana), amphetamine (Adderall), lidexamfetamine dimesylate (Vyvanse) and dextroamphetamine (Dexedrine, Dextrostat). The non-stimulant medication (Strattera) is also commonly used.[11] Methylphenidate has been associated with blurred vision and accommodative dysfunction.[12,13] Anticholinergics can also decrease tear production, leading to ocular surface disease.[5]

Some studies have been done to investigate ocular patterns of children with ADHD, as well as the effect of stimulants on the vision of children with ADHD. A 2007 study in Sweden found that 76% of the 46 ADHD children tested had abnormal ophthalmologic findings, such as subnormal VA, strabismus, reduced stereo vision, subnormal near-point of convergence, refractive errors, small optic discs and/or small optic rim areas, increased retinal arterial tortuosity and/or signs of cognitive visual problems.[14] The researchers also found that the addition of treatment with stimulants did not improve visual acuity in these patients. However, a smaller study of 18 children with ADHD in Sweden found that visual acuity and visual field performance improved significantly with methylphenidate and amphetamine.[15]

When FVL is associated with school or home stresssors, research suggests that the prognosis is good for recovery of visual deficit. Lim et al. reported that of their 140 patients, normalization of decreased VA or VF loss occurred in 58.3% of patients, and was more likely in children.[1] Only 10.9% of their patients needed to be referred for counseling; the remainder needed only reassurance that their vision would improve.[1] Taich et al. reported that 80.2% of his 71 pediatric patients improved to the 20/30 visual acuity line.[6]

Discussion

While the diagnosis of FVL is relatively straightforward, the coordination of care for this young patient was complex. The cause of FVL can be an even more difficult diagnosis to arrive at in a child such as the patient in this case. Our patient was a recent immigrant from the Dominican Republic. He was bilingual (Spanish and English), had multiple socioeconomic barriers, had an unstable but improving home life and had psychiatric diagnoses, including ADHD. The patient had all of these stressors as well as frequent school absences due to poorly managed asthma, a recent broken leg and the depth of the functional vision loss he endured for a period of 6-9 months. It was noted both through visual acuities and a series of 24-2 Humphrey visual field test that the child's improvement in vision closely mirrored his improving emotional status. After about 9 months of close optometric and psychiatric monitoring, the child's acuities were restored to 20/20 OD and OS, and visual field testing showed drastic improvements. His school performance improved corresponding to his visual recovery.

FVL in a child can be emotionally traumatic and can impact the child's school life for an extended period of time. A study of 45 children with FVL found 73.3% of them having issues not attending or having frequent absences from school.[16] Optometrists have the opportunity to identify children with visual problems that may interfere with their academic performance, while the family and school are unaware of these potential issues. These visual obstacles can be communicated to the patient's

school team to help to support the student's educational goals. Educators may wish to include results from the eye exam in the child's Individualized Educational Plan (IEP) if one is required. In this case, the patient had signs of dyslexia, which also happened to run in the family. The optometrist can play a major role in ensuring appropriate psychological counseling, emotional support for the family, requests for special needs at school, and consistent follow-up for frequent no-shows.

Our patient fortunately showed great improvement over the course of a year while receiving close attention from the co-managing primary care physician and psychologist. He did not present with any type of pathology and showed notable improvements with regard to Humphrey visual field testing, visual acuity, visual symptoms, and parent/psychologist/teacher-reported behavior. Side effects of blurred vision and accommodative dysfunction from the methylphenidate could still have been a factor. Accommodative testing could not be initiated early as a diagnostic tool due to the significance of the patient's visual loss. In the past, he had been noted to have an intermittent left microesotropia, but this would not have caused a bilateral pattern of vision loss. His cycloplegic refractive error had been minimal, and his visual acuities were 20/20 OD and OS. It is worth noting that a Hirschberg or Krimsky test could have been performed even with hand motion vision to determine if the microesotropia had changed in magnitude. If the acuity was truly decreased to hand motion, as opposed to the patient malingering, the magnitude of the microesotropia could possibly increase due to less sensory input for maintaining eye alignment. This would have been another tool for discerning whether vision loss was organic or functional. Given the child's history, we planned to have a consistent follow-up schedule with the child/parent until a full and obvious recovery was made before returning to an annual exam schedule. The optometry student should understand that effective communication and sensitivity to psychosocial issues such as a stressful home environment and difficulty keeping appointments are vital in managing this type of situation.

Had the patient's vision not improved significantly over the first couple of visits, a referral would have been initiated for optical coherence tomography (OCT), electroretinogram (ERG) and visual evoked potential (VEP) tests to search for subclinical findings indicative of retina, optic nerve and visual pathway disorders. An OCT scan could indicate nerve fiber layer, optic nerve or retinal pathology causing vision loss, identifying organic disease such as isolated foveal hypoplasia, which is extremely rare.[17] A military hospital study of 33 FVL patients found that the thinner the retinal nerve fiber layer on OCT, the more likely a patient was to have organic pathology.[18] The absence of pathology on OCT further helps to confirm the FVL diagnosis. A pattern VEP of normal and symmetric amplitude in a patient with severe vision loss would confirm a functional cause for the visual deficit and help rule out optic nerve and visual pathway disease.[5] A normal ERG result would support the lack of severe retinal organic disease.[5] Additionally, it is worthwhile to consider neuroimaging studies such as computed tomography (CT) or magnetic resonance imaging (MRI) to evaluate other potential pathological changes. Some organic conditions that masquerade as FVL include the following: Stargardt's macular dystrophy, Leber's congenital amaurosis, albinism and ocular albinism, isolated foveal hypoplasia, rod monochromatism, retinitis pigmentosa sine pigmento, retrobulbar optic neuritis, neoplasms involving the central nervous system, stroke, multiple sclerosis, Alzheimer's disease and drug toxicity.[5,19] In a retrospective chart study of 140 patients diagnosed with FVL, it was reported that 3 of these patients eventually were diagnosed with some organic cause for their visual loss.[1] Due to bilateral presentation, age, previous healthy exams, and no family history of retinal disease, many of these conditions were ruled out in the first set of visits for this particular case.

FVL is a diagnosis in which the role of the optometrist may be crucial in ruling out malingering, refractive error, functional vision problems and ocular pathology. Below is a list of questions applicable to a clinician who suspects FVL.

1. **Subjective Findings**
   a. CHILDREN
      i. Is the child browsing in the optical prior to examination?
      ii. Does the parent think the child has a visual problem, or suspect an ulterior motive? Does the parent notice the child squinting, covering an eye, sitting close to the television, etc.?
      iii. Is the child performing well in school? If the answer to this question is 'no', then it is possible the child is trying to produce a reason for his/her poor performance.
      iv. Did a sibling, friend or parent recently get a new pair of glasses? The child may be envious of the new pair of glasses and simply want a pair for him/herself.
      v. If the patient previously had no color vision problems, it may be worth retesting this with HRR#4 or Ishihara. A patient with FVL may not recognize any of the plates, while a malingering child will often choose random numbers or, often, one number higher or lower than what is actually being shown.
   b. ADULT
      i. Does the patient seem to have an ulterior motive or a known motive such as a pending lawsuit, disability claim, etc.? Often, this question can be directly asked of the patient.
      ii. Does the person seem legitimately concerned about the change in vision or does he or she really only want a form signed and not seem to care about restoration of vision?
      iii. Did the patient drive to the exam?

iv. Observe for signs of malingering such as careful application of makeup, whether the patient is carefully dressed, etc.

c. CHILDREN and ADULTS

i. If the patient is somewhat unassuming, consider asking a simple question such as "what time it is" if he or she is wearing a watch, or "what color are my eyes?"

ii. Does the problem exist at both distance and near? Clinically, FVL often exists at both distance and near, whereas a patient who is malingering will choose one or the other and focus his or her problems on this.

iii. "The Magic Glasses Test": One of the best and most effective ways to catch a malingerer is to simply put the patient behind a phoropter or use a trial frame with a very low power lens (-0.25, plano, +0.25, etc.) and see if acuities improve. A patient with FVL will not improve, while a malingerer most likely will. This is particularly effective with children who are just looking for a pair of glasses.

iv. Refracting from the 20/10 line: A patient who is malingering, if told that the 20/20 line is "double in size," may be persuaded to read more of the letters.

v. Can the patient sign his or her name with no difficulty? People who are completely blind still have proprioceptive cues and can sign their names or touch their fingers together. A malingerer will pretend to write their names with difficulty.[20]

2. Objective Findings

a. How does the patient act? Is he/she bumping into walls while walking into the exam room, or showing signs of uncertainty when looking around?

b. While a visual field test may be useful, it can also be time-consuming and fruitless because a patient may choose not to recognize any lights, hand motion, etc.

c. Additionally, one seemingly common method of distinguishing a malingerer from a patient experiencing FVL is to have the patient walk up to the chart and compare visual acuities. For example, if a patient can read 20/100 in your chair, and then walks halfway between the chair and the chart, he or she should appreciate the 20/50 line.

d. Pupils: A normal pupil response usually indicates that a person is not blind. An exception would be when there is complete and bilateral destruction of either the optic radiations and/or both occipital cortices.[7]

e. Potential acuity meter (PAM): If told that the test bypasses the eye and measures the brain directly, a malingerer will usually do his best on the test.[7]

In addition to the above methods, in order to confidently diagnose FVL, a student should understand the value of interdisciplinary management in this case, and how to be effective in dealing with so many key players, whether patient, parent, teacher or doctor.

To teach students how to function in a multi-disciplinary environment, the following exercises are suggested:

1. Group discussion: Discuss as a group what potentially sensitive issues might arise when a patient is questioned about potential causes of psychological distress such as home life, work, financial issues, abuse, etc.
2. Role playing: What are the roles of the primary care physician and the psychiatrist in this case? Have students divide up into groups representing the PCP, the psychiatrist, the teacher and the optometrist. What pertinent information would each professional need?
3. Role playing: Discuss how one might speak differently when describing the case to an ophthalmologist vs. a primary care doctor vs. a mental health practitioner (e.g., clinical terms, asking for advice vs. giving advice to another doctor, documentation of conversation)
4. Letter writing: FVL takes time to resolve. How should the optometrist involve the patient's teacher? Students can write a letter to the teacher to convey important information to help school performance.
5. Observation: If students are currently rotating through a multidisciplinary care site such as a community health center, it is beneficial for them to observe the optometrist while he or she is talking with another practitioner about a patient.

Conclusion

The primary care optometrist has the potential to play a pivotal role in the diagnosis and co-management of functional vision loss, especially in children. Had the patient in this case been referred to a specialist outside of the health center, coordination of care would have been more difficult. The optometrist was able to communicate effectively with the parent, the teacher, the primary care physician and the psychiatrist to get the best outcome of visual recovery. This case highlights the importance of interdisciplinary collaboration and communication, as well as an effective patient-doctor relationship.

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