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Case Report

Bilateral Optic Neuritis in a Child Following Epstein-Barr Virus Infection

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A B S T R A C T

A rare case of bilateral optic neuritis is presented in a child with no light perception. Ophthalmic examination revealed dilated pupils without reaction to the light, swollen optic discs with small peripapillary hemorrhages in both eyes. Serology revealed evidence of recent Epstein-Barr virus infection. After treatment with high dose of corticosteroid visual acuity gradually improved. After four months visual acuity was normal despite complete pallor of the optic disc. Ebstein-Barr virus infection should be considered in the differential diagnosis of bilateral optic neuritis in a child with severe bilateral visual loss.

Key words: *optic neuritis, child, Epstein-Barr virus*

Introduction

Optic neuritis (ON) is a common condition in adults and has been analyzed extensively via the Optic Neuritis Treatment Trial.[1] Optic neuritis is characterized by unilateral visual loss over several hours to several days.[1–3] Childhood optic neuritis is different from the one seen in adults. In children, optic neuritis often occurs in both eyes. Acute bilateral loss of vision is not common in pediatric population.[4–12]

In differential diagnosis of acute non-traumatic visual loss in a child diagnosis of optic neuritis must be considered. Optic neuritis has certain characteristics which help to distinguish it from the other etiologies of acute visual loss such are reduction in visual acuity, visual field loss, impairment of color vision (dyscromatopsia), afferent pupillary defect and optic disc abnormalities. We report a severe case of bilateral optic neuritis with no light perception in a 6-year-old girl who was admitted to pediatric emergency care.

Case report

A 6-year-old girl was admitted to Pediatric emergency department on March 10, 2000, because of sudden visual loss in both eyes one week following upper respiratory infection included a cough and rhinorrhea. Two days prior to arriving at pediatric clinic she complained of headaches and tiredness. On the morning at the day of admission she noticed that she could see only light in both eyes. The parents noticed that both pupils of a child were dilated. No visual abnormalities were noticed prior to our examination. There was no history of eye pain or toxin ingestion. On presentation at pediatric emergency department she had no light perception in both eyes. Her systemic examination was performed by pediatrician. Neurological examination was within normal limits, her general condition was good, she had no fever.

Ophthalmic examination revealed normal eye position and movements. Both pupils were dilated and were not reactive to the light. The anterior segment of both eyes were normal. Fundus examination revealed a swollen optic disc with marked venous congestion and some very small peripapillary hemorrhages bilaterally (Figure 1). Laboratory test results (erytrocite sedimentation rate, complete blood count, routine blood chemistry) were all within normal limit. Lumbar puncture chemistry and citology were normal. Toxicological examinations were also normal. Rheumatological profile (anti-DNA, rheumatoid factor, ANA, ANCA, C_3, C_4) was normal. Serologies for adenovirus, citomegalovirus, herpes simplex virus, measles, varicella-zoster virus, Rubela, leptospirosis, mycoplasma pneumoniae, toxoplasmosis were negative. The serology showed recent Epstein-Barr (EB) virus infection.

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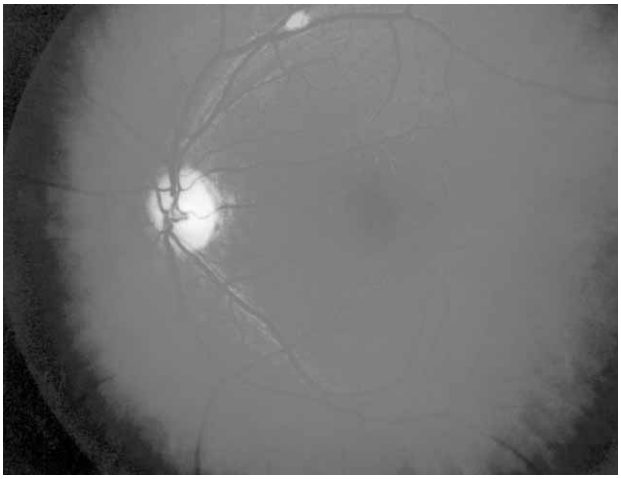

Fig. 1. Fundus photo of the left eye 3 days after the first presentation with no light perception. Optic disc is swollen with venous congestion and small peripapillary hemorrhages.

Urgent computerized tomography of brain, orbits and the optic chiasma was performed and revealed no lesions. Magnetic resonance imaging (MRI) four days later of the brain and orbits demonstrated only enlarged optic disc bilaterally. Echographically, edema of the optic disc was found in both eyes. The optic nerve-sheat complex behind the globe was normal without increased subarachnoid fluid.

Intravenous equivalent prednisolon dose of 2 mg/kg/day was given for 4 days followed by oral prednisone 1 mg/kg/day. The dosis was than tapered over 2 weeks. No clinical improvement in visual acuity was observed after 4 days treatment. The papilledema gradually decreased during these days. On the fifth day visual acuity improvement began. Visual acuity improved to light perception in both eyes. On the eight day of steroid treatment visual acuity improved to counting fingers at 3 meters, both optic discs showed sharped borders without elevation. Relative afferent pupillary defect was still present. In 2 weeks visual acuity improved to 0.1 in right and to 0.2 in left eye. Temporal pallor of the disc was observed in both eyes. Color vision was not present 3 weeks following steroid treatment. After 3 weeks color vision gradually improved. Two months after the first presentation she recognized all colors with some difficulties to distinguish red and green. Brainstem evoked response audiometry, visual evoked potential testing, elecroretinography were performed one month after the admission and were without abnormalities.

Four months after the first treatment visual acuity improved to 1.0 in both eyes. Complete pallor of the optic disc was present in both eyes. Visual field (Goldmann perimetry) showed severe concentric constriction to 15 degree in both eyes two weeks after beginning of therapy and improved in 8 months to 45° degree (Figure 2, Figure 3). The further improvement of visual field was not observed in the next months. On re-examination 42 months

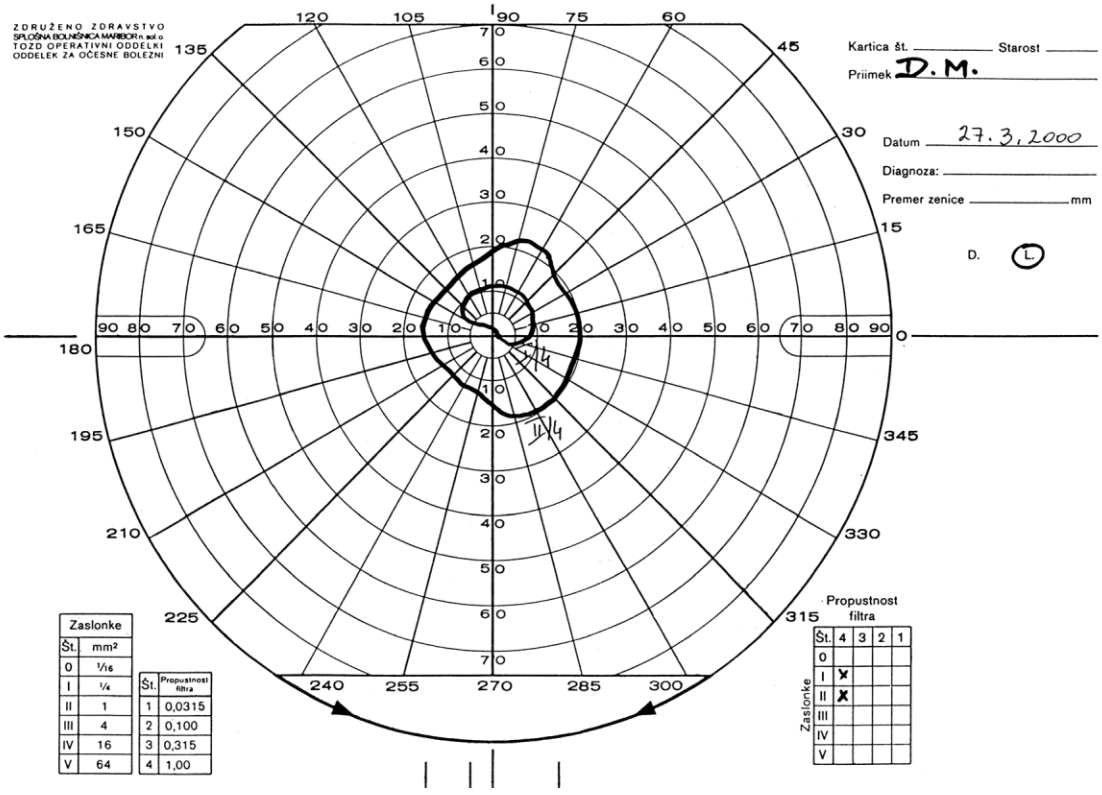

Fig. 2. Visual field (Goldmann perimetry) of the left eye 2 weeks after the first presentation.

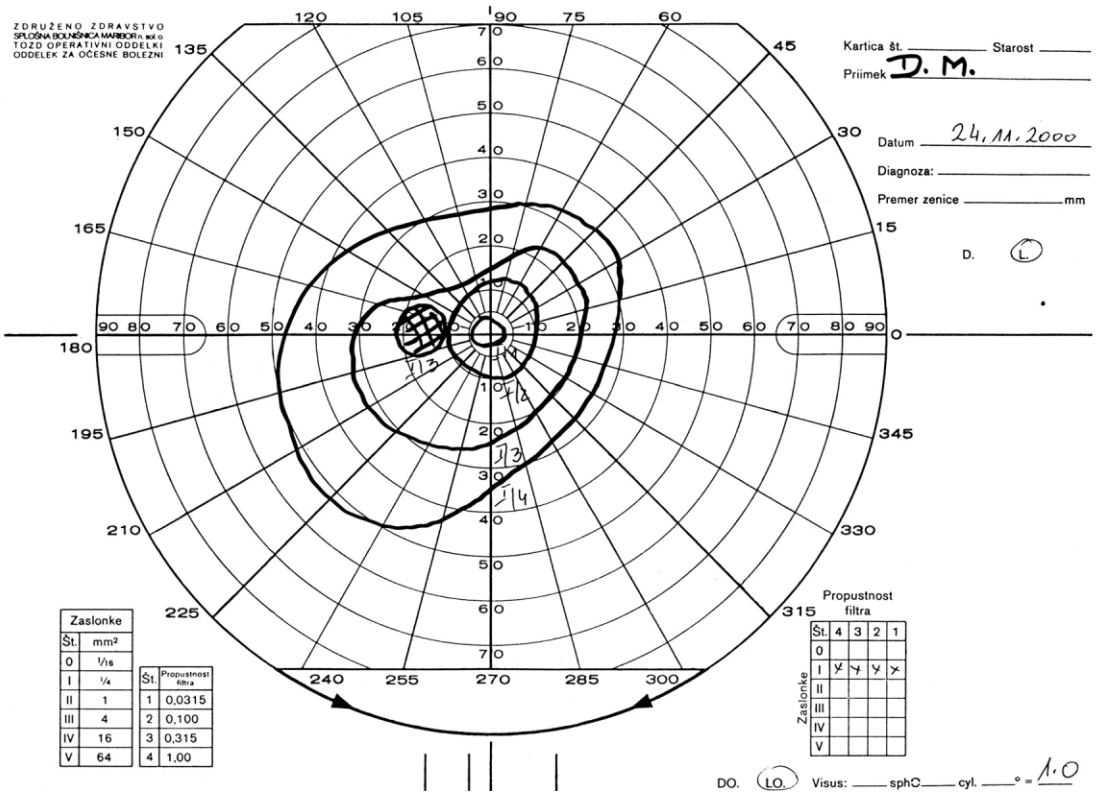

Fig. 3. Visual field (Goldmann perimetry) of the left eye after 8 months of follow-up.

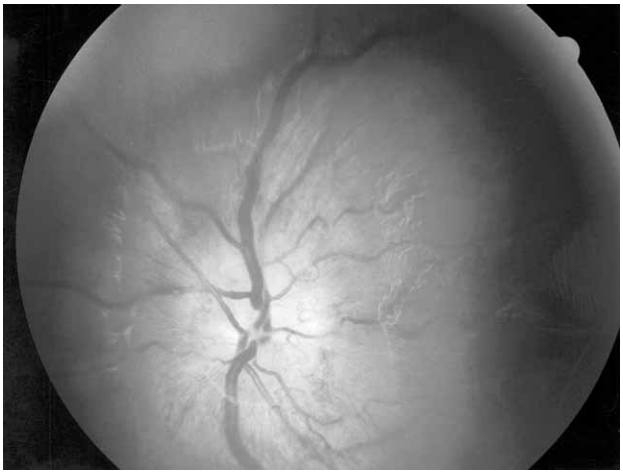

Fig. 4. Fundus photo of the left eye 42 months after the first presentation with normal visual acuity and complete pallor of optic disc.

following fist presentation visual acuity was 1.0 in both eyes with complete pallor of both optic discs, normal color vision and normal neuro-ophthalmic results (Figure 4).

Discussion

Several differential diagnosis of children with acute bilateral visual loss should be considered such are optic neuritis, trauma, intracranial masses, cerebral pseudotumor, toxic optic neuropathy, infiltrative optic neuropathy and other consideration.[7] Optic neuritis in children has no sex predilection as in adults where it affects predominantly female. In adults it occurs in 75% unilateral with disc swelling in 35%.[1,2] In children the majority had bilateral disease (66%) and swollen discs (64%).[3,12–14] The reduction of visual acuity varies from mild loss to complete blindness.[7]

The prognosis of visual recovery in children with optic neuritis is good. Farris and Pickard observed excellent visual recovery in children with bilateral optic neuritis after treatment with intravenous steroids.[6] Good et al. reported of poor visual recovery in children with optic neuritis treated with oral prednisolon.[15] Morales et al. treated 73% of cases (11 from 15) with intravenous methylprednisolon with visual outcome equal or less than 0.1 in 30%[12]. In this study authors revealed that unilateral presentation of pediatric optic neuritis was associated with good visual prognosis (100%≥0.5) but a high probability (75%) for developing multiple sclerosis. Patients with bilateral involvement had worse visual outcome (50%≥0.5, 35%≤0.1) with low probability to developing multiple sclerosis.[12] In this study of 15 children 10 had bilateral and 5 unilateral presentation of optic neuritis. Initial visual acuity ranging from 0,8 to no light perception. No light perception was present in two children but only in one eye. The visual acuity of the other eye was 0.3 and counting fingers. The final visual acuity in those eyes with initial no light perception was

hand motion in one case and light perception in the other case in mean follow-up time of 17.5 months. Despite initial visual acuity of no light perception in our child, excellent final visual acuity was achieved.

There are some long-term studies on children with optic neuritis regarding their ultimate visual prognosis as well as risk of developing multiple sclerosis in later years with follow-up time from 8 to 18 years. The number of patients who developed multiple sclerosis within follow-up time was different ranging from 6 to 43%.[3,14,18,19] There are still no prospective controlled pediatric studies about the use of corticosteroids in the treatment of pediatric optic neuritis. Morales et al. found no correlation between final visual acuity and use of corticosteroids. In our case high doses of cortocosteroids were used immediately after the first presentation. After 4 days of therapy improvement of visual acuity began on fifth day with light perception. The final visual acuity of 1.0 was achieved 4 months after first presentation. Visual field improved significantly but remained concentric constricted. Both discs seemed symmetrical, with sharp borders and persistent pallor (optic atrophy). The clinical picture was stable during 42 months follow-up.

In children, optic neuritis has been most frequently associated with viral infections and autoimmunization with live/attenuated viruses.[3,6] Optic neuritis can be caused directly by infection, or indirectly by autoimmune processes.[6–8] There are only few reports about optic neuritis in children associated with EB virus infection.[8,20] We present a further case of pediatric optic neuritis in association with EB virus infection with bilateral acute blindness and complete recovery of visual acuity in 4 months. Our patient had monophasis episode induced by recent EB virus infection. Further observation of the child is necessary to confirm our conclusion that this was not a first episode of multiphasis disorders such as multiple sclerosis. We recommend prompt treatment with high-dose intravenous corticosteroids to achieve good visual recovery. In our opinion, the present case is a further contribution to the post-EB virus infection in association with optic neuritis in childhood.

REFERENCES

1. OPTIC NEURITIS STUDY GROUP, Arch. Ophthalmol., 109 (1991) 1673. — 2. BECK, R. W., P. A. CLEARY, Arch. Ophthalmol., 111 (1993) 773. — 3. KENNEDY, C., F. D. CARROLL, Arch. Ophthalmol., 63 (1960) 747. — 4. GLASER, J. S., In: TASMAN, W., E. A. JAEGER (eds): Duane's Clinical Ophthalmology. (Lippincott-Raven, Philadelphia, 1997). — 5. SIATKOWSKI, R. M., J. S. GLASER, In : TASMAN, W., E. A. JAEGER (eds): Duane's Clinical Ophthalmology. (Lippincott-Raven, Philadelphia, 1997). — 6. FARRIS, B. K., D. J. PICKARD, Ophthalmology, 97 (1990) 339. — 7. WILLIAMS, J. R., Pediatr. Emerg. Care, 12 (1996) 210. — 8. BEIRAN, I., I. KRASNITZ, M. ZIMHONI-EIBSITZ, Y. A. GELFAND, B. MILLER, Acta Ophthalmol. Scand., 78 (2000) 226. — 9. SATO, K., E. ADACHI-USAMI, A. MIZOTA, J. Neuro-ophthalmol., 18 (1998) 21. — 10. OKAMOTO, K., J. ITO, R. OGAWA, T. FURUSAWA, K. SAKAI, S. TOKIGUCHI, M. TAKAGI, Eur. Radiol., 9 (1999) 731. — 11. LUCCHINETTI, C. F., L. KIERS, A. O'DUFFY, M. R. GOMEZ, S. CROSS, J. A. LEAVIT, P. O'BRIEN, M. RODRIGEZ, Neurology, 78 (1997) 1413. — 12. MORALES, D. S., R. M. SIATKOWSKI, C. W. HOWARD, R. WARMAN, J. Pediatric Ophthalmol. Strabismus, 37 (2000) 254. — 13. VISUDHIPAN, P., S. CHIEMCHANYA, S. SANTADUSIT, Ped. Neurol., 13 (1995) 293. — 14. RIIKONEN, R., M. DONNER, H. ERKILÄ, Dev. Med. Child Neurol., 30 (1998) 349. — 15. GOOD, W. V., R. MUCI-MENDOZA, B. O. BERG, Aust. N. Z. J. Ophthalmol., 20 (1992) 319. — 16. HEDGES, T. R. III., Surv. Ophthalmol., 36 (1992) 424. — 17. LESSER, R. L., E. W. KORNMEHL, A. R. PACHNER, Ophthalmology, 97 (1990) 699. — 18. PARKON, V. P., R. HIERONS, W. I. MCDONALD, Brain, 107 (1984) 951. — 19. KENNEDY, C., S. CARTER, Pediatrics, 28 (1961) 377. — 20. PURVIN, V. P., N. HRISOMALOS, D. DUNN, Neurology, 38 (1988) 501.

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OBOSTRANI NEURITIS VIDNOG ŽIVCA U DJETETA NAKON INFEKCIJE EPSTEIN-BARROVIM VIRUSOM

SAŽETAK

Rijedak slučaj obostranog neuritisa vidnog živca bez percpcije svjetlosti prikazan je u djeteta. Oftalmološki pregled pokazao je dilatirane pupile bez reakcije na svjetlost, otečene optičke diskove, s diskretnim peripapilarnim krvarenjima u oba oka. Seroloških pregledom dokazana je nedavna infekcija Epstein-Barrovim virusom. Nakon liječenja visokim dozama kortikosteroida, oštrina vida se postupno poboljšala. Nakon četiri mjeseca, oštrina vida je postala normalna, bez obzira na potpun palor optičnog diska. Infekciju Ebstein-Barrovim virusom treba razmatrati pri diferencijalnoj dijagnozi bilateralnog optičnog neuritisa djeteta s teškim bilateralnim gubitkom vida.