CASE REPORT

A single injection of intravitreal ranibizumab in the treatment of choroidal neovascularisation secondary to optic nerve head drusen in a child

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SUMMARY

Optic nerve head drusen are acellular, calcified deposits which may be found in buried or exposed drusen form. Choroidal neovascularisation secondary to optic nerve head drusen is rarely seen in childhood. This case report summarises the clinical and therapeutic outcomes of a 13-year-old girl with unilateral choroidal neovascularisation secondary to optic nerve head drusen. The patient was successfully treated with a single intravitreal ranibizumab injection. After a month from the injection the visual acuity increased dramatically and maintained at the same level during 9 months of follow-up time. There was no complication related to the injection.

BACKGROUND

Optic nerve head drusen (ONHD) are acellular, calcified deposits which may be found in two different forms; buried drusen and exposed drusen.¹ Buried drusen are more common in early childhood and may be difficult to detect because they lie beneath the surface of the disc. The appearance of buried drusen may mimic papilloedema. Choroidal neovascularisation (CNV) secondary to ONHD is a rare cause of visual loss in children.² Recent reports showed that CNV secondary to ONHD can be successfully treated with intravitreal anti-vascular endothelial growth factor (anti-VEGF) agents on an as-needed treatment regimen.

CASE PRESENTATION

A 13-year-old girl was admitted with the complaint of decreased visual acuity in her right eye (RE) since 6 weeks. The best-corrected visual acuity (BCVA) was 20/80 in the RE and 20/20 in the left eye (LE). Ocular and systemic history was unremarkable. Anterior segment examination and intraocular pressure measurements were normal in both eyes. Dilated fundus examination revealed elevated optic discs with blurred margins in both eyes (figure 1A, B). In addition, an elevated yellow lesion extending from the optic nerve head towards the macula was observed in the RE (figure 1A). Fundus autofluorescence imaging demonstrated bright nodular autofluorescence corresponding to ONHD on the surface of optic nerve head in both eyes (figure 1C, D). In the RE, a central area of relative hypoautofluorescence surrounded by marked hypoautofluorescence due to CNV and/or subretinal fluid/fibrinous exudate was located at the temporal side of the optic nerve head. The late

phase of fluorescein angiography scan showed a central area of hyperfluorescence corresponding to CNV surrounded by blocked fluorescence from subretinal fluid/fibrinous exudate in the RE (figure 1E, F). Spectral domain optical coherence tomography (SD-OCT) imaging showed irregular bulges over the area of optic nerve head in both eyes (figure 1G, H).

A cross-sectional SD-OCT scan of the macula showed juxtapapillary CNV with high reflectivity and subretinal fluid extending from the optic nerve head to the macula in the RE (figure 2A). Parents of the patient signed a consent form explaining the potential risks and benefits of intravitreal injections. A 0.5 mg/0.05 mL intravitreal ranibizumab injection was then given under general anaesthesia.

OUTCOME AND FOLLOW-UP

After a month from the injection, BCVA increased to 20/25. Serial scans of SD-OCT at months 1, 3 and 9 showed no subretinal fluid (figure 2B–D). BCVA maintained at the same level (20/25) and no complication related to the injection was observed.

DISCUSSION

The prevalence of ONHD and their association with CNV in children are very rare. There is no established treatment regimen yet. Over the years, many treatment modalities have been proposed such as laser photocoagulation, macular surgery and photodynamic therapy.^{3–5} With the introduction of anti-VEGF therapy in recent years, the prognosis of retinal diseases has changed dramatically. Anti-VEGF therapy is currently indicated for the treatment of CNV, macular oedema associated with vascular occlusion or diabetes mellitus and retinopathy of prematurity. We used a single intravitreal injection of ranibizumab for the treatment of juxtapapillary CNV secondary to ONHD in a 13-year-old girl. A successful result was obtained in the patient, and this indicates that a single injection of intravitreal ranibizumab may be useful for the treatment of CNV secondary to ONHD. No recurrence was observed during the follow-up period. Similar results have been reported in the literature.^{6–7} Gregory-Evans *et al*⁶ used three monthly intravitreal ranibizumab injections to treat CNV secondary to ONHD in an 11-year-old boy. They reported that BCVA improved to 20/20 from 20/100 and complete resolution of exudative maculopathy was achieved during 6 months of follow-up. Delas *et al* used two consecutive monthly injections of intravitreal

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Figure 1 Fundus photo of the right and left eye (A and B). Arrow indicates yellow elevation in the papillomacular area (A). Autofluorescence images of the right and left eye (C and D), fluorescein angiographies of the right and left eye (E and F), spectral domain optical coherence tomography of the right and left eye (G and H).

ranibizumab to treat CNV secondary to ONHD in a 12-year-old girl. They reported that subretinal fluid was disappeared and BCVA improved to 20/60 from hand movements. After 12 months' of follow-up BCVA was 20/60.⁷ Knape *et al*⁸ reported their successful treatment for CNV secondary to ONHD in a 5-year-old boy. They used a combination of focal laser photocoagulation and intravitreal bevacizumab.⁸ Baillif *et al*⁹ used a single intravitreal ranibizumab injection to treat CNV secondary to ONHD in a 5-year-old boy. They reported that visual acuity improved to 20/25 from 20/60 and remained stable over a 12-month follow-up period.⁹

This report adds to the evidence base accumulating for the use of ranibizumab in a case of CNV secondary to ONHD. CNV secondary to ONHD might be more sensitive than CNV secondary to age-related macular degeneration. Flexible

treatment regimens should be advised in paediatric patients rather than monthly injections in these settings. Larger series are needed to confirm our findings.

Learning points

- Optic nerve head drusen may lead to loss of visual acuity in children.
- Choroidal neovascularisation caused by optic nerve head drusen may be treated by intravitreal ranibizumab injection.
- Flexible treatment regimens should be advised in paediatric patients.

Figure 2 Spectral domain optical coherence tomography of the right eye before the treatment (A), at month 1 (B), at month 3 (C) and at month 9 (D).

Competing interests None.

Patient consent Obtained.

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