

## Case Report

# Resolution of Recalcitrant Uveitic Optic Disc Edema Following Administration of Methotrexate: Two Case Reports

Se Joon Woo<sup>1\*</sup>, Mi Jeung Kim<sup>2\*</sup>, Kyu Hyung Park<sup>1</sup>, Yun Jong Lee<sup>3</sup>, Jeong-Min Hwang<sup>1</sup>

<sup>1</sup>Department of Ophthalmology, Seoul National University Bundang Hospital, Seoul National University College of Medicine, Seongnam, Korea

<sup>2</sup>Department of Ophthalmology, Seoul National University Hospital, Seoul National University College of Medicine, Seoul, Korea

<sup>3</sup>Department of Internal Medicine, Seoul National University Bundang Hospital, Seoul National University College of Medicine, Seongnam, Korea

A 13-year-old male and a 15-year-old female presented with optic disc edema associated with chronic recurrent uveitis. While the ocular inflammation responded to high doses of oral prednisolone, the disc edema showed little improvement. After oral administration of methotrexate, the disc edema and ocular inflammation were resolved, and the dose of oral corticosteroid could be reduced.

**Key Words:** Child, Disc edema, Methotrexate, Ocular inflammation, Uveitis

Optic disc edema or papillitis is commonly associated with chronic anterior uveitis in children, and its prevalence has been reported to be 21% [1]. However, there have been few reports regarding the treatment for recalcitrant uveitic disc edema, especially in children [2]. Methotrexate, a member of the antimetabolite class, has been used as an immunosuppressive agent that is effective against ocular inflammatory disease [3]. Here, we report two cases of children with chronic recurrent uveitis and disc edema that did not respond to oral corticosteroid but that showed significant improvement following administration of methotrexate.

## Case Report

### Case 1

A 13-year-old male patient presented with bilateral optic disc edema accompanied by idiopathic chronic anterior uveitis that had been ongoing for two months.

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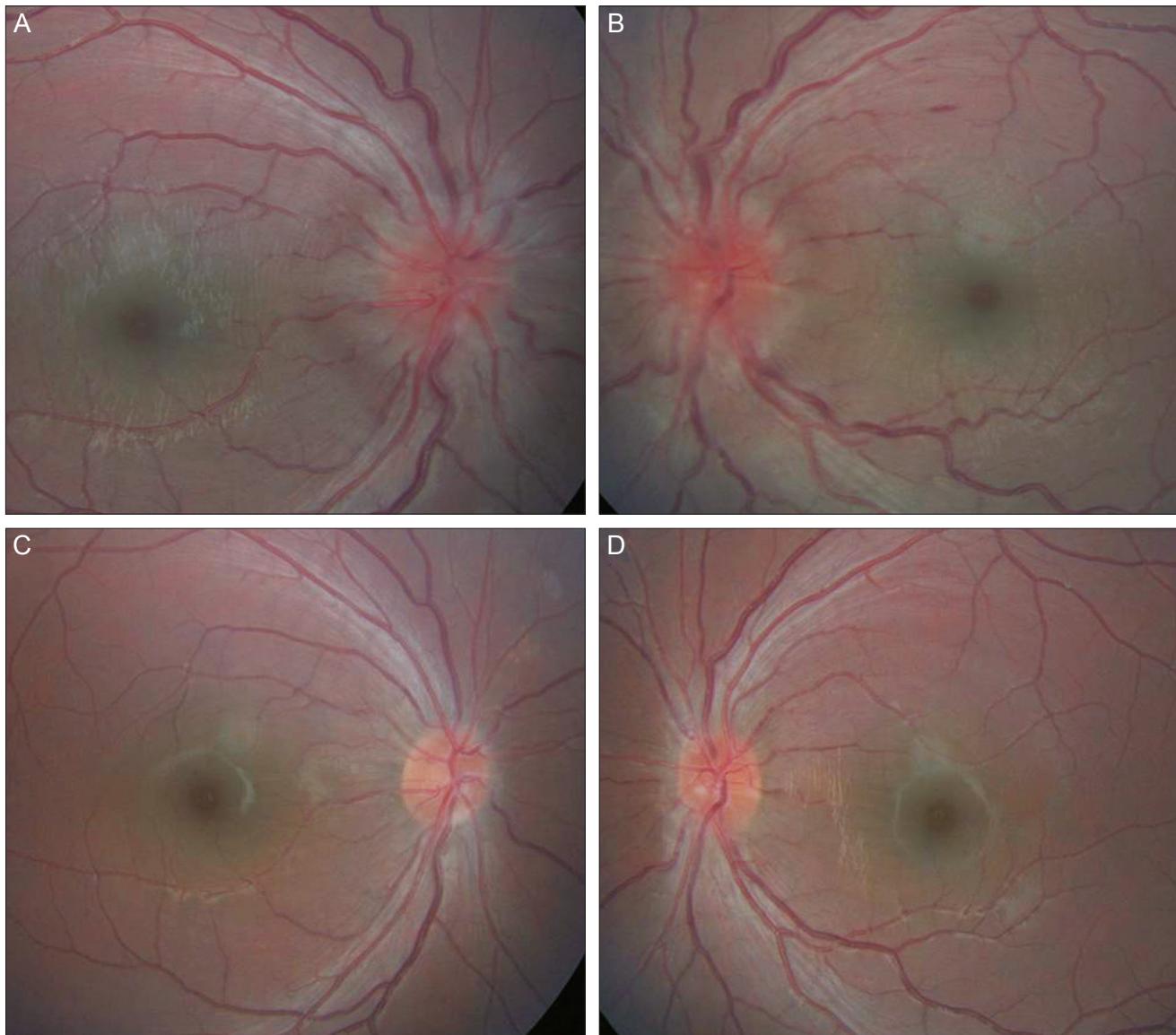
Corresponding Author: Se Joon Woo, MD. Department of Ophthalmology, Seoul National University Bundang Hospital, #300 Gumi-dong, Bundang-gu, Seongnam 463-707, Korea. Tel: 82-31-787-7377, Fax: 82-31-787-4057, E-mail: sejoon1@snu.ac.kr

\*The two authors made an equal contribution to this work.

At that time, his visual acuity was 20 / 25 in the right eye and 20 / 40 in the left eye, and there was no macula edema on funduscopic examination or optical coherence tomography. He had been taking 30 mg (0.52 mg/kg) of oral prednisolone daily. We could not find any neurologic or systemic abnormalities to explain the disc edema. For six months, he had taken oral prednisolone and could not taper it due to the recurrence of ocular inflammation. In addition, the disc edema had not subsided, even with a high dose of oral prednisolone (60 mg [1.05 mg/kg] per day). Thereafter, we added oral methotrexate 10 mg (0.18 mg/kg) per week to the daily dose of prednisolone 30 mg (0.52 mg/kg). After 3 weeks of methotrexate, the disc edema and ocular inflammation were alleviated, and his vision improved to 20 / 20 in both eyes (Fig. 1A and 1B). The disc edema and inflammation recurred during the oral prednisolone tapering period. However, a daily low-to-moderate dose of prednisolone (10-20 mg) combined with a weekly dose of methotrexate 15 mg (0.26 mg/kg) alleviated the ocular inflammation and disc edema (Fig. 1C and 1D). After 18 months of methotrexate and tapering the dose of oral prednisolone, the patient achieved stable vision without optic disc edema or ocular inflammation.

### Case 2

A 15-year-old female patient presented with optic disc



**Fig. 1.** Case 1. Fundus photographs of case 1. (A,B) At presentation, bilateral severe disc edema and vascular tortuosity were observed. (C,D) Three weeks after administration of methotrexate, disc edema and vascular tortuosity were resolved.

edema in the right eye and bilateral idiopathic panuveitis (Fig. 2A and 2B) with no associated neurologic or systemic abnormalities. Despite continued daily administration of oral prednisolone 30 mg (0.44 mg/kg) for 4 months, the disc edema persisted. We added a daily dose of cyclosporine 150 mg (2.21 mg/kg) to her medications. Although the anterior chamber inflammation had improved significantly, the disc edema persisted. We then prescribed a weekly dose of methotrexate, starting at 7.5 mg (0.11 mg/kg) and increasing to 15 mg (0.22 mg/kg), while reducing the prednisolone dose to 10 mg (0.15 mg/kg) per day and discontinuing the cyclosporine. The disc edema resolved dramatically one month after the initiation of methotrexate (Fig. 2C and 2D). The dose of oral prednisolone was tapered while increasing the dose of methotrexate to 20

mg weekly without recurrence of disc edema or ocular inflammation. After one year of methotrexate, the patient had good visual acuity in both eyes, and the intraocular inflammation was controlled without optic disc edema.

## Discussion

Optic disc edema from various causes may result in irreversible axonal damage and progressive visual field loss [4]. Although there have been reports of resolution of optic disc edema after successful treatment of anterior uveitis [2,5], there is no definite treatment guideline for uveitic disc edema in children who do not respond to corticosteroids. While corticosteroids are one of the traditional treatment regimens of uveitis, chronic oral intake by children can



**Fig. 2.** Case 2. A fundus photograph (A) and fluorescein angiography (B) of the right eye revealing disc edema and choroiditis. (C,D). One month after administration of methotrexate, the disc edema and fluorescein leakage from the optic disc were resolved.

lead to serious side effects, i.e., cataract, glaucoma, and growth retardation in prepubescent children. Recent studies have reported that methotrexate is moderately effective for controlling ocular inflammation and for achieving corticosteroid-sparing objectives as a monotherapy or in combination with other agents in both adults and children [3,6,7].

For long-term treatment with methotrexate, caution should be exercised regarding the systemic and ocular side effects. Elevated liver enzymes, nausea, fatigue, cytopenia, stomatitis, bone marrow suppression and liver cirrhosis have been reported as systemic side effects of methotrexate [8-12]. Ocular side effects include irritation and dry eye [13], as well as the rare occurrence of toxic optic neuropathy,

which can be reversed by the intake of folic acid [14-17]. Thus, regular ophthalmic and systemic examination is mandatory during methotrexate intake.

In our cases of steroid-refractory uveitic optic disc edema in children, methotrexate had a beneficial effect on the resolution of optic disc edema and controlled intraocular inflammation while sparing the corticosteroid. We are unaware of previous reports showing the efficacy of methotrexate reducing recalcitrant uveitic disc edema in children. Therefore, we think that this report is a significant reference regarding the effect of methotrexate in the treatment of pediatric uveitis accompanying disc edema.

## Conflict of Interest

No potential conflict of interest relevant to this article was reported.

## References

- Holland GN, Denove CS, Yu F. Chronic anterior uveitis in children: clinical characteristics and complications. *Am J Ophthalmol* 2009;147:667-78.e5.
- Kozak I, Robbins SL, Freeman WR. Bilateral papillitis associated with bilateral anterior uveitis in a child. *J Pediatr Ophthalmol Strabismus* 2007;44:374-6.
- Gangaputra S, Newcomb CW, Liesegang TL, et al. Methotrexate for ocular inflammatory diseases. *Ophthalmology* 2009;116:2188-98.e1.
- Rebolleda G, Munoz-Negrete FJ. Follow-up of mild papilledema in idiopathic intracranial hypertension with optical coherence tomography. *Invest Ophthalmol Vis Sci* 2009;50:5197-200.
- Monheit BE, Read RW. Optic disk edema associated with sudden-onset anterior uveitis. *Am J Ophthalmol* 2005;140:733-5.
- Foeldvari I, Wierk A. Methotrexate is an effective treatment for chronic uveitis associated with juvenile idiopathic arthritis. *J Rheumatol* 2005;32:362-5.
- Malik AR, Pavesio C. The use of low dose methotrexate in children with chronic anterior and intermediate uveitis. *Br J Ophthalmol* 2005;89:806-8.
- Walker AM, Funch D, Dreyer NA, et al. Determinants of serious liver disease among patients receiving low-dose methotrexate for rheumatoid arthritis. *Arthritis Rheum* 1993;36:329-35.
- Hoekstra M, van Ede AE, Haagsma CJ, et al. Factors associated with toxicity, final dose, and efficacy of methotrexate in patients with rheumatoid arthritis. *Ann Rheum Dis* 2003;62:423-6.
- Van Ede AE, Laan RF, Blom HJ, et al. Methotrexate in rheumatoid arthritis: an update with focus on mechanisms involved in toxicity. *Semin Arthritis Rheum* 1998;27:277-92.
- Salaffi F, Manganelli P, Carotti M, et al. Methotrexate-induced pneumonitis in patients with rheumatoid arthritis and psoriatic arthritis: report of five cases and review of the literature. *Clin Rheumatol* 1997;16:296-304.
- Ohosone Y, Okano Y, Kameda H, et al. Toxicity of low-dose methotrexate in rheumatoid arthritis: clinical characteristics in patients with MTX-induced pancytopenia and interstitial pneumonitis. *Ryumachi* 1997;37:16-23.
- Doroshow JH, Locker GY, Gaasterland DE, et al. Ocular irritation from high-dose methotrexate therapy: pharmacokinetics of drug in the tear film. *Cancer* 1981;48:2158-62.
- Johansson BA. Visual field defects during low-dose methotrexate therapy. *Doc Ophthalmol* 1992;79:91-4.
- Balachandran C, McCluskey PJ, Champion GD, Halmagyi GM. Methotrexate-induced optic neuropathy. *Clin Experiment Ophthalmol* 2002;30:440-1.
- Clare G, Colley S, Kennett R, Elston JS. Reversible optic neuropathy associated with low-dose methotrexate therapy. *J Neuroophthalmol* 2005;25:109-12.
- Sbeity ZH, Baydoun L, Schmidt S, Loeffler KU. Visual field changes in methotrexate therapy. Case report and review of the literature. *J Med Liban* 2006;54:164-7.