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Coincidence of Varicella-Zoster Virus Anterior Uveitis in a Patient with Chandler's Syndrome

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Key Words

Chandler's syndrome · Iridocorneal endothelial syndrome · Varicella-zoster virus · Anterior uveitis

Abstract

Purpose: We report a patient who, based on the clinical manifestations, was originally diagnosed as having Chandler's syndrome and later developed varicella-zoster virus (VZV) DNA-positive anterior uveitis. **Methods:** The patient with Chandler's syndrome who manifested anterior uveitis underwent a complete ophthalmologic examination. Polymerase chain reaction (PCR) was used to amplify the viral DNA in the aqueous humor to determine the cause of the intraocular inflammation. **Results:** Slit-lamp biomicroscopy showed focal iris atrophy and peripheral anterior synechiae (PAS); specular microscopy of the corneal endothelium disclosed the hammered-silver appearance. Based on these clinical findings, we diagnosed this patient as having Chandler's syndrome. During the follow-up period, however, the inflammatory cells suddenly appeared in the anterior chamber with formation of keratic precipitates and an increased intraocular pressure (IOP). VZV DNA was displayed in the aqueous humor by PCR. Based upon the diagnosis of VZV anterior uveitis, corticosteroids and acyclovir were given topically and systemically. The inflammation subsided with these medications; however, trabeculectomy was finally needed to control the IOP due to PAS progression. **Conclusion:** The coincidence of VZV anterior uveitis with Chandler's syndrome may constitute an implication for the possible viral etiology of iridocorneal endothelial syndrome.

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Introduction

Iridocorneal endothelial (ICE) syndrome covers a spectrum of abnormal conditions in the anterior segment characterized by proliferative corneal endotheliopathy, in which peripheral anterior synechiae (PAS), elevated intraocular pressure (IOP) and corneal endothelial decompensation are present. This disease preferentially occurs unilaterally in the eyes of middle-aged women without any episodes of intraocular inflammation [1]. The exact pathogenesis of ICE syndrome remains unclear, but the cell activity of corneal endothelial cells is thought to be disorganized to spread across Schwalbe's line towards the iris plane. The disease complex comprises three different clinical forms including essential iris atrophy, Chandler's syndrome and Cogan-Reese syndrome. Iris changes are less pronounced and corneal edema occurs more frequently in Chandler's syndrome than in the other two forms [2].

Varicella-zoster virus (VZV), on the other hand, causes unilateral, granulomatous anterior uveitis characterized by mutton-fat keratic precipitates, secondary glaucoma, iris atrophy and pupillary distortion due to PAS [3]. Although VZV anterior uveitis can be diagnosed easily when skin eruptions are present at the V1 region, it is difficult to diagnose the case related to zoster sine herpette unless VZV DNA is demonstrable in the aqueous humor sample [3]. We report here an interesting case that, based on the characteristic clinical manifestations, was originally diagnosed as Chandler's syndrome and later developed VZV DNA-positive anterior uveitis.

Case Report

A healthy, 40-year-old woman visited a private clinic with the complaint of hyperemia in her left eye and was referred to our hospital due to the presence of focal iris atrophy. At the initial examination, slit-lamp biomicroscopy of the left eye revealed localized iris atrophy with PAS at several sites, along with a hammered-silver appearance in the corneal endothelium. The corneal edema was absent and the IOP was 11 mm Hg (fig. 1a, b). The best corrected visual acuity was 20/20 in the affected eye. Anterior segment optical coherence tomography (OCT) documented the presence of PAS, with the corneal thickness being almost the same in both eyes (fig. 1c). Specular microscopy of the corneal endothelium in the left eye showed abnormal cells with a disrupted and irregular cellular border (fig. 1d). The corneal endothelium of the right eye was normal. Based upon these clinical findings, we diagnosed this patient as having Chandler's syndrome, and we decided to follow up without any treatment. However, PAS progressed rapidly at a somewhat unusual speed and, 3 months later, the IOP in the left eye was elevated to 32 mm Hg, while the anterior chamber was silent. Latanoprost (Xalatan®; Pfizer Japan, Tokyo, Japan) and dorzolamide hydrochloride-timolol maleate ophthalmic solution (COSOPT®; Santen Pharmaceutical Co. Ltd., Osaka, Japan) were topically applied to control the IOP <20 mm Hg. Six months later, the patient started to complain of visual disturbance in the left eye. Slit-lamp biomicroscopy revealed the inflammatory cells in the anterior chamber to have white keratic precipitates (fig. 2a). There was no vitreous opacity or retinal exudate. Polymerase chain reaction (PCR) was performed on an aqueous humor sample in search of a panel of human herpes viruses (HHVs) including herpes simplex virus (HSV) type 1 or type 2, VZV, Epstein-Barr virus (EBV), cytomegalovirus and HHV-6, HHV-7 and HHV-8 [4, 5]. It was found to be positive only for VZV. At this stage, we strongly suspected that this patient had unilateral anterior uveitis due to zoster sine herpette, and so we started the treatment with 3% acyclovir eye ointment

(Zovirax®; Santen Pharmaceutical Co., Ltd.) 5 times a day and 0.1% betamethasone eye drops (Rinderon®; Shionogi Pharmaceutical Co. Ltd., Osaka, Japan) 4 times a day, with oral administration of 20 mg/day of prednisolone and 1,500 mg/day of valacyclovir (Valtrex®; GlaxoSmithKline, Brentford, UK). The anterior chamber reaction subsided with this medication and was controlled with topical acyclovir and corticosteroids within 2 months. The iris atrophy and PAS further progressed with reduced corneal endothelial cell density (fig. 2b, c). As the IOP was elevated in spite of full medication with antiglaucoma agents, trabeculectomy was performed to control the IOP <15 mm Hg without medication.

Discussion

Based upon focal iris atrophy with PAS formation at several sites and corneal endothelial changes consistent with the hammered-silver appearance, we diagnosed this patient as having Chandler's syndrome. However, during the follow-up period, the PAS progressed rapidly and the patient developed anterior uveitis with an elevated IOP. The identification of VZV DNA in the aqueous humor and the favorable response to an antiherpetic agent and corticosteroids strongly indicated that this anterior uveitis was caused by VZV in the form of so-called zoster sine herpete.

Two possibilities exist to explain the pathogenesis of this case. The first is that VZV infection occurred coincidentally with Chandler's syndrome in this patient. Although the coincidence seems to be rare, this assumption is reasonable when considering the fact that both diseases develop preferentially in women. In fact, according to Kido et al. [3], the patients in their study with anterior uveitis due to zoster sine herpete were all female.

The alternative possibility is that VZV infection was originally present in a subclinical form to mimic Chandler's syndrome and finally became manifested as anterior uveitis. Indeed, both Chandler's syndrome and anterior uveitis caused by VZV notably share several clinical manifestations such as gender difference, unilateral involvement, the presence of focal iris atrophy, PAS formation and an elevated IOP.

Earlier, Bahn et al. [6] reviewed corneal endothelial dystrophy from an embryological point of view and classified ICE syndrome as a disease manifested with abnormal corneal endothelial proliferation. Unlike other corneal endothelial dystrophies, the invariable unilateral involvement with ICE syndrome implies that this disease may result from an acquired cause. In support of this hypothesis, Alvarado et al. [7] previously reported that HSV-DNA was detected in a substantial number of corneal specimens obtained from patients with ICE syndrome. Furthermore, Tsai et al. [8] found that IgG antibodies to EBV were significantly higher in patients with ICE syndrome than in healthy controls.

Further clinical investigations are definitely needed to determine the relationship between ICE syndrome and the viral etiology. However, ophthalmologists should be aware of the possible existence of viral infection when encountering a patient with presumed ICE syndrome.

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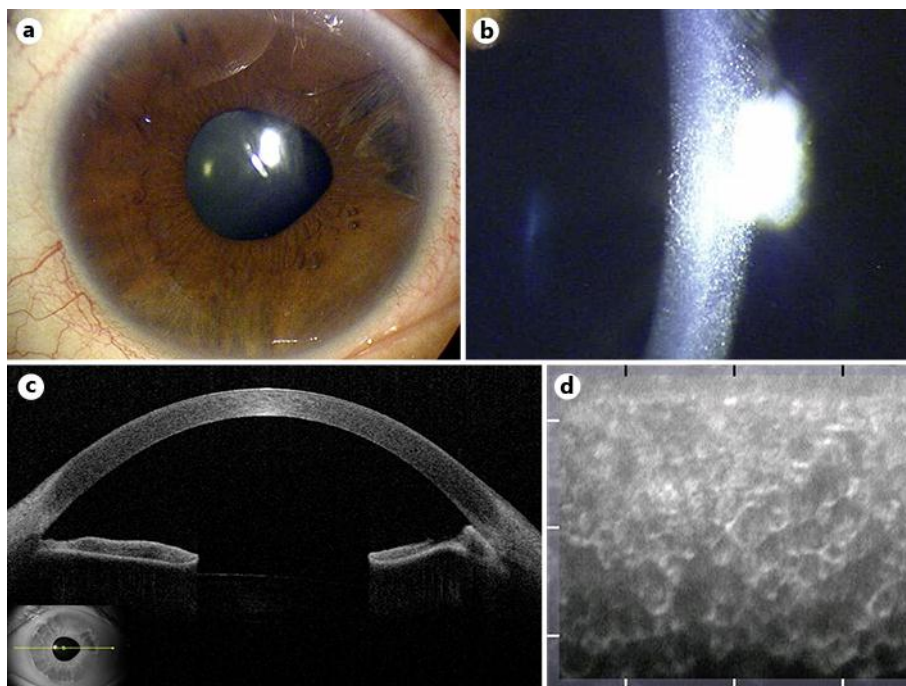


Fig. 1. **a** The photograph shows partial iris atrophy. **b** A specular view shows a hammered-silver appearance. **c** A horizontal, anterior-segment OCT image shows PAS corresponding to iris atrophy. **d** Specular photomicroscopy of the left eye shows a disrupted and irregular cellular border.

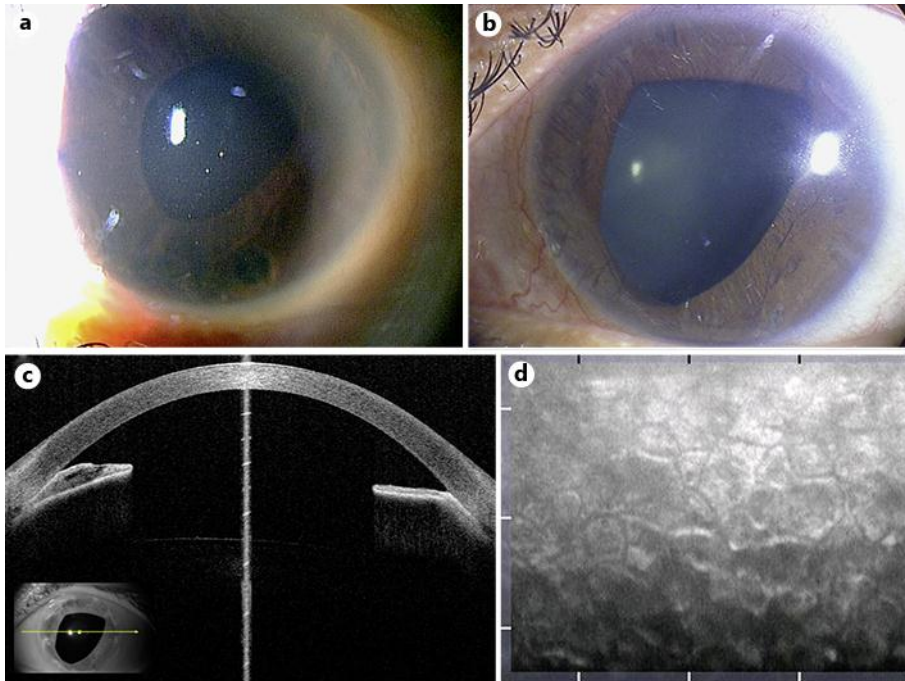


Fig. 2. **a** The photograph shows white keratic precipitates. **b** The photograph obtained 2 months after the appearance of anterior uveitis shows progression of the iris atrophy. **c** A horizontal, anterior-segment OCT image obtained 2 months after the appearance of anterior uveitis shows progression of PAS. **d** A specular photomicroscopy image obtained 2 months after the appearance of anterior uveitis shows an irregular cellular border and larger endothelial cells.