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# Visual complaints from rheumatoid arthritis patient

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**Abstract**
Hydroxychloroquine (HCQ) is widely used in treating rheumatological diseases all along, and recently popular under the controversy in COVID-19 treatment. There is no doubt HCQ is more widely used clinically nowadays worldwide. Rheumatoid arthritis itself is associated with some ocular pathologies, whereas its treatment with HCQ and oral steroid also posed some harms to the eyes. The pattern of HCQ retinopathy from toxicity was found to be racially different particularly on Asian patients. Wwe present a case of HCQ retinopathy, who was on prolonged (16 years) treatment, with a borderline dosage of ~6mg/kg/day.

**Keywords:** vision disorders; rheumatoid arthritis; hydroxychloroquine; retina; macular degeneration

## Introduction

## Case Description

A 52-year-old lady with seropositive rheumatoid arthritis (RA) diagnosed in 2003 was treated with daily hydroxychloroquine (HCQ) 400mg, prednisolone 5mg and cyclosporin A 25mg. Her body weights fluctuated from 58kg to 74kg in the past 16 years of treatment, and RA was well controlled with same dosage of combination maintenance therapy. In 2010, systemic control was stable, but there was one episode of right eye redness with pain, later diagnosed by ophthalmologist as peripheral ulcerative keratitis (PUK) associated with autoimmune disease. It was settled by weeks of topical eye drops including steroids without any adjustment of systemic treatment nor surgical interventions. Eventually, the PUK healed with circumferential peripheral corneal scar, leaving behind the characteristics “contact lens” cornea.

In 2013, patient complained of gradual painless blurring of vision, and bilateral posterior subcapsular cataract (PSC) associated with prolonged steroid and HCQ usage was diagnosed.

Phacoemulsification cataract surgeries were uneventful bilaterally.

In 2019, patient complained of bilateral blurring of vision again, with mild central scotoma. Fundus examination found increased pigmentation over the central macula. (175 words)

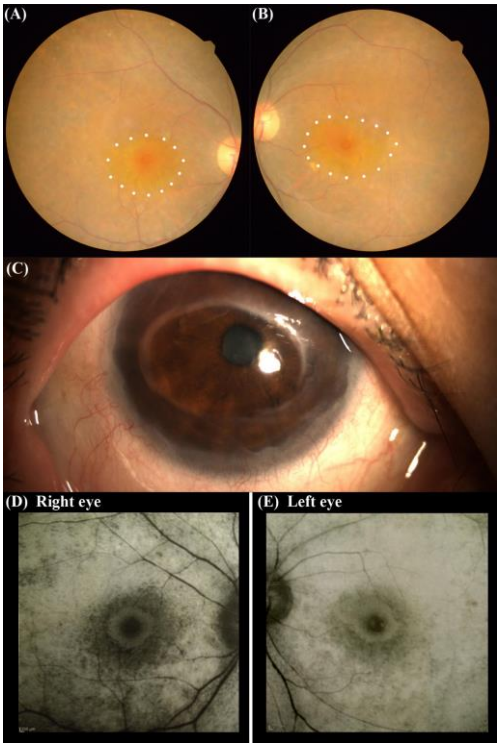


**Fig 1**

**Figure caption**

Colored fundus photos of (A) right and (B) left eyes of the rheumatoid arthritis patients on prolonged hydroxychloroquine maintenance therapy. Bilateral Bull's eye maculopathy were outlined by white dots. Colored slit lamp photos of right eye (C) demonstrating the "contact lens" cornea. Note the peripheral corneal thinning, haziness and conjunctivalization from scarring, leaving behind the central oval part of cornea optically clear, simulating a contact lens in situ. Fundus autofluorescence imaging of (D) right and (E) left eyes outlining the Bull's eye maculopathy from the ophthalmologist's perspectives.

**Supplementary materials**

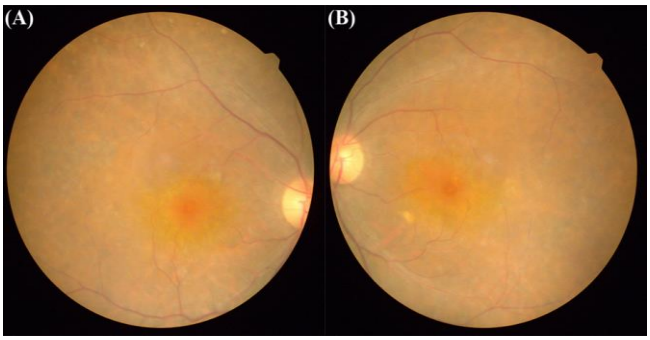


**Fig 2:** Colored fundus photos of (A) right and (B) left eyes without any markings.

**Discussion**

The macula pigmentations were more intense over the center, simulating the "Bull's eye" target. After 16-year of HCQ at ~6.1mg/kg/day, this RA lady suffered from HCQ retinopathy with the clinical sign of Bull's eye maculopathy. Ophthalmologist confirmed the diagnosis with fundus autofluorescence imaging, showing concentric rims of retinal pigment epithelium atrophy over the central macula [1]. Patient was instructed to stop HCQ immediately, and trial of azathioprine failed due to leukopenia down to $1.3x10^9$/L. Despite HCQ cessation, patient's retinopathy progressed for coming months, given HCQ's relatively long half-life of 22—50days (variable with dosage, liver and renal function).

HCQ is effective for a range of rheumatology diseases such as RA, juvenile idiopathic arthritis, systemic lupus erythematosus (SLE) and Sjogren's syndrome [1]. Its acute cardiac effect of QT-interval prolongation was well known under the COVID-19 pandemic [2], while ocular toxicity is evidenced with prolonged usage. Corneal and lens deposition could cause vortex keratopathy and PSC respectively, whereas retinal deposition could cause the classic parafoveal (Bull's eye) retinopathy; or pericentral maculopathy, which is more prevalent on Asian patients [1].

Other than the secondary ocular complications by treatment, auto-immune diseases like RA, SLE are associated with ocular diseases e.g. PUK, scleritis, vasculitis etc. relating to immune complex deposition over the ocular surface [3]. Corneal or scleral melt resulting in "contact lens" cornea and scleromalacia perforans may sometimes be observed in long standing cases [3].

(225 words)

**Declarations of Interest**

None

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