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Visual Case Discussion

Glaukomflecken: The classic and uncommon ocular sign after acute primary angle closure attack

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ABSTRACT

The widespread of upper respiratory tract symptoms caused by COVID-19 infections has increased the prescription and usage of antitussive and nasal decongestants. We presented a case of ocular acute primary angle closure attack with increased intraocular pressure after COVID-19 therapy. Glaukomflecken, the classic and uncommon ocular sign after acute primary angle closure attack, was demonstrated in this visual case discussion.

1. Visual case discussion

A 68-year-old female suffered from right eye pain and blurring of vision for 3 days, thus attended the Emergency department for consultations in the middle of the night. She has no past ophthalmic history and without any previous ocular surgery or laser done before. Examinations found Snellen visual acuity of 6/60 and 6/9 for right and left eye respectively. Intraocular pressures (IOP) were 53 and 18 mmHg for right and left eye respectively. Slit lamp examination found right eye injection with mid dilated pupil, cornea was edematous. (Fig. 1) Anterior chamber was shallow, and scattered dots of glaukomflecken were seen on the anterior lens capsule. (Figs. 2, 3) Nuclear sclerosis and cortical type of cataract was evidenced behind the anterior lens capsule. (Figs. 2, 3) Left eye examinations found shallow anterior chamber by the van Herick grading. (Figs. 4, 5)

Diagnoses were right eye acute primary angle closure (APAC), and left eye primary angle closure suspect (PACS). Immediate treatment to right eye was given, including topical 0.005% latanoprost, 0.5% timolol maleate, 1% brinzolamide, 0.15% brimonidine tartrate, 2% pilocarpine, 1% prednisolone acetate eye drops. Intravenous acetazolamide 500 mg was also given. Ophthalmologists were then consulted for urgent argon laser peripheral iridoplasty for right eye APAC, and prophylactic laser

peripheral iridotomy for left eye PACS.¹

APAC refers to eye with narrow anterior chamber angle that is acutely closed, resulting in a marked increase in IOP. This spectrum of diseases includes PACS, defined as eye with narrow angle that is not closed, and with normal IOP.¹ PACS patients are at risk of turning into APAC upon pupil dilation, most of the time arising from new medications use. Our patient had past medical history of hypertension, hyperlipidaemia, atrial fibrillation, and posterior circulation cerebral infarct few years ago with good recovery. She was on edoxaban, atorvastatin, diltiazem, and perindopril all along. She volunteered that she was well with these medications for the past few years without any complications. Upon enquiry of recently added new medications, she volunteered she had recently contracted COVID-19 infections, and was prescribed with some new medications. They included a 5-day course of molnupiravir, promethazine compound linctus, chlorpheniramine, and paracetamol. Her ocular symptoms happened the night when she started the set of COVID-19 therapy, of around 5 h after taking the medications. Reviewing her COVID-19 medications, promethazine compound linctus and chlorpheniramine were potential agents causing impairment of pupillary constriction via impairment of muscarinic acetylcholine receptors. In contrast, molnupiravir and paracetamol were irrelevant to the precipitation of this APAC attack. Patient was instructed to stop the 2

Abbreviations: APAC, acute primary angle closure; ACD, anterior chamber depth; COVID-19, coronavirus disease 2019; IOP, intraocular pressure; PACS, primary angle closure suspect.

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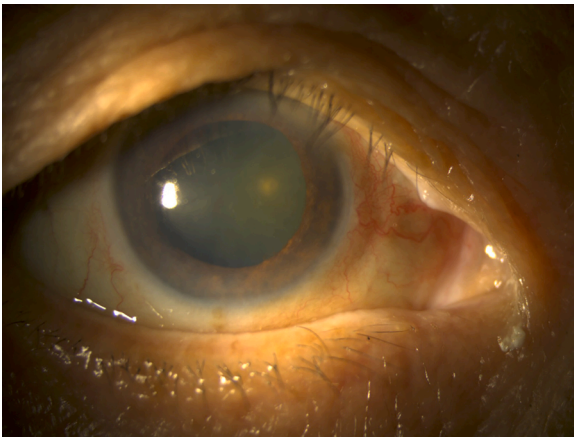


Fig. 1. Slit lamp photo of right eye shortly after initial treatment with topical eye drops. It showed injection (less than initial presentation), with mid dilated pupil, cornea was still edematous.

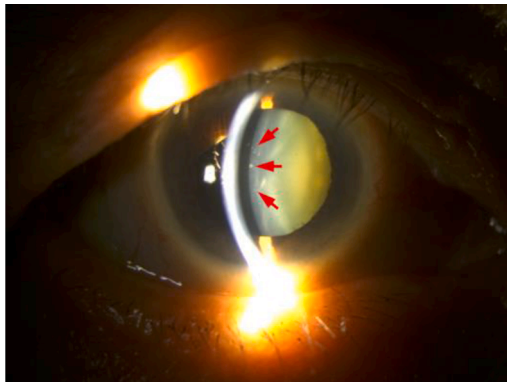


Fig. 2. Right eye scattered dots of glaukomflecken were seen at the center of the lens in the layer of anterior lens capsule, pointed out by the red arrows.

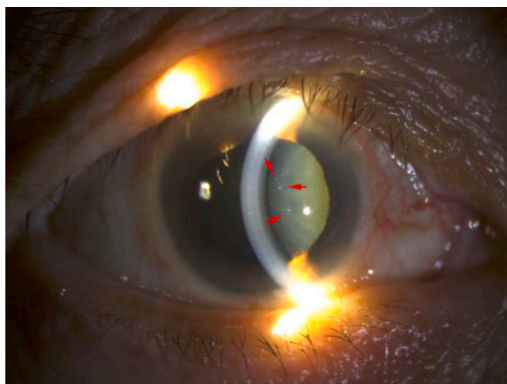


Fig. 3. Right eye scattered dots of glaukomflecken were seen at the more nasal side of the lens in the layer of anterior lens capsule, pointed out by the red arrows.

offending agents immediately.

Glaukomflecken refers to small anterior subcapsular grey-white fleck-like opacities secondary to lens epithelial cells necrosis. (Figs. 2, 3)² These changes are classically seen after an APAC attack with high IOP. Van Herick grading involves the usage of slit lamp to project a narrow beam of light at $\sim 60^\circ$ towards the nasal or temporal limbus, (Figs. 4, 5) and compare the width of the corneal thickness to the anterior chamber depth (ACD). If the ACD is of $\frac{1}{4}$ or less of the corneal

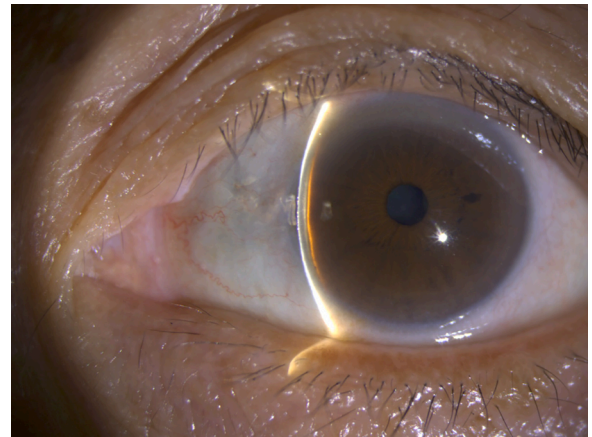


Fig. 4. Left eye shallow anterior chamber was evidenced by the van Herick grading in light environment.

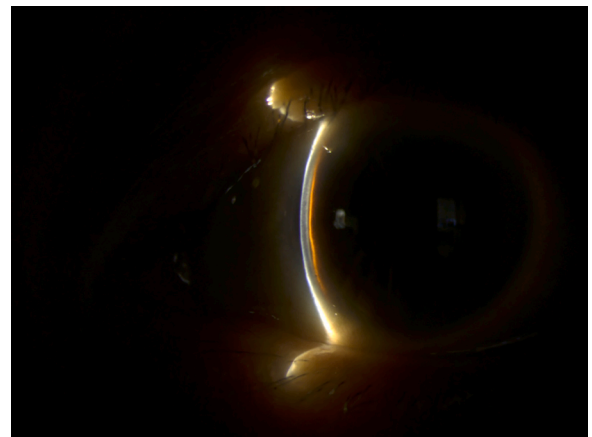


Fig. 5. Left eye shallow anterior chamber was also evidenced by the van Herick grading in dark room examination.

thickness, the anterior chamber angle may close and is defined as narrow.³

2. Questions and answers with a brief rationale true & false and / or multiple-choice questions

Q1. In an eye with APAC, which of the followings is correct description?

- a) High IOP and closed anterior chamber angle
- b) High IOP and opened anterior chamber angle
- c) Low IOP and closed anterior chamber angle
- d) Normal IOP and closed anterior chamber angle
- e) Normal IOP and opened anterior chamber angle

Answer: (a) High IOP and closed anterior chamber angle

APAC refers to high IOP and closed anterior chamber angle. Other descriptions are either different ocular pathologies, or impossible combinations.

Q2. Which of the following medications could cause APAC?

- a) Acetazolamide
- b) Edoxaban

- c) Molnupiravir
- d) Paracetamol
- e) Promethazine compound linctus

Answer: (e) promethazine compound linctus

Medications that are at risk of APAC include actified syrup (active ingredients: pseudoephedrine and triprolidine), diphenhydramine compound linctus, chlorpheniramine, promethazine compound linctus, and different types of anti-histamine.⁴ In contrast, paracetamol, molnupiravir, ammonia and ipecacuanha mixture are safe in PACS patients.⁵ Acetazolamide is one of the treatments for APAC by lowering IOP.

Declaration of Competing Interest

None.

Supplementary materials

Supplementary material associated with this article can be found, in

the online version, at [doi:10.1016/j.visj.2023.101702](https://doi.org/10.1016/j.visj.2023.101702).

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