Case report

Episodes of monocular blurring of vision during breastfeeding

Petros Petrou*, Kelly Giannopoulou, Evangelia Papakonstantinou, Aristotelis Karamaounas, Stylianos Kandarakis, Ilias Georgalas

First Ophthalmology Department, “G.Gennimatas” Hospital, National and Kapodistrian University of Athens, Greece

ARTICLE INFO

Keywords: Pupillary Membrane Lentis Breastfeeding Pregnancy

ABSTRACT

Purpose: To describe the occurrence of visual loss secondary to dispersion of cells deriving from an iris strand during pupil dilation in a 35-year-old woman.

Observations: A 35-year-old woman presented complaining of blurring in the Left Eye 15–30 minutes following breastfeeding at night hours. On clinical examination, the uncorrected visual acuity was 20/20 in both eyes and slit-lamp examination demonstrated cells in the anterior chamber (26–50 cells in field/3+ SUN working group grading) whereas the examination of the right eye was unremarkable. Dilated examination revealed a thin pigmented strand of iris in the Left Eye spanning from one edge of the iris to the other (1st to 8th h). This strand was connected at a single point to the anterior capsule of the lens and from the point of connection red blood cells flowed in a linear configuration that ended at the lower part of the anterior chamber.

Conclusions and importance: In this case report a patient with persistent pupillary membrane in the form of an individual iris strand connected to the anterior lens capsule presented with episodes of monocular vision loss. This occurred due to red blood cell dispersion from the iris strand during mesopic light conditions and pupil dilation while breastfeeding. To the best of our knowledge, this is the first report in the literature.

1. Introduction

The nutritional and oxygen requirement of the crystalline lens during gestation is provided by two main capillary networks that anastomose at its equator.1,2 The tunica vasculosa lentis forms the first network at the posterior lens surface and the anterior pupillary membrane forms the second network at the anterior lens surface deriving from the ciliary veins.1,2 These blood vessels undergo remodeling and regression and finally disappear shortly before birth. Dysfunction of this programmed cell death process may lead to remnants of the tunica vasculosa lentis that appear as a small opacity or strand at the posterior lens surface. Remnants of the pupillary membrane are often visible as pupillary strands.2

The persistent pupillary membranes (PPMs) represent a common congenital ocular anomaly occurring in 95% of normal newborn babies.3 Extensive PPMs, occluding the visual axis and resulting in reduced visual acuity, are relatively uncommon3 and they usually appear as persistent membranes or fine iris strands along the pupil.3 Sometimes they can get attached either to the anterior lens capsule forming a cataract or to the corneal endothelium.

The purpose of the present case report is to describe the occurrence of visual loss secondary to dispersion of blood cells deriving from an iris strand during pupil dilation in a 35-year-old woman.

2. Case report

A 35-year-old woman presented to the First Ophthalmology Department of the University of Athens, Greece complaining of visual loss over the last 2 months. She described a blurring in the Left Eye (LE) 15–30 minutes following breastfeeding at night hours. She did not use a smart phone during the night and the blurring of vision persisted when the lights were turned on. She is a mother of a 2-month old baby. She does not describe any similar event in the past and her past medical, ocular and family history are unremarkable. This is the second time she presented to the emergency Department for the same reason.

On clinical examination, the uncorrected visual acuity was 20/20 in both eyes. The intraocular pressure was 15 mmHg bilaterally and she had normal direct and consensual pupillary response in both sides. Ocular motility and color vision were normal. Slit-lamp examination demonstrated cells in the anterior chamber (26–50 cells in field/3+ SUN grading) whereas the examination of the right eye was unremarkable. Dilated examination revealed a thin pigmented strand of iris in the Left Eye spanning from one edge of the iris to the other (1st to 8th h). This strand was connected at a single point to the anterior capsule of the lens and from the point of connection red blood cells flowed in a linear configuration that ended at the lower part of the anterior chamber.
working group grading) whereas the examination of the right eye was
unremarkable. In both eyes the lens was clear with no opacities. No
angle pigmentation was noticed on gonioscopy in either eye.

Dilated examination revealed a thin pigmented strand of iris in the
LE spanning from one edge of the iris to the other (1st to 8th h). This
strand was connected at a single point to the anterior capsule of the lens
and from the point of connection cells flowed in a linear configuration
that ended at the lower part of the anterior chamber. No similar finding
was noted in the RE and fundus examination was within normal limits in
BE. Blood pressure measurement was 120/70 mmHg. Humphrey visual
field test was also unremarkable.

At re-examination, three months later, the patient was asymptomatic
(she stated that the episodes gradually decreased in frequency and
eventually stopped) and the iris strand could still be detected after
dilation of the left eye, it’s connection with the anterior lens capsule
remained but no cells were detected in the anterior chamber.

3. Discussion

Persistent pupillary membrane (PPM) represents a congenital ab-
normality that is either asymptomatic or if extensive may result in
reduced visual acuity due to occlusion of the visual axis or due to
cataract formation. Nonetheless, the reports of visual loss due to non-
extensive PPM are very limited. Cases of a spontaneous unilateral
hyphäma in a 75-year-old woman and a 45-year-old man have been
described due to bleeding from iris vessels related to a remnant of the
pupillary membrane. Histological examination of these strands show
that the fibrils often contain thin vessels empty of blood. Sometimes the
membrane may be attached to the lens and less frequently to the cornea.
In addition, recently, kadomoto et al. reported that PPM has vascular
flow by using anterior segment OCTA.

In our case, a strand of PPM was observed arising from the anterior
surface of the iris and stretching horizontally across the pupil with an
attachment on the anterior lens capsule in the LE. A continuous flow of
cells was visible on top of the fibril releasing an amount of them into the
anterior chamber and causing blurring of vision (Fig. 1, video). Also, it is
possible that red blood cells (RBCs) from rupture of PPM due to iris
movement caused vision loss. It is interesting that while this strand is
genital, the patient had not experienced any similar episodes in the
past. Also, it is worth mentioning that she was in postpartum period.
Moreover, the episodes took place only during night hours when the
patient woke up to breastfeed her infant.

Mydriasis commonly alters the disposition of pupillary strands since
they are usually distensible and stretch with the pupil. Altay et al.
studied the pupillary diameter in pregnant women in the third trimester,
in women in the postpartum period and at age-matched non pregnant
women. Results showed a significant increase in photopic and mesopic
pupil sizes in the third trimester of pregnancy and the second post-
partum month in comparison to the control group. It is believed that this
could be due to the fact that the iris dilator muscle is activated by
sympathetic system. In addition, pregnancy may result in a number of
ocular and systemic changes that could explain the described episodes in
our patient. It is known that oxytocin levels are increased during the
breastfeeding period. Oxycocin is also linked to increased pupil dila-
tion. We postulate that the iris movement was more frequent during
breastfeeding and it is possible that this was the trigger factor for more
red blood cells being released into the anterior chamber.

To the best of our knowledge, this is the first report of blood cells
released in the anterior chamber from a strand of PPM during breast
feeding causing blurring of vision.

Public or private support

None to disclose.

Fig. 1. Slit lamp photo of the left eye demonstrating the persistent pupillary
membrane strand (white arrow) stretching across the iris horizontally with an
attachment to the anterior lens capsule (blue arrow). This resulted in a flow of
pigment cells in the anterior chamber (yellow arrow) under specific pup-
diameter condition. (For interpretation of the references to color in this figure
legend, the reader is referred to the Web version of this article.)

Literature search

PubMed was searched on April 17, 2020, without date restriction, for
English-language articles, using the following terms: persistent pupillary
membrane, iris strand, vision loss during breast feeding, pigment in the
anterior chamber during breast feeding, vision loss during pregnancy.

Funding

No funding was received for this work.

Intellectual property

We confirm that we have given due consideration to the protection of
intellectual property associated with this work and that there are no
impediments to publication, including the timing of publication, with
respect to intellectual property. In so doing we confirm that we have
followed the regulations of our institutions concerning intellectual property.

Research ethics

We further confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

Written consent to publish potentially identifying information, such as details or the case and photographs, was obtained from the patient(s) or their legal guardian(s).

Authorship

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
2. Drafting the work or revising it critically for important intellectual content; AND
3. Final approval of the version to be published; AND
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

All those designated as authors should meet all four criteria for authorship, and all who meet the four criteria should be identified as authors. For more information on authorship, please see http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html#two.

All listed authors meet the ICMJE criteria. We attest that all authors contributed significantly to the creation of this manuscript, each having fulfilled criteria as established by the ICMJE.

Declaration of competing interest

No financial or proprietary interest by any of the authors.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ajo.2020.100976.

References

1. Müllner-Eidenböck, Amon M, Moser E, Klebermass N. Persistent fetal vasculature and minimal fetal vascular remnants: a frequent cause of unilateral congenital cataracts. Ophthalmology. 2004;111(5):906–913, May.
2. Lutty G, McLeod D. Development of the hyaloid, choroidal and retinal vasculatures in the fetal human eye. Prog Retin Eye Res. 2018;62:58–76.
3. Burton B, Adams G. Persistent pupillary membranes. Br J Ophthalmol. 1998;82(6), 709b-709b.
4. Banigallapati S, Potti S, Mathiha H. A rare case of persistent pupillary membrane: case-based approach and management. Indian J Ophthalmol. 2018;66(10):1480.
5. Gavriliu M, Horge I, Avram E, Belciuciu R, Olteanu IA, Kedves H. Persistent pupillary membrane or accessory iris membrane? Rom J Ophthalmol. 2015;59(3):184-187.
6. Brunini P, Belbrane G. Spontaneous Hyphema from persistent remnant of the pupillary membrane. Acta Ophthalmol. 2009;61(6):1099-1103.
7. McLean D. An unusual case of intraocular haemorrhage. Br J Ophthalmol. 1946;30(12), 758-758.
8. Kadomoto S, Uji A, Tsurikawa A. Anterior segment optical coherence tomography angiography in a patient with persistent pupillary membrane. JAMA Ophthalmol. 2018;136, e182932.
9. Sturrock G, Tripathi R. Pigmented lens striae. Br J Ophthalmol. 1976;60(4):287–293.
10. Altay Y, Altay M, Demirok G, Balta O, Bolu H. Measurements of pupillary diameter and wavefront aberrations in pregnant women. Sci Tech Rep. 2016;2016:1–5.
11. Moberg K, Handlin I, Kendall-Tackett K, Peterson M. Oxytocin Is a Principal Hormone that Exerts Part of its Effects by Active Fragments.
12. Leknes S, Wensberg J, Ellingsen D, Cheilakova O, Olausson H, Laeng B. Oxytocin enhances pupil dilation and sensitivity to ‘hidden’ emotional expressions. Soc Cognit Affect Neurosci. 2013;8(7):741–749. Oct.