CASE REPORT

Vascularisation of the anterior lens capsule in an eye with excellent visual acuity

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Accepted 12 June 2017

SUMMARY

A 53-year-old phakic female with a history of nanophthalmos and hyperopia was incidentally found to have unilateral neovascularisation on the left inferoanterior lens surface on routine review for ocular hypertension.

BACKGROUND

There is a paucity of literature describing neovascularisation of the lens capsule. To our knowledge, only one case report has previously been published, with neovascularisation being noted in a no perception of light eye. This is the first report of such pathology in an eye with good visual acuity, and we feel it is important to disseminate it to the medical community.

CASE PRESENTATION

The patient had been attending clinic regularly for over a decade but her lens had always been clear prior to this visit. She was completely asymptomatic with a best corrected visual acuity (BCVA) of 6/6 on the Snellen chart. Her regular topical medications were brinzolamide, timolol and brimonidine with stable intraocular pressure (IOP) for the last few years.

Her ophthalmic history included bilateral yttrium-aluminum-garnet (YAG) laser peripheral iridotomies (PI) and subsequent argon laser peripheral iridoplasty (ALPI) for treatment of narrow angles. Evidence of these previous interventions

was visible on clinical examination ([figure 1](#)). The patient had also undergone bilateral sclerectomies for uveal effusion 8 years previous to her latest follow-up with the left eye having a repeat sclerectomy 3 years later. No specific episodes of ocular inflammation had been previously documented. Fine blood vessels were found on the anterior lens capsule, crossing the visual axis. ([figure 2](#)).

INVESTIGATIONS

No iris or angle rubeosis was visible on gonioscopic examination and the anterior chamber was deep centrally. Dilated funduscopy was unremarkable with no evidence of neovascularisation at the disc or elsewhere. Widefield fundus fluorescein angiography showed no posterior segment ischaemia or neovascularisation. Routine blood tests were within normal range except for a slightly raised total cholesterol level. Doppler ultrasonography revealed less than 30% stenosis of the internal and external carotid arteries.

Anterior segment fluorescein angiography revealed inferior frond-like neovascularisation of the anterior capsule with small amounts of fluorescein leakage at 35 s ([figure 3](#)). Ultrasound biomicroscopy (UBM) of the iridocorneal angle showed an open angle inferonasally coinciding with the area of heaviest ALPI burns. The remaining 270 degrees were closed due to peripheral anterior synechiae. UBM also excluded a retroiridial membrane.

OUTCOME AND FOLLOW-UP

The patient continues to be monitored at four monthly intervals with well-controlled IOP and excellent BCVA.

DISCUSSION

There is a paucity of literature describing neovascularisation of the lens capsule (NVC), and to our knowledge only one case report has previously been published.¹ The latter highlighted a case of unilateral circumferential NVC on a background of post-traumatic secondary glaucoma, subsequent 360-degree cyclocryotherapy, loss of light perception and a symptomatic painful eye. Although the latter case was similar in terms of the absence of iris rubeosis or retroiridial membrane (RIM) and the presence of peripheral anterior synechiae (PAS), gonioscopy showed obscuration of the anterior chamber with a mature cataract, iris sphincter tears and a funnel-shaped retinal detachment. The configuration of NVC was also completely different

Figure 1 Colour photograph of the anterior segment of the right eye showing anterior capsular neovascularisation. Argon laser peripheral iridoplasty scars can be seen nasally. Superiorly, a neodymium:yttrium-aluminum-garnet laser peripheral iridotomy can be seen.

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To cite: Walkden A, Tan SZ, Au L, et al. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2017-220163

Figure 2 Colour photograph of magnified view of the iris showing fine blood vessels on the anterior capsule.

with 360 degree involvement and fine, very peripheral spoke-like vessels.

The lens is surrounded by capillaries in fetal life. Once these regress, it is isolated from direct contact with a blood supply. The hypoxic environment around the lens appears to regulate the rate of lens growth and may be important for its angiogenic privilege.² Anterior segment neovascularisation tends to occur in eyes with chronic ischaemia resulting from various aetiologies such as arteriovenous occlusion, ocular ischaemic syndrome, chronic retinal detachment and proliferative vitreoretinopathy. In all of these cases, ocular ischaemia drives the production of angiogenic factors such as vascular endothelial growth factor (VEGF) which diffuses from the vitreous to the AC along a concentration gradient.^{3 4} Some authors have shown that the lens produces inhibitory factors to prevent lens neovascularisation, even if iris neovascularisation is present. If the lens capsule is breached, however, the release of specific lens proteins can allow and even promote angiogenesis.⁵

Figure 3 Anterior segment fluorescein angiogram of the right eye showing neovascularisation of the anterior capsule with fluorescein leakage.

In our case, there was no evidence of posterior segment ischaemia to explain a VEGF drive. The localised but significantly large area of NVC is also different from that found in chronic anterior uveitis which usually presents with large calibre vessels spanning the pupillary border. There was also no documentation of previous inflammation. However, both clinical and UBM examination confirmed iris atrophy in the inferonasal segment and evidence of localised posterior synechiae (PS).

The presence of an isolated 'open window' in an otherwise crowded nanophthalmic anterior segment along with the presence of localised PS and iris-lens touch may have provided a channelled scaffold for vascular proliferation. We hypothesise that this patient's previous ALPI treatment may be responsible for the NVC, either by causing significant segmental inflammation or by producing an ischaemic iris segment with subsequent neovascular proliferation in the quadrant concerned. The possibility of iris ischaemia should always be considered when performing ALPI, and in this case the high intensity and close proximity of burns in the area affected would seem to back up this possibility. An alternative hypothesis would be that the lens capsule may have been breached during ALPI or YAG PI, but this would have most likely also caused visible inflammation and subsequent cataract formation which our patient clearly does not have.

Learning points

- ▶ Anterior capsular vascularisation is a rare finding and has not been reported previously in a patient with good visual acuity.
- ▶ As in this case, this can be found in isolation, without iris rubeosis or posterior segment ischaemic signs.
- ▶ Laser treatment applied to the iris may be the driving factor for new vessel formation on the anterior capsule.

Contributors All the authors examined the patient clinically. AW and ST drafted the manuscript. LA and KM edited and revised the final version. All authors agreed and authorised the final document for submission.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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