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MACULAR PSEUDO-HOLE IN SHAKEN BABY SYNDROME: UNDERSCORING THE UTILITY OF OPTICAL COHERENCE TOMOGRAPHY UNDER ANESTHESIA

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Abstract

Purpose: To describe a case of vitrectomy for nonclearing vitreous hemorrhage in shaken baby syndrome and the utility of intraoperative hand-held optical coherence tomography to distinguish a macular hole from a pseudo-hole.

Methods: Case report of a 4-month-old girl.

Results: After clearing of media opacity by vitrectomy, an apparent macular hole was seen with the operating microscope. However, this was shown to be only a pseudo-hole by intraoperative hand-held optical coherence tomography, requiring no further treatment.

Conclusion: Intraoperative hand-held optical coherence tomography may be important when performing vitrectomy for nonclearing vitreous hemorrhage in shaken baby syndrome.

Keywords

macular hole; optical coherence tomography; portable; pseudo-macular hole; shaken baby

A four-month-old girl presented 1 month after shaken baby syndrome (SBS)–associated trauma with a history of nonclearing vitreous hemorrhage in the right eye since the time of injury. On examination, she winced to light in both eyes and her intraocular pressure was normal to palpation. Her external and ophthalmoscopic examination was normal in both eyes except for premacular subhyaloid hemorrhage in the right eye. The patient’s hemorrhage was observed for an additional two weeks and was found not to change and the legal guardian agreed to proceed with pars plana vitrectomy (PPV) (Figure 1, image taken under anesthesia at the time of intervention).

The child underwent 25-gauge PPV in the right eye. Before PPV, a portable cart spectral domain optical coherence tomography (OCT) system with a hand-held camera (Envisu; BiopTigen, Morrisville, NC) was used to confirm the subhyaloid location of the hemorrhage (Figure 2). The PPV then proceeded normally. After the vitreous hemorrhage was removed,

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the intraoperative appearance of the retina suggested the presence of a full-thickness macular hole (Figure 3) along with a classic perimacular retinal ridge. However, repeat portable OCT performed intraoperatively¹ revealed the presence of a macular pseudo-hole requiring no additional treatment (Figure 4). The patient did well after PPV without recurrence of the hemorrhage or development of strabismus or cataract.

Among other ophthalmic injuries, full-thickness macular hole²⁻⁵ and retinoschisis⁶ have been documented in SBS. To our knowledge, ours is the first report of a macular pseudo-hole documented by OCT in this population. Our case reveals the difficulties in distinguishing pseudo-holes from full-thickness macular holes in SBS based on ophthalmoscopic appearance alone. Case reports of SBS have suggested that the ophthalmoscopic characteristics of our patient (namely a focal pigment ring at the fovea) might indeed correspond to a full-thickness macular hole when confirmed via OCT imaging.⁴ Our case indicates that such a finding does not rule out a macular pseudo-hole. Scott et al⁴ found a fibrotic scar within a macular hole (on OCT) in an infant with an atypical pigmentary foveal lesion after premacular hemorrhage in SBS. Scott et al and our cases suggest that OCT examination is essential in SBS with a suspected macular hole. With adequate media clarity, portable OCT imaging may be obtained during examination under anesthesia. Lateral rather than supine positioning may improve imaging by avoiding pooling of vitreous hemorrhage over the macula. When opaque media requires surgery (i.e., for nonclearing vitreous hemorrhage), intraoperative OCT (portable or microscope-mounted) may be needed to characterize macular anatomy once media opacities have been cleared.

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Fig. 1.

Color fundus image of the left eye taken under anesthesia before vitrectomy. The image shows premacular hemorrhage obscuring the fovea and nasal macula. There appears to be a hyperpigmented ring at the fovea posterior to the hemorrhage, suggestive of a macular hole (arrow). In addition, the vertically oriented gray line at the temporal border of the hemorrhage is typical of the perimacular retinal ridge.

Fig. 2. Horizontally oriented scan of the left central macula with a portable cart spectral domain OCT system with a hand-held camera before vitrectomy. The image shows a relatively normal retina nasally, preretinal hemorrhage temporally with associated signal blockage and a thickened and partially detached posterior hyaloid face.

Fig. 3.

Color fundus image taken by the operating microscope camera during PPV of the left eye, after removal of preretinal hemorrhage. The image shows the perimacular retinal ridge temporal to the fovea seen preoperatively, retinal pigmentation inferiorly corresponding to the edge of the previous subhyaloid hemorrhage, and an apparent macular hole.

Fig. 4.

Horizontally oriented scan of the left macula and fovea with a portable cart spectral domain OCT system with a hand-held camera after vitrectomy and removal of preretinal hemorrhage. The image shows a macular pseudo-hole with diffuse retinal thickening and trace nasal intraretinal fluid but preserved outer retinal layers and ellipsoid zone throughout. The image also shows residual hyperreflective preretinal tissue temporally with signal blockage corresponding to the vertical perimacular gray line seen in Figures 1 and 3. Scott et al⁴ detailed the multiple retinal OCT findings that may be associated with such a perimacular line.