



Intravitreal Bevacizumab in Management of Persistent Secondary Macular Hole with Epiretinal Proliferation

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ABSTRACT

Background: Aetiology for non-closure of full-thickness macular hole (FTMH) becomes crucial in determining the method of effective mode of intervention. Association of epiretinal proliferation (ERP) along with full-thickness macular hole (FTMH) have shown poorer anatomic and visual outcomes after surgical intervention. Various surgical techniques have been described in literature for treatment of persistent MH.

Case: We report a 60-year-old female patient with FTMH secondary to branched retinal vein occlusion (BRVO) initially associated with ERP.

Observations: She was successfully managed by treating with combination of intravitreal injection of off label bevacizumab (Avastin) (1.25 mg/0.05 ml) and pure gas of SF₆ (1 cc) under topical anaesthesia after an initial surgical intervention.

Conclusion: Presence of ERP in retinal vein occlusion cases needs closer and frequent follow up. IVB can be used as an adjunct in treating secondary MH

Key words: Avastin; failed macular hole closure; secondary macular hole.

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INTRODUCTION

Pars plana vitrectomy (PPV) and internal limiting membrane peeling (ILMP) and gas tamponade remains the treatment basis for both Idiopathic and secondary macular hole (MH) though Gass' hypothesized that the tangential vitreomacular traction was the key factor in the pathogenesis of Idiopathic MH (Gass, 1988). Good visual outcome with 88% of type 1 closure of MH has been noted after surgical intervention in MH secondary to tractional retinal detachment (Babu et al., 2021). There are various techniques described in literature including major surgical interventions (Reid et al., 2020) and minor procedures like gas tamponade injections for treatment of persistent MH (Iwase and Sugiyama, 2007) (Kannan et al., 2016). Etiology for non-closure of MH is crucial in deciding the method of effective intervention (Li et al., 2021).

CASE REPORT

A 60-year-old female, previously treated for right eye (RE) branch retinal vein occlusion (BRVO) macular edema (ME) presented with sudden painless reduced vision for one-week

duration. She had received a total eight doses of intravitreal bevacizumab (IVB) for ME previous year following which she had stable best corrected visual acuity (BCVA) of 6/24 for the last 10 months.

On examination, her BCVA was counting fingers close to face (CFCF) in the RE and 6/6, N6 in the left eye (LE). Anterior segment examination was normal in both eyes with a clear lens. The right fundus showed sclerosed vessels, old flame shaped intraretinal haemorrhages, neovascularization elsewhere (NVE) in inferotemporal quadrant, epiretinal membrane with FTMH and a healthy optic disc. The LE fundus was normal. Intraocular pressure (IOP) was 12 mmHg and 13 mmHg in the right and left eye respectively. Her recent optical coherence tomography (OCT) before current visit showed lamellar MH with epiretinal proliferation (ERP) (Figure 1a). OCT on present visit, confirmed the diagnosis of secondary FTMH. (Figure 1b) She underwent sectoral laser photocoagulation followed by PPV, endolaser, internal limiting membrane (ILM) peeling, fluid air exchange with 12% C3F8 gas as tamponade two weeks later (Figure 2). Standard post-operative care included topical steroids, cycloplegics and

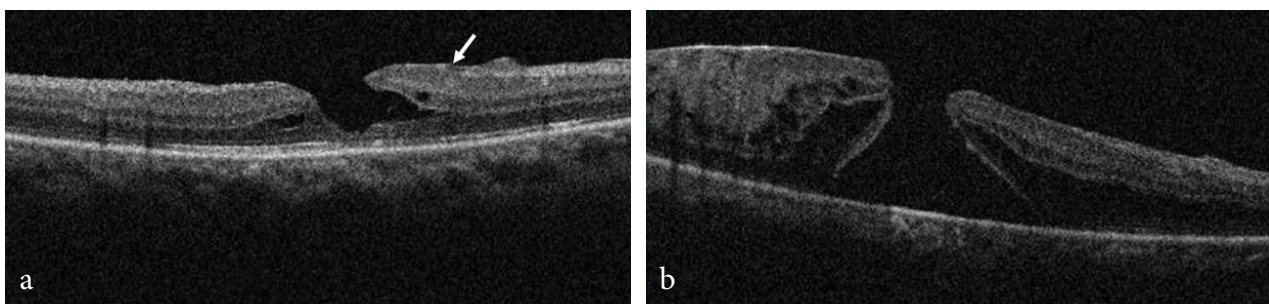


Figure 1: Optical coherent tomography (OCT) of the right eye during initial stable vision showing epiretinal proliferation with lamella macular hole (white arrow) (1a). OCT done on presentation with recent reduced vision showing full thickness macular hole. (1b)

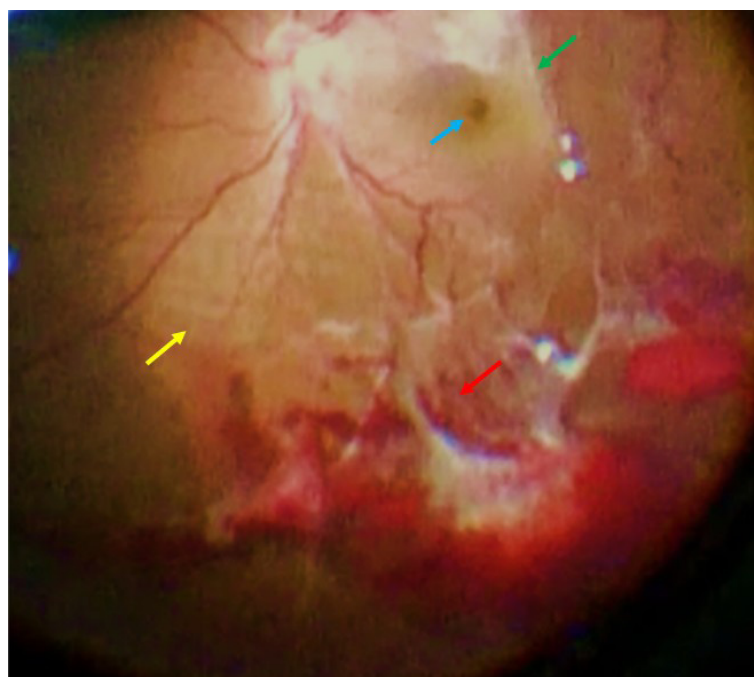


Figure 2: Colour fundus photo showing epiretinal membrane (green arrow) with full thickness macular hole (blue arrow), fresh laser marks (yellow arrow) and Presence of new vessel proliferation (red arrow) in infero temporal quadrant.

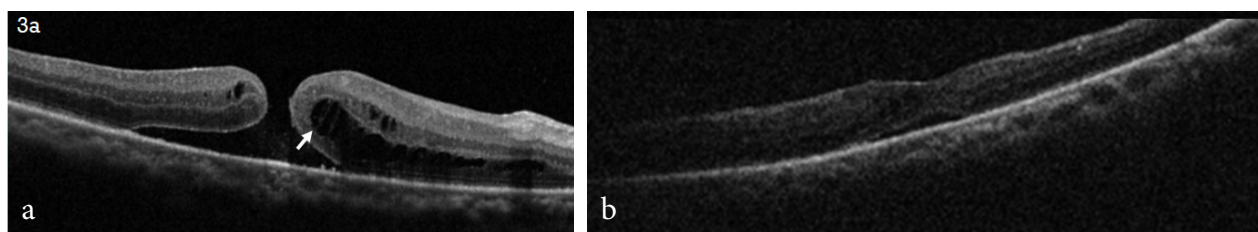


Figure 3: OCT 3 weeks after primary surgical intervention showing persistent macular hole with ME and cystic changes (white arrow) (3a). OCT 1 month after combination injection of intravitreal bevacizumab and pure SF6 gas, showing close macular hole with resolved thickening and cystic changes and residual resolving subretinal fluid. (3b)

broad-spectrum antibiotics. A face down positioning was advised. On the third week follow up, RE BCVA was CFCF with 15 mgHg IOP. OCT revealed persistent MH with ME and cystic changes along the edges of the MH (Figure 3a). A combination of IVB (1.25mg/0.05ml) to address the cystoid macular edema (CME)

component and pure SF6 (1 cc) to aid the closure of MH was performed under topical anaesthesia. During the procedure, multiple paracentesis was performed before and after injections to avoid sudden raised intraocular pressure. A face down position was advised. Though her IOP was 35 mmHg on the same

day, it was <22 mmHg within one week with topical timolol 0.5% and oral acetazolamide. One-month follow-up, BCVA had significantly improved to 6/18 with early cataract changes (grade 2 nuclear sclerosis). Fundus showed closed MH with regressing new vessels in the inferotemporal quadrant. OCT showed closed MH with significant reduction cystic changes and retinal thickening (Figure 3b) six months follow-up, BCVA was maintained with healthy optic disc, closed MH and an IOP of 10 mmHg without antiglaucoma medications. Patient consent statement: Written consent to publish case details was obtained from the patient.

DISCUSSION

Epiretinal proliferation with lamella hole was an associated finding in our patient during her earlier follow-up before developing secondary full thickness MH. ERP has been found to be associated not only with FTMH, but also with retinal vascular disorders like central retinal artery occlusion and BRVO (Chehaibou et al., 2020). ERP in association with full thickness macula have shown poorer anatomic and visual outcomes after surgical intervention in the form of pars plana vitrectomy (Wang et al., 2019).

Failed closure of MH in our case was possibly because of recurrence of ME, post-surgery either due to inflammation induced by surgery or due to persistent ischemia secondary to BRVO. MH with CME can have degeneration and atrophy of the outer retina in the swollen area, which may prevent retracted inner retina from approximating (Reid et al., 2020). Favourable response after using IVB in our case substantiates the probable cause could be related to retinal edema secondary to either

ischemia or surgically induced inflammation. Intravitreal triamcinolone acetonide is shown to be useful in management of persistent macular hole secondary to inflammatory ME after a primary macular hole surgery (Sen et al., 2020). In our case we preferred Bevacizumab because of the presence of neovascularization which was more suggestive of ME secondary to ongoing ischemia. A fundus fluorescein angiography (FFA) can aid us in differentiating the aetiology of edema and help in appropriate choice of intravitreal injection.

Revision surgeries for failed closure of MH are based on the etiology of failure. These include repeat ILM peeling, removal of remnant ILM at the foveal borders, changing tamponade with no complementary peeling, inverted flap techniques, and ILM transfer with gas tamponades. Rate of closure of such MH has been shown to be more than 50% after repeat surgery (Reid et al., 2020). Minor procedures like intravitreal Injection of pure gas has also proven to be successful in persistent MH after primary surgical intervention (Iwase and Sugiyama, 2007). Complications like ocular hypertension and central retinal artery occlusion are known to occur after such a procedure. In our case we were cautious with regular monitoring of the IOP, as the initial spike was expected with combined injections. Multiple paracentesis during the procedure played a significant role in reducing the immediate IOP.

Slit lamp fluid gas exchange is an office procedure which can be considered to avoid abrupt spikes in IOP (Landers et al., 1985). Other office techniques like face-down technique or horizontal fluid gas exchange techniques can be considered in phakic patients (Landers et

al., 1985). The reason for failed closure was probably because of CME secondary ongoing ischemia. Hence, we opted to combine IVB which helped in resolution of ME along with intravitreal pure SF6 gas Injection as tamponade agent aiding the MH closure. Further the procedure was minimally invasive under topical anaesthesia with less discomfort, reducing the risk of intraoperative and post-operative complications of a repeat surgery.

CONCLUSION

Presence of ERP in retinal vein occlusion cases needs closer and frequent follow up. IVB can be used as an adjunct in treating secondary MH

with ME failing to respond to standard PPV, ILM peeling, endolaser, and fluid air exchange. It can achieve anatomical closure and a good visual improvement.

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