Post Trabeculectomy - Good ‘Bleb’ with Poor IOP Control: Management Options

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**CASE HISTORY**

A 42 year old gentleman presented to our glaucoma clinic with history of Primary Open Angle Glaucoma, diagnosed 2 years back and presently on Timolol and Bimatoprost eye drops. The IOP was 30 mm Hg BE with applanation on his present medications. Fundus examination showed 0.8 glaucomatous cup in the right eye and 0.9 cupping in the left eye. Field studies revealed typical glaucomatous field loss in both eyes. Visual acuity was 6/9 (uncorrected) in both his eyes and improved to 6/6 with a correction of +0.50 D sph. He had a strong positive family history of glaucoma with his father and elder brother having the disease. Father was blind due to the disease from his 60\(^{th}\) year of age.

Since his IOP was not getting controlled with the present topical medications, considering the family history and his age, trabeculectomy was planned. Trabeculectomy, (with intraoperative topical antimetabolites) was performed in the left eye. On the first and third post operative days, the IOP was 12 mm Hg in the operated eye, with a good bleb. He was discharged with advice to continue antiglaucoma medications in the RE and antibiotic steroid combination and atropine in left eye. One week review showed IOP at 12 mm Hg left eye. He was asked to review after 2 weeks with plan to do surgery in the right eye. At 3\(^{rd}\) week review IOP in the operated eye was 25 mmHg. Eye was quiet with a good bleb.

**How will you approach the case at this stage?**

**Prologue**

When we brought up this case for discussion, we left a few lacunae so that our teachers can question and initiate a discussion.

We expected that our experts’ panel would be asking us:
1. What was the anterior chamber depth like?
2. Was the trabeculectomy ostium open?
3. Can a “good bleb” be associated with raised IOP, in the usual course?
4. Was the patient a steroid responder?

As expected, majority of the experts covered all these lacunae and discussed the case at length. Here is what the panel had to say.........
Prof. Dr. Velayutham

Here is my opinion on the clinical situation you have mentioned in your letter:

1. It is not mentioned whether the anterior chamber is normal, deep or shallow. It is not clear in the case report whether the bleb is functioning or not. If the bleb is functioning then the filtration is not sufficient. You can try laser suturolysis.

2. A Gonioscopy must be performed, the internal ostium must be viewed, and a note as to whether there is any iris periphery incarceration partially occluding the ostium is made. In that case laser over the peripheral iris may be attempted.

3. If the bleb is cystic, needling of the bleb is to be attempted.

4. Patient also needs to be put on anti-glaucoma medication.

5. Do an Ultrasound to find out if there is any choroidal haemorrhage and if the AC is shallow an UBM is to be done to rule out Malignant Glaucoma. After successfully managing the left eye, the right eye can be taken up for trabeculectomy with antimetabolites and releasable sutures.

Dr. Noel Moniz

I assume that this is a case of POAG and that narrow angles have been excluded by indentation gonioscopy. First of all, we must try to find out the cause for the failure. I would do a gonioscopy to check the internal ostium and see if any iris, vitreous or debris is plugging the ostium. Look for any excessive conjunctival scarring which could also be a cause for a failing bleb. I would have very much liked to see a photograph of the bleb. A UBM would tell us of the type of bleb and any chance of the bleb getting encysted at this stage is highly unlikely. A digital massage may be tried which is unlikely to work at this stage. Then the option would be to go in for bleb needling which may be repeatedly done to break the encystment phase. Failing this, an augmented bleb revision is the choice. Both these methods help us to preserve the conjunctiva for further procedures. If one does repeated needlings or bleb revision the IOP should be kept under control all the time to prevent further damage to the optic nerve. One possibility of the patient being a steroid responder should be kept in mind.

If this also fails then I would discuss with the patient the possibility of resurgery or continuing on topical medication to obtain the IOP optimal for him which should be in the low teens. If I decide on resurgery, I like to see the patient on first postoperative day and thereafter on day 4, day 7, day 14, day 21. I either like to do a digital massage or a releasable suture. The option of laser suturolysis is a modality I am not very fond of.

Dr. Andrew Braganza

This is a very unusual situation. Failure of a filter in the early postoperative period is unlikely to be associated with a “good bleb”. I think a few more details are required. Is the bleb diffuse and avascular or localized? What is the anterior chamber depth and configuration? Is the patient a documented or suspected steroid responder? What is the gonioscopic appearance of the internal ostium at this stage? All these are relevant and will influence further management.

If the bleb is localized and/or vascular, the rise in pressure indicates failure of the filter either due to restricted flow through the ostium or fibrosis around the bleb with incipient encapsulation. Gonioscopy would show whether there is pigment, iris, or even vitreous obstructing the internal opening. (Yes, I have seen trabeculectomies in phakic patients with vitreous in the internal opening; possibly the surgeon was over enthusiastic in grasping the iris during the PI and ruptured zonules as well) It would also confirm adequate excision of the block. Why wasn’t the pressure rise seen earlier if there was obstruction to flow at this level? Postoperative ciliary “shutdown” may have masked the failure due to relative hypotony. Some flow through the filter may have allowed the bleb to stay formed. Or, if iris or vitreous is blocking the ostium, this may be a recent event. Even a partial block would result in elevation of IOP without complete flattening of the bleb. Careful attention to the appearance of the bleb would give a clue to this. Gonioscopy is mandatory, preferably with a Sussmann or equivalent indentation gonioscope which can be used safely even on the first postoperative day. A YAG laser can be used to clear the ostium if blocked.

If the bleb is in the process of getting encapsulated, needling and 5 FU injection is indicated. If it is felt that obstruction at the level of the scleral flap is the problem, laser suturelysis or release of a releasable suture if present could be done first. If needling becomes necessary, the surgeon has the choice of puncturing or...
lifting the scleral flap during the procedure.

The next possibility is malignant glaucoma. This can occur at any time and is more common in eyes with angle closure glaucomas rather than POAG. It has been well described and I have seen it occur even while patients are on atropine. It is also important to realize that hypotony with choroidal effusions can subsequently lead on to aqueous misdirection caused by rotation of the ciliary body. The configuration of the anterior chamber offers a clue. If this diagnosis is suspected, my preference is to perform Chandler’s four step diagnostic and therapeutic procedure. In any case, whatever surgery is performed, additional injections of 5 FU are mandatory if the long term success of the operation is to be improved.

The most difficult situation to diagnose, prove and handle is a steroid response following trabeculectomy. Withdrawing the steroid is not really an option here, as the resultant rebound inflammation is likely to cause the filter to fail completely. Also, challenging the other eye with steroids to establish the diagnosis is dangerous in the presence of advanced glaucomatous damage. My preferences in a situation like this when I suspect a steroid response is to do everything possible to make the filter work better. This starts with direct and indirect massage and 5 FU injections and goes on to suturelysis and needling as indicated. In my experience, the fear that hypotony will result when steroids are eventually withdrawn is not borne out by fact. There is always the option of restarting topical medications. Timolol, alone or in combination with dorzolamide is what I would use. However, starting anti glaucoma medications means we are giving up on the trab which I feel is too early.

What about the other eye? Well, it is not a good idea to rush into surgery in the other eye when we have a situation that we have failed to control here. Settle and stabilize this eye, then go on to the other is my preference.

A final word to the wise. Doing a trabeculectomy is not terribly difficult. Understanding the changes in aqueous dynamics and monitoring the patient with appropriate interventions postoperatively is a major challenge. This is why I generally ask my trabeculectomy patients to stay admitted for a week after the surgery and monitor them closely for a few weeks thereafter.

Epilogue

Now we shall discuss the line of management adopted for this patient.

The anterior chamber depth was adequate and gonioscopy showed open angles with the trabeculectomy ostium open. The PI was patent and the root of iris included in the PI on gonioscopy. The eye was quiet with very little congestion.

In the absence of inflammation and obstruction to out flow via the trabeculectomy ostium,a raised IOP occurring about three weeks after surgery and topical steroids, we presumed this to be a steroid responder. We gave the patient 250 mg Acetazolamide and the IOP was 18 mm Hg at two hours. As the IOP was no longer at very dangerous levels we maintained the patient on Acetazolamide 125mg thrice daily (we preferred this because, for short term, systemic acetazolamide is a good drug and on stopping, it washes out within 72 hours).

Also we switched to a lower potency steroid with negligible propensity for rise in IOP, viz., Fluorometholone and kept the patient on follow up every 48 hours. We maintained the patient on follow up every 48 hours. The IOP was 14 mmHg after 10 days and we withdrew Acetazolamide. By three weeks the IOP was still 14 mmHg. As it was now 6 weeks post op and the eye was not congested, we tapered off the topical Fluorometholone over 2 more weeks. By then IOP was 14 mmHg with an adequate bleb and well formed AC. And we have scheduled surgery for the other eye in a few week’s time. Being an advanced POAG inadequately controlled with maximum medical therapy, surgery is indicated in that eye also. This time we intend to use Fluorometholone in the postoperative period.

In this case as steroid response was picked up early, stopping Prednisolone acetate drops could reverse the raised IOP. This emphasizes the need to check IOP at timely intervals to look for a steroid response in any patient on whom steroids are started. If situation is allowed to go on for some time then the IOP may not normalize on withdrawing steroids alone.

References
