

Commentary: Long term outcomes of blebs repaired with scleral patch graft and conjunctival advancement in late-onset leak post-trabeculectomy

Spontaneous late bleb leaks occur in glaucoma filtering surgery after adjunctive use of anti-metabolites. The frequency of late-onset bleb leak seems to be increasing due to the increased use of Mitomycin C as an adjunct.^[1] Late-onset bleb leaks occur from three months to years after surgery; the reported mean time was 27.9 months.^[2] Sight-threatening complication of the use of anti-fibrotic agents is long-term degeneration/necrosis of deep tissue at the site of trabeculectomy. This complication reduces outflow resistance and causes hypotony with or without a filtering bleb leak. Re-establishing controlled flow resistance in combination with repair of the conjunctival surface is the key for the treatment of low intraocular pressure with or without a filtering bleb leak. Tissue quality can be altered by the use of an anti-fibrotic agent; surgical repair of the low outflow resistance may be challenging if the defect is large or if the tissue quality does not allow for suturing. Melted sclera with soft myxoid tissue is encountered, requiring replacement of the deep tissue layers with complete closure of the fistula. Simple repair of the conjunctiva may fail in the long term. Pressure load to the conjunctiva needs to be reduced by increasing scleral outflow resistance and by directing aqueous flow away from the limbus. Recurrence of bleb-related complications is likely if this is not achieved.^[3]

The goal of treatment is to seal the leak, eliminate hypotony, and maintain the target IOP by preserving a functional filtering bleb. Histological studies have shown that anti-fibrotic use is associated with blebs that are less vascular with thinner epithelium and an atrophic stroma.^[2] Conservative measures include observation and a short course of topical antibiotics, aqueous suppressants, bandage contact lens, and pressure patching. Other methods include surgical approaches such as direct suturing of the leak margins, application of cyanoacrylate or fibrin glue, trichloroacetic acid, application of Argon laser/cautery, or autologous blood injection into the leaking bleb.^[1]

Conjunctival compression sutures have been used to induce adherence of conjunctiva to underlying tissues, the limitation being that it affects only the area of the conjunctiva that is compressed and may not function well when there is diffuse conjunctival chemosis. All patch graft materials have been shown to decrease devastating complications of tube bleb leaks with variable success rates.^[4] The choice of material is vital and depends on its affordability and availability. One needs to remember about the cosmetic appeal while considering the ease of post-operative maneuvers such as laser suturelysis and monitoring the host site.^[5]

Another effective technique for repairing defects is using the anterior stromal lamellae of the donor cornea as a patch graft. Although scleral and corneal tissue has different biomechanical properties, none of the corneal patches showed melting or instability during follow-up. Imaging showed complete embedding of the graft in the host tissue. Corneal tissue is ideal

as its high mechanical stability allows tight suturing which is necessary if the defect is extending into the limbal region or cornea.^[3] Wigton *et al.*^[6] also demonstrated better results with glycerol preserved corneas.

Preexisting bleb needs to be excised by a conjunctival peritomy. Posterior conjunctival relaxing incisions were done close to the fornix and were made to reduce excessive tension on the surrounding conjunctiva when required.

Surgical procedures used to repair leaking blebs include conjunctiva advancement with or without a relaxing incision, scleral patch graft in association with conjunctival advancement, free conjunctival autograft with removal of existing bleb, and autologous conjunctival resuturing of filtering blebs.^[7] Catoira *et al.*^[8] mentions about advancement of conjunctiva in which the preexisting filtering bleb is left intact. Conjunctival advancement with excision of preexisting bleb is superior to conjunctiva advancement alone. The presence of preexisting bleb leads to an increased incidence of recurrent bleb leak as a result of retained epithelial inclusion as to the development of bleb dysesthesia. Budenz *et al.*^[9] described bleb excision with conjunctiva advancement for late-onset bleb leaks. Laspas *et al.*^[10] compared both groups of bleb revision, one with conjunctival advancement and another with patch sclera wherever there is a leak, and found both to be effective in controlling IOP.

Surgeries where Mitomycin over 4 mg/ml was used were less likely to need additional glaucoma medications at the last postoperative visit after bleb revision than those who had received 0.2 mg/ml. The interval between bleb leak and anti-metabolites assisted glaucoma surgery was approximately 2 years.^[1]

Bleb excision with evaluation of the underlying scleral flap is a critical step in bleb revision, particularly in patients who demonstrate hypotony in the absence of a frank conjunctival leak. This allows for placement of additional sutures or a patch graft to secure an over filtering bleb.^[7] The leaking bleb may transform later into a nonfunctional filtering bleb when conjunctiva advancement flap is performed. In these circumstances, a repeat trabeculectomy or a glaucoma drainage implant is warranted. After repair, they need to be monitored to rule out a transient spike in IOP, persistent shallow anterior chamber, and persistent hypotony. Cosmetically significant ptosis or hyperopia has been rarely reported following conjunctiva advancement.

The authors need to be appreciated for reporting a long follow-up of a case series, all performed by a single surgeon with a uniform technique of patch graft and suturing. It is also appreciable to have Phacoemulsification be combined with BLR, whenever required. On presentation, none of the eyes had blebitis, which was the strength of this study.

The limitations of this study were that it was small in number and retrospective as the authors had mentioned. The use of adjuvants was not definite in the index Trabeculectomy in three cases and in another 10 cases, the dose of the MMC used in the index Trabeculectomy was not defined.

In this article, the authors have mentioned about application of 4–6 sutures and laser suturelysis of the apical sutures in the immediate post-operative period for controlled drainage. Alternatively, a single central box suture can be applied to fix the patch graft.

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