Section: Ophthalmology

Original Research Article

EVALUATION OF EFFICACY AND SAFETY OF CONTACT LENSES IN GLAUCOMA PATIENTS UNDERGOING TRABECULECTOMY AT A TERTIARY CARE HOSPITAL

Suvidha Mahar[1], Anzar Ahmed[2], Summy Bhatnagar[2]

[1]*Associate Professor, Department of Ophthalmology, Rajshree Medical Research Institute, Bareilly, Uttar Pradesh, India.*
[2]*Assistant Professor, Department of Ophthalmology, Rajshree Medical Research Institute, Bareilly, Uttar Pradesh, India.*

Received *: 28/08/2025*
Received in revised form *: 21/09/2025*
Accepted *: 07/10/2025*

Corresponding Author:
Dr. Suvidha Mahar,
Associate Professor, Department of Ophthalmology, Rajshree Medical Research Institute, Bareilly, Uttar Pradesh, India.
Email: suvimahar@gmail.com

DOI: 10.70034/ijmedph.2025.4.385

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (4); 2149-2154

ABSTRACT

Background: Trabeculectomy remains a cornerstone surgical procedure for achieving long-term intraocular pressure (IOP) control in glaucoma. However, postoperative wound healing responses, ocular surface disturbance, and bleb instability may compromise outcomes. Therapeutic (bandage) contact lenses are increasingly utilized to enhance epithelial healing, improve patient comfort, and optimize bleb morphology, yet evidence regarding their efficacy and safety in trabeculectomy patients, particularly in the Indian population, remains limited.

Aim: To evaluate the efficacy and safety of therapeutic contact lenses in the postoperative management of glaucoma patients undergoing trabeculectomy at a tertiary care hospital.

Materials and Methods: This prospective, observational study included 45 patients with medically uncontrolled primary open-angle or angle-closure glaucoma who underwent trabeculectomy followed by postoperative application of a soft bandage contact lens. Patients were assessed for IOP reduction, visual acuity improvement, bleb morphology, ocular surface health, and contact lens–related complications. Pre- and postoperative parameters including IOP, BCVA, TBUT, Schirmer's test values, and corneal epithelial integrity were recorded and analyzed.

Results: The mean postoperative IOP showed a significant reduction from 27.96 ± 3.58 mmHg to 15.24 ± 2.71 mmHg ($p < 0.001$). Visual acuity improved significantly (0.80 ± 0.26 to 0.43 ± 0.23 logMAR; $p < 0.001$). Tear film stability and ocular surface parameters improved, with TBUT increasing by 3.16 seconds ($p < 0.001$) and Schirmer's test values rising by 2.46 mm ($p = 0.008$). Favorable bleb characteristics were noted, with 73.33% showing ideal height and 80.00% exhibiting mild vascularity. Corneal epithelial integrity remained intact in 88.89% of patients. Contact lens–related complications were minimal: foreign body sensation (15.56%), redness (11.11%), superficial keratitis (6.67%), lens intolerance (4.44%), and microbial keratitis (2.22%). Overall, 73.33% of patients reported excellent satisfaction, and 71.11% achieved excellent IOP control.

Conclusion: Therapeutic contact lenses significantly improved postoperative outcomes following trabeculectomy by enhancing ocular surface healing, maintaining favorable bleb morphology, and providing effective IOP reduction. Complications were minimal and manageable, supporting the safety and clinical value of contact lenses as an adjunct in postoperative glaucoma management.

Keywords: Trabeculectomy, Glaucoma, Therapeutic contact lens, Intraocular pressure, Bleb morphology.

INTRODUCTION

Glaucoma remains the leading cause of irreversible blindness worldwide, imposing a substantial and growing public-health burden as populations age and longevity increases. Despite advances in diagnostics and therapeutics, millions of people either progress to moderate–severe visual impairment or ultimately to blindness, with regional inequities in access, detection, and treatment magnifying this burden. Contemporary meta-analytic estimates suggest that in 2020 approximately 3.61 million people were blind and 4.14 million had moderate or severe visual impairment attributable to glaucoma; importantly, glaucoma accounted for about 8.39% of all global blindness, underscoring the magnitude of the condition and the urgent need for effective, sustained intraocular pressure (IOP) control across diverse health-care settings.[1] The epidemiological trajectory has long pointed toward continued growth in affected individuals, driven by demographic expansion and aging, with early projections already anticipating a steady rise in glaucoma prevalence through mid-century.[2]

Lowering IOP remains the only evidence-based strategy proven to slow or halt glaucomatous optic neuropathy. In routine practice, medical therapy and office-based laser procedures (for example, selective laser trabeculoplasty) often provide first-line control; however, a meaningful subset of patients either presents with advanced damage or fails to achieve target pressures despite maximal non-incisional therapy. For these individuals, incisional surgery is central to vision preservation. Among the surgical armamentarium, trabeculectomy—first described in 1968—continues to occupy a pivotal role because it can reliably achieve low target IOPs, particularly in eyes with advanced disease requiring single-digit or low-teens pressures. Even as glaucoma drainage devices and minimally invasive glaucoma surgery (MIGS) have expanded options, comparative reviews emphasize that trabeculectomy remains the benchmark subconjunctival filtration procedure against which many alternatives are measured.[3] The long-term success of trabeculectomy hinges on the formation and maintenance of a functioning filtering bleb—an engineered outflow route in the subconjunctival space. Because bleb characteristics evolve dynamically during healing, meticulous postoperative assessment is essential. While slit-lamp examination and clinical grading systems provide valuable surface-level information, anterior-segment optical coherence tomography (AS-OCT) now enables high-resolution visualization of intrableb architecture, including wall thickness, reflectivity, fluid cavity dimensions, and microcyst patterns. Correlations between these structural parameters and surgical success are increasingly recognized, supporting a more objective, image-guided approach to postoperative decision-making, titration of antimetabolites, and timely interventions.[4]

Equally critical is the biology of wound healing, as exuberant fibroproliferation in the conjunctiva and Tenon's capsule can constrict the newly created outflow pathway ("ring-of-steel"), leading to IOP elevation and surgical failure. Decades of practice have cemented the role of anti-fibrotic modulation—most commonly mitomycin C (MMC) and 5-fluorouracil—to blunt scarring, but responses are variable and toxicity is a concern. Current translational and clinical research is advancing a broader wound-modulation toolkit that spans anti-VEGF strategies, integrin and TGF-β pathway inhibition, ROCK inhibition, and other targeted approaches, all aiming to preserve bleb function while minimizing adverse effects. These insights frame trabeculectomy not as a single event but as a biologically active process requiring deliberate modulation to sustain outflow and vision.[5]

Postoperative surface integrity and patient comfort are also integral to outcomes. Filtering blebs alter the ocular surface milieu, and many trabeculectomy candidates have pre-existing ocular surface disease (OSD) from chronic topical therapy. The interplay among preservatives (for example, benzalkonium chloride), meibomian gland function, tear-film stability, and epithelial health influences symptoms, medication tolerance, and even bleb health. Comprehensive management that mitigates ocular surface inflammation and optimizes tear-film homeostasis is therefore inseparable from pressure control and surgical success.[5]

Advances in imaging, diagnostics, and consensus-based care pathways now emphasize pre-, intra-, and postoperative strategies that prioritize surface protection alongside filtration efficacy—an approach particularly relevant when adjunctive devices such as contact lenses are considered. [1] Within this context, therapeutic soft bandage contact lenses (BCLs) have emerged as a pragmatic adjunct in selected postoperative scenarios. Historically, large-diameter soft lenses were used to tamponade early bleb leaks, protect friable conjunctiva, and promote epithelialization, particularly when clinicians wished to avoid immediate surgical revision. Early clinical series demonstrated that supersized lenses could successfully cover the bleb dome and adjacent leak, reducing mechanical shear forces from blinking and decreasing fluid egress. These observations established a physiologic rationale for short-term lens wear as a conservative bridge while tissue adhesion and epithelial healing progressed.[6,7]

Present study was conducted to evaluate efficacy and safety of contact lenses in glaucoma patients undergoing trabeculectomy at a tertiary care hospital.

MATERIALS AND METHODS

This was a prospective, observational study conducted in Department of Ophthalmology, Rajshree Medical Research Institute, Bareilly, Uttar Pradesh (India) from January 2024 to June 2025. The

study aimed to assess clinical outcomes, ocular surface health, and postoperative complications associated with contact lens use as an adjunct in the postoperative management of trabeculectomy.

A total of 45 patients with medically uncontrolled glaucoma who underwent trabeculectomy were included in the study. All patients were aged above 18 years and provided written informed consent before participation. Both male and female patients were enrolled, and selection was performed using a consecutive sampling method to minimize selection bias.

Inclusion Criteria

Patients diagnosed with primary open-angle glaucoma or angle-closure glaucoma who underwent trabeculectomy and were fitted with therapeutic contact lenses postoperatively were included. All patients had clear corneas, adequate tear film stability, and the ability to comply with postoperative care instructions.

Exclusion Criteria

Patients with active ocular infection, corneal dystrophies, severe dry eye disease, history of hypersensitivity to contact lens material, prior ocular trauma, or any systemic disease affecting wound healing (such as diabetes mellitus or autoimmune disorders) were excluded from the study.

Methodology

All trabeculectomy surgeries were performed under aseptic precautions by experienced ophthalmic surgeons following standard surgical protocols. Postoperatively, soft bandage contact lenses were placed to enhance wound healing and maintain conjunctival integrity. Lenses were selected based on corneal curvature and oxygen permeability index suitable for postoperative eyes. Patients were educated on lens hygiene, and follow-up visits were scheduled at regular intervals to assess healing and detect complications.

Efficacy parameters included intraocular pressure (IOP) reduction (measured by Goldmann applanation tonometry), improvement in visual acuity (Snellen chart), and maintenance of bleb morphology (graded using slit-lamp biomicroscopy). Safety parameters assessed were ocular discomfort, redness, foreign body sensation, corneal epithelial integrity (using fluorescein staining), and any incidence of infection or lens intolerance. Additional evaluations included tear film breakup time (TBUT), Schirmer's test values, and anterior segment optical coherence tomography (AS-OCT) imaging for bleb characteristics.

Statistical Analysis

All clinical findings were recorded in a predesigned proforma. Quantitative data such as IOP, TBUT, and Schirmer's test results were expressed as mean ± standard deviation (SD), whereas categorical data such as presence or absence of complications were expressed in percentages. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 26.0 (IBM Corp., Armonk, NY, USA). Paired t-tests were applied to compare preoperative and postoperative parameters, while chi-square tests were used for categorical variables. A *p*-value of less than 0.05 was considered statistically significant.

RESULTS

Table 1: Demographic & Clinical Characteristics

In the present study, a total of 45 eyes of 45 patients who underwent trabeculectomy with postoperative therapeutic contact lens use were evaluated. The mean age of the study population was 55.73 ± 11.12 years, indicating that the majority of patients belonged to the middle-aged to elderly group. With respect to gender distribution, males constituted a slightly higher proportion of the sample, with 27 patients (60.00%), while 18 patients (40.00%) were females, suggesting a mild male preponderance in the cohort. Regarding the type of glaucoma, primary open-angle glaucoma (POAG) was more frequently observed, accounting for 31 patients (68.89%), whereas angle-closure glaucoma was present in 14 patients (31.11%). The difference in distribution between POAG and angle-closure glaucoma was statistically significant ($p = 0.018$), indicating that POAG was significantly more common in this study group. As for laterality, 24 eyes (53.33%) were right eyes and 21 eyes (46.67%) were left eyes, showing an almost symmetrical involvement of both eyes, with no meaningful lateral predilection.

Table 2: Preoperative and Postoperative IOP and Ocular Surface Parameters

There was a marked and statistically significant improvement in intraocular pressure (IOP) and functional visual outcomes following trabeculectomy with adjunctive therapeutic contact lens use. The mean preoperative IOP was 27.96 ± 3.58 mmHg, which reduced substantially to 15.24 ± 2.71 mmHg in the postoperative period. The mean reduction in IOP was −12.72 ± 3.21 mmHg, and this change was highly significant ($p < 0.001$), reflecting effective surgical IOP control. Best corrected visual acuity (BCVA), measured in logMAR units, also showed significant improvement. The mean preoperative BCVA was 0.80 ± 0.26 logMAR, which improved to 0.43 ± 0.23 logMAR postoperatively. The mean change of −0.37 ± 0.19 logMAR was statistically significant ($p < 0.001$), indicating better visual function after surgery. Tear film stability and tear production also improved following surgery and contact lens use. The mean tear film break-up time (TBUT) increased from 7.36 ± 1.31 seconds preoperatively to 10.52 ± 1.39 seconds postoperatively, with a mean gain of +3.16 ± 1.08 seconds ($p < 0.001$), suggesting enhanced tear film stability and ocular surface health. Similarly, Schirmer's test values improved from a preoperative mean of 10.72 ± 2.08 mm/5 min to 13.18 ± 2.26 mm/5 min postoperatively, with a mean increment of +2.46 ± 1.02 mm ($p = 0.008$).

Table 3: Postoperative Bleb Morphology and Corneal Status

Assessment of bleb morphology at the final follow-up demonstrated that the majority of patients achieved favorable bleb characteristics. Ideal bleb height was observed in 33 eyes (73.33%), whereas a flat bleb was seen in 6 eyes (13.33%) and an over-filtrating bleb in another 6 eyes (13.33%). The distribution pattern of bleb height, particularly the presence of a smaller proportion of over-filtrating blebs, showed statistical significance ($p = 0.042$), suggesting that most patients maintained an optimal bleb profile conducive to effective IOP control without excessive filtration. With respect to bleb vascularity, mild vascularity was the predominant finding, present in 36 eyes (80.00%). Moderate vascularity was noted in 7 eyes (15.56%), and severe vascularity in only 2 eyes (4.44%). The distribution was statistically significant ($p = 0.028$), indicating that the majority of blebs remained relatively avascular or minimally vascularized, which is generally considered favorable for long-term bleb function. Evaluation of the corneal epithelial integrity using fluorescein staining revealed that 40 eyes (88.89%) had an intact epithelium at final follow-up, while punctate erosions were identified in 5 eyes (11.11%). This difference was statistically significant ($p = 0.021$), suggesting that although a small subset experienced superficial epithelial compromise, the overall corneal surface status remained satisfactory in the vast majority of patients.

Table 4: Postoperative Complications Related to Contact Lens Use

Analysis of postoperative complications related to therapeutic contact lens use showed that most adverse events were mild and manageable. Foreign body sensation was reported in 7 patients (15.56%), making it the most common subjective complaint. Redness or conjunctival hyperemia occurred in 5 patients (11.11%), while superficial keratitis was documented in 3 patients (6.67%). The occurrence of superficial keratitis was statistically significant ($p = 0.031$), indicating that although relatively infrequent, it represented a noteworthy contact lens–related complication requiring clinical attention. Lens intolerance was observed in 2 patients (4.44%), and a single case (2.22%) of microbial keratitis was reported, representing a serious but rare complication in the cohort. Importantly, 27 patients (60.00%) did not experience any contact lens–related complications, and this distribution was highly significant ($p < 0.001$).

Table 5: Efficacy and Patient Satisfaction Outcomes

Efficacy outcomes and patient-reported satisfaction scores were predominantly favorable. In terms of IOP control, 32 patients (71.11%) were categorized as having excellent control, 8 patients (17.78%) as good, 4 patients (8.89%) as fair, and only 1 patient (2.22%) as poor. This skew toward the excellent and good categories was statistically significant ($p < 0.001$), reflecting a high level of surgical success in IOP management. Visual acuity improvement followed a similar pattern, with 30 patients (66.67%) showing excellent improvement, 9 (20.00%) good, 5 (11.11%) fair, and only 1 (2.22%) poor, again demonstrating a statistically significant distribution ($p < 0.001$) favoring positive visual outcomes. Patient comfort, based on self-reported responses, was also high. A total of 31 patients (68.89%) rated their comfort as excellent, 7 (15.56%) as good, 5 (11.11%) as fair, and 2 (4.44%) as poor. This distribution was statistically significant ($p = 0.004$), indicating that most patients experienced satisfactory to excellent comfort with postoperative contact lens wear. Overall satisfaction with the procedure and postoperative management was excellent in 33 patients (73.33%), good in 6 (13.33%), fair in 4 (8.89%), and poor in only 2 (4.44%). The highly significant p-value ($p < 0.001$) underscores a strong predominance of positive subjective outcomes.

Table 1: Demographic and Clinical Characteristics (n = 90)

Parameter	Frequency (n)	Percentage (%)	p-value
Age (years)	55.73 ± 11.12	–	–
Gender			
Male	27	60.00	–
Female	18	40.00	–
Type of Glaucoma			
Primary Open-Angle	31	68.89	0.018*
Angle-Closure	14	31.11	
Laterality			
Right Eye	24	53.33	–
Left Eye	21	46.67	

*Significant at $p < 0.05$

Table 2: Comparison of Preoperative and Postoperative Intraocular Pressure (IOP) and Visual Acuity

Parameter	Preoperative (Mean ± SD)	Postoperative (Mean ± SD)	Mean Change	p-value
IOP (mmHg)	27.96 ± 3.58	15.24 ± 2.71	−12.72 ± 3.21	<0.001*
Best Corrected Visual Acuity (BCVA) (logMAR)	0.80 ± 0.26	0.43 ± 0.23	−0.37 ± 0.19	<0.001*
Tear Film Break-Up Time (TBUT, seconds)	7.36 ± 1.31	10.52 ± 1.39	+3.16 ± 1.08	<0.001*
Schirmer's Test (mm/5min)	10.72 ± 2.08	13.18 ± 2.26	+2.46 ± 1.02	0.008*

*Paired t-test, significant at $p < 0.05$

Table 3: Postoperative Bleb Morphology and Corneal Status at Final Follow-up

Parameter	Frequency (n)	Percentage (%)	p-value
Bleb Height			
Ideal	33	73.33	–
Flat	6	13.33	–
Over-filtrating	6	13.33	0.042*
Bleb Vascularity			
Mild	36	80.00	–
Moderate	7	15.56	–
Severe	2	4.44	0.028*
Corneal Epithelial Integrity (Fluorescein Staining)			
Intact	40	88.89	–
Punctate Erosions	5	11.11	0.021*

*Chi-square test, significant at $p < 0.05$

Table 4: Postoperative Complications Related to Contact Lens Use

Complication	Frequency (n)	Percentage (%)	p-value
Foreign Body Sensation	7	15.56	–
Redness / Hyperemia	5	11.11	–
Superficial Keratitis	3	6.67	0.031*
Lens Intolerance	2	4.44	–
Microbial Keratitis	1	2.22	–
No Complications	27	60.00	<0.001*

*Chi-square test, significant at $p < 0.05$

Table 5: Efficacy and Patient Satisfaction Outcomes

Parameter	Excellent	Good	Fair	Poor	p-value
IOP Control	32 (71.11%)	8 (17.78%)	4 (8.89%)	1 (2.22%)	<0.001*
Visual Acuity Improvement	30 (66.67%)	9 (20.00%)	5 (11.11%)	1 (2.22%)	<0.001*
Patient Comfort (Self-Reported)	31 (68.89%)	7 (15.56%)	5 (11.11%)	2 (4.44%)	0.004*
Overall Satisfaction	33 (73.33%)	6 (13.33%)	4 (8.89%)	2 (4.44%)	<0.001*

*Chi-square test, significant at $p < 0.05$

DISCUSSION

Our cohort (n = 45) achieved a mean IOP reduction from 27.96 ± 3.58 mmHg to 15.24 ± 2.71 mmHg (−12.72 ± 3.21; $p < 0.001$), placing our postoperative pressure very close to benchmark trabeculectomy outcomes. For example, the Tube Versus Trabeculectomy (TVT) Study reported a mean IOP of ~14.4 mmHg at 5 years in the tube group, with a large proportion achieving ≤14 mmHg; our mean 15.24 mmHg therefore aligns with high-quality long-term targets despite different surgical contexts. This concordance suggests that adjunctive therapeutic contact lens (BCL) use did not compromise pressure control and may, through improved bleb quality and epithelial protection, support the attainment of target IOPs.[8]

Direct evidence for post-trabeculectomy BCLs complements our efficacy signal. Li et al. randomized 200 eyes to BCL vs no BCL after fornix-based trabeculectomy and found 12-month qualified success 94.7% vs 86.3% and complete success 89.6% vs 80.0% in favor of BCLs, with fewer encysted blebs (7% vs 17%) and larger diffuse bleb areas in the BCL arm. Our results—71.11% rated "excellent" IOP control and 73.33% "excellent" overall satisfaction—are directionally consistent with Li et al., reinforcing that BCLs can enhance surgical success and patient-reported outcomes after trabeculectomy.[9]

Ocular surface metrics in our series also improved: TBUT increased by 3.16 s (7.36 → 10.52 s; $p < 0.001$) and Schirmer rose by 2.46 mm (10.72 → 13.18 mm; $p = 0.008$). Although most controlled data on BCL-mediated tear film improvement comes from other postoperative settings, it is biologically relevant: Chen et al. reported significantly increased TBUT by day 7 and 14 with BCLs after phacoemulsification alongside reduced corneal staining, mirroring the improved stability we observed (albeit after a different surgery). This convergence supports the premise that therapeutic lenses stabilize the ocular surface, which may help explain our high comfort rates (68.89% "excellent").[10]

Bleb quality in our cohort was favorable—ideal bleb height in 73.33% and mild vascularity in 80.00%—and this pattern is congruent with literature linking diffuse, elevated, minimally vascular blebs to better pressure control. Lee et al. summarized the Moorfields Bleb Grading System (MBGS) and its association with surgical outcomes, underscoring that lower vascularity and appropriate height/area correlate with success. Our high proportion of "ideal" height and "mild" vascularity, together with robust IOP reduction, fits the expected phenotype of a functional filtering bleb.[11]

We also specifically examined bleb-leak–related scenarios because BCLs are commonly used as a conservative seal. In Gollakota et al., early post-trabeculectomy bleb leaks treated with large-diameter BCLs (≥15.5 mm) resolved in 17/19 eyes (89.5%), with IOP rising from 5.8 ± 2.7 to 12.5 ± 3.1 mmHg after leak closure and ~89% complete success at 16 months. Although our study was not limited to

leak cases, our low complication burden and stable postoperative IOP are compatible with this report's message: appropriately selected BCLs can protect the bleb and ocular surface while maintaining long-term filtration function.[12]

Safety in our series was reassuring: 60.00% had no complications, and microbial keratitis occurred in 2.22%. Still, vigilance is warranted. Tzamalis et al. identified BCL wear and topical steroids in the early postoperative period as risk factors for microbial keratitis after ocular surgery, highlighting a modifiable risk profile (hygiene, follow-up, judicious steroid use). Our single keratitis case within strict asepsis and education echoes their call for careful monitoring rather than abandonment of BCLs.[13]

This caution is consistent with broader contact-lens epidemiology. The classic series by Ormerod et al. documented 42 cases of contact-lens–associated microbial keratitis over 14 years, with Pseudomonas aeruginosa in 40%—a pathogen of particular concern in postoperative eyes. Our 1/45 (2.22%) keratitis rate is still low relative to historical CL-associated risks, likely reflecting shorter wear times, high-Dk materials, and close follow-up, but it reinforces the need for early reporting of pain/redness and prompt lens removal when indicated.[14]

Finally, the objective grading of bleb morphology provides a framework to interpret our outcomes. Beyond MBGS, IBAGS is also widely used; Seo et al. emphasized that both systems capture clinically meaningful parameters (height, extent, vascularity) that track with function. Our distribution—ideal height (73.33%) and mild vascularity (80.00%)—maps to the "functional" bleb profile described in these systems and aligns with our IOP control (mean 15.24 mmHg) and high patient-reported satisfaction (73.33% excellent).[15]

CONCLUSION

Therapeutic contact lenses proved to be a valuable adjunct in the postoperative management of trabeculectomy, supporting significant IOP reduction and maintaining favorable bleb morphology. The lenses also improved ocular surface stability and patient comfort, contributing to high satisfaction levels. Postoperative complications were minimal and manageable, with only isolated instances of adverse effects. Overall, their use appears safe, effective, and beneficial in enhancing surgical outcomes in glaucoma patients.

REFERENCES

1. Vision Loss Expert Group of the Global Burden of Disease Study; GBD 2019 Blindness and Vision Impairment Collaborators. Global estimates on the number of people blind or visually impaired by glaucoma: a meta-analysis from 2000 to 2020. Eye (Lond). 2024;38:2036-2046. Available from: https://www.nature.com/articles/s41433-024-02995-5
2. Tham YC, Li X, Wong TY, Quigley HA, Aung T, Cheng CY. Global prevalence of glaucoma and projections of glaucoma burden through 2040: a systematic review and meta-analysis. Ophthalmology. 2014;121(11):2081-2090. Available from: https://pubmed.ncbi.nlm.nih.gov/24974815/
3. Ang BCH, Sng CCA, Barton K. Recent advancements in glaucoma surgery—A review. Bioengineering. 2023;10(9):1096. Available from: https://www.mdpi.com/2306-5354/10/9/1096
4. Choudhary TS, Raina UK, Gupta Y, et al. Anterior-segment optical coherence tomography-based evaluation of filtering bleb maturation after trabeculectomy. 2024. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC11288216/
5. Dave B, Kacha K, Pillai M, et al. Wound modulations in glaucoma surgery: A systematic review. Bioengineering. 2024;11(5):446. Available from: https://www.mdpi.com/2306-5354/11/5/446
6. Shoham A, Klemperer I, Barequet IS, Nesher R, Melamed S. Large soft contact lenses in the management of leaking blebs. Cornea. 2000;19(2):159-164. Available from: https://pubmed.ncbi.nlm.nih.gov/10656308/
7. Wu Z, Li M, Wang Y, et al. Soft bandage contact lenses in management of early bleb leak following trabeculectomy. Eye Sci. 2015;30(1):13-17. Available from: https://pubmed.ncbi.nlm.nih.gov/26390792/
8. Gedde SJ, Schiffman JC, Feuer WJ, Herndon LW, Brandt JD, Budenz DL. Treatment Outcomes in the Tube Versus Trabeculectomy (TVT) Study. Ophthalmology. 2012;119(12):2422–31.
9. Li B, Zhang M, Yang Z. Study of the Efficacy and Safety of Contact Lens Used in Trabeculectomy. J Ophthalmol. 2019:1839712.
10. Chen X, Yu Y, Chen X, et al. Efficacy of an ocular bandage contact lens for the treatment of dry eye after phacoemulsification. Exp Ther Med. 2019;17(1):432–8.
11. Lee YS, Kim CY, Hong S. The relationship of bleb morphology and the outcome of trabeculectomy: A review. Korean J Ophthalmol. 2016;30(6):459–71.
12. Gollakota S, Garudadri CS, Mohamed A, Senthil S. Intermediate Term Outcomes of Early Post-trabeculectomy Bleb Leaks Managed by Large Diameter Soft Bandage Contact Lens. J Glaucoma. 2017;26(9):816–21.
13. Tzamalis A, Kapsala Z, Chalvatzis N, et al. Bandage contact lens and topical steroids are risk factors for microbial keratitis after ocular surgery. BMJ Open Ophthalmol. 2019;4(1):e000231.
14. Ormerod LD, Smith RE. Contact Lens-Associated Microbial Keratitis. Arch Ophthalmol. 1986;104(1):79–83.
15. Seo JH, Sun HJ, Lee Y, Kim CY, Hong S. Evaluation of Functional Filtering Bleb Using Optical Coherence Tomography and Association with Clinical Parameters After Trabeculectomy. Transl Vis Sci Technol. 2019;8(4):21.