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Management of Corneal Perforation in a Tertiary Care Hospital: An Observational Study

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ABSTRACT

Background: Corneal perforation is a vision-threatening ophthalmic emergency characterized by a full-thickness defect in the cornea, leading to loss of globe integrity and potential irreversible visual impairment. Prompt diagnosis and appropriate management are essential to restore anatomical integrity and preserve vision. The study was conducted to evaluate the clinical profile, etiological factors, management modalities, and outcomes of corneal perforation in a tertiary care hospital setting.

Methods: This prospective observational study included 60 patients with full-thickness corneal perforation managed over 18 months at a tertiary care hospital. Patients were assessed for demographic characteristics, etiology, site, size, and clinical presentation. Management strategies included medical therapy, tissue adhesive with bandage contact lens (TABCL), Patch graft, amniotic membrane transplantation, and keratoplasty. Outcomes were evaluated based on anatomical integrity, epithelial healing, visual improvement, and complications over a follow-up period of up to three months.

Results: The mean age was 53.27 ± 15.81 years, with a male predominance (60%). Post-infective causes were most common (45%), followed by trauma (30%) and autoimmune conditions (25%). Central perforations (45%) and small-sized defects <3 mm (60%) were predominant. TABCL was the most frequently employed treatment (50%), followed by keratoplasty (25%). Anatomical success was achieved in all cases (100%), with 92% epithelial healing. Visual improvement was observed in 40% of cases, with better outcomes in peripheral perforations (60%) compared to central ones (37%) ($p = 0.0421$). Post-procedural complications were minimal (10%).

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Conclusion: Corneal perforation is commonly associated with infectious etiology and requires a tailored management approach based on size and location. Early intervention using appropriate modalities ensures excellent anatomical outcomes, though visual recovery varies with perforation characteristics.

KEYWORDS

• Corneal Perforation • Keratitis • Tissue Adhesive • Keratoplasty • Patch Graft • Amniotic Membrane Transplantation • Visual Outcome

INTRODUCTION

Corneal perforation represents one of the most serious ocular emergencies encountered in clinical ophthalmology.[1] Any disruption in its continuity not only impairs vision but also exposes the eye to secondary infections, intraocular inflammation, and even endophthalmitis. The management of corneal perforation therefore demands prompt recognition, accurate diagnosis, and timely intervention to preserve both the anatomical integrity of the eye and functional vision.[1,2]

Corneal perforations may result from a wide range of etiological factors, encompassing both infectious and non-infectious causes. Infective keratitis, especially of bacterial or fungal origin, remains the most common cause in developing countries due to the high prevalence of trauma, agricultural exposure, and delayed access to medical care. In developed regions, autoimmune conditions such as rheumatoid arthritis, Mooren's ulcer, and peripheral ulcerative keratitis form important non-infectious causes. Regardless of the cause, once a corneal ulcer progresses to thinning and perforation, the risk of permanent visual disability increases exponentially.[3,4]

Diagnostic confirmation is achieved through slit-lamp biomicroscopy and fluorescein staining, which helps visualize the site of leakage through a positive Seidel test. Ancillary investigations such as corneal scrapings for microbiological analysis, B-scan ultrasonography for posterior segment evaluation, and systemic investigations for underlying autoimmune or infectious conditions are essential to guide management.[4,5]

The management of corneal perforation is primarily directed toward two essential goals: sealing the defect to restore the structural integrity of the globe and treating the underlying cause to prevent recurrence. Small perforations, typically less than 2–3 mm in diameter, may be successfully managed by conservative measures such as tissue adhesives (commonly cyanoacrylate glue) combined with the application of a bandage contact lens.[6] Moderate perforations, usually between 3–6 mm, often necessitate surgical intervention. Autologous tissue grafts, such as Tenon's patch graft and patch grafts, have proven effective in sealing moderate-sized defects. Another valuable option, especially in cases where donor corneal tissue is unavailable, is amniotic membrane transplantation (AMT). In resource-limited settings, AMT offers a feasible temporary measure to maintain globe integrity until definitive keratoplasty can be performed.[7,8]

Large corneal perforations or those involving the visual axis typically require penetrating keratoplasty (PKP) to restore ocular integrity and optical clarity. These procedures replace the damaged or thinned corneal tissue with donor grafts, providing both tectonic support and visual rehabilitation. However, keratoplasty in an actively inflamed or infected eye carries the risk of graft failure, rejection, and postoperative complications such as infection, glaucoma, or cataract formation. Therefore, careful timing of the procedure and preoperative control of inflammation are critical to achieving favorable outcomes.[9]

Advancements in surgical techniques and biomaterials have revolutionized the management of corneal perforations. The introduction of tissue adhesives, biological scaffolds, and lamellar grafting procedures has increased the spectrum of options available to ophthalmologists. Yet, despite these advances, the optimal management remains context-dependent, guided by the availability of resources, surgeon expertise, and the clinical profile of the patient. The complexity of decision-making underscores the importance of a multidisciplinary approach involving cornea specialists, microbiologists, rheumatologists, and ocular surface experts.[10]

The aim of the present study was to observe and evaluate the clinical profile, management modalities, and outcomes of patients presenting with corneal perforation at a tertiary care hospital.

MATERIALS AND METHODS

The prospective observational study was conducted in the Department of Ophthalmology, Basaveshwara Teaching and General Hospital, which is attached to Mahadevappa Rampure Medical College, Kalaburagi, Karnataka, over a period of 18 months (June 2024 to November 2025). Ethical clearance was obtained from the Institutional Ethics Committee before the commencement of the study. A consecutive sampling technique was adopted and a total of 60 patients were included for the study.

Inclusion Criteria

Patients diagnosed with full-thickness corneal perforation of size ranging from <3mm to 6 mm in greatest dimension, of all age groups and genders, willing to provide written informed consent and comply with follow-up visits.

Exclusion Criteria

Patients with open globe injuries resulting from major trauma, perforations secondary to intraocular surgery or chemical burns, as these often require specialized management, who did not consent to participate or were lost to follow-up.

All patients underwent a structured and comprehensive evaluation. Initially, individuals with suspected corneal perforation were examined under slit-lamp biomicroscopy following instillation of fluorescein dye to accurately delineate the epithelial defect. The size and location of the perforation were measured using a slit-lamp reticule or calipers. Detailed assessment included evaluation of the depth of the lesion, presence of surrounding stromal thinning, descemetocele formation, or iris prolapse. Anterior chamber depth, Seidel's test for aqueous leakage, and the integrity of the ocular coats were systematically assessed. Baseline visual acuity was recorded using Snellen's chart.

Subsequently, all patients underwent standard systemic and ocular investigations, including complete blood count, random blood sugar, serological tests for HIV and HBsAg, urine routine examination, and B-scan ultrasonography to assess the posterior segment in cases with media opacity. In clinically suspected infectious etiologies, corneal scrapings were obtained for microbiological evaluation prior to the initiation of antimicrobial therapy.

The management strategy was individualized based on the size and etiology of the perforation. **Small perforations** (<3 mm) were managed with cyanoacrylate tissue adhesive application along with a bandage contact lens following adequate infection control. **Moderate perforations** (3–6 mm) were treated with Patch graft or amniotic membrane transplantation. **Large or centrally located perforations** (>6 mm), as well as cases with failed primary intervention, were managed with therapeutic penetrating keratoplasty. Adjunctive medical therapy included topical antibiotics, antifungals, lubricants, and cycloplegics, along with systemic doxycycline and vitamin C supplementation to facilitate collagen synthesis. The choice of surgical intervention was guided by the underlying etiology, availability of donor tissue, and surgeon discretion, with all intraoperative parameters meticulously documented.

Postoperative follow-up was conducted on day 1, week 1, month 1, and month 3. At each visit, best-corrected visual acuity, graft integrity or healing status, anterior chamber depth, presence of epithelial defects or corneal vascularization, and signs of infection or graft rejection were evaluated. Serial photographic documentation of the cornea was maintained to ensure objective assessment of clinical outcomes, and patients were counseled regarding strict adherence to prescribed therapy and follow-up schedules.

Data were recorded using a revised structured proforma and further entered into Microsoft Excel. Statistical analysis was performed using the SPSS 26.0 version. Descriptive statistics such as mean, standard deviation, and percentage were used for demographic and clinical parameters. Chi-square test and Fisher's exact test were used for categorical variables (e.g., association between type of intervention and anatomical success). Paired t-test was applied to compare pre- and post-intervention BCVA where applicable. A p-value < 0.05 was considered statistically significant.

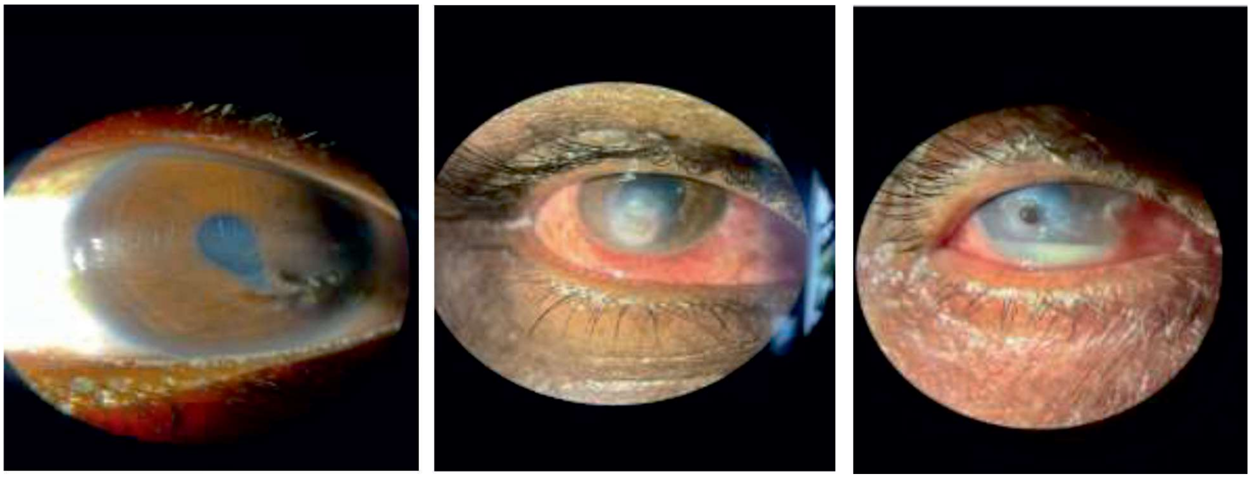
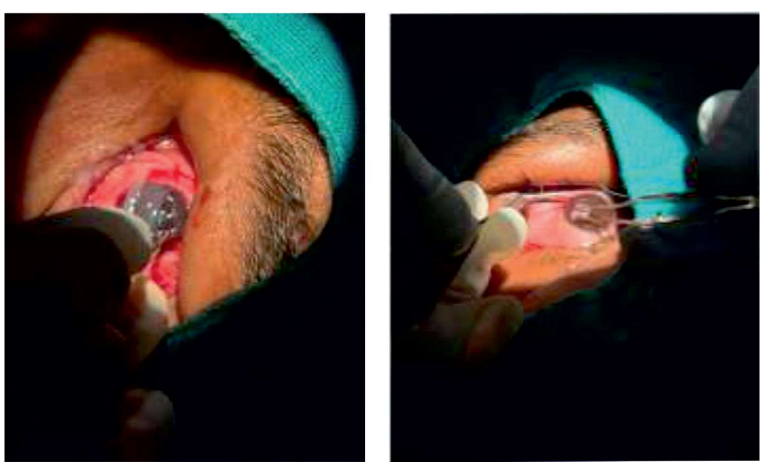


Figure 1: Pre-procedural image of corneal perforation

Figure 2: Procedures TABCL, TPK



Amniotic membrane graft

Figure 3: Post procedural images

Figure 4: Post Procedure follow up

RESULT

Table 1: Baseline demographic characteristics of study participants (n = 60)

Variable	Category	Frequency (n)	Percentage (%)
Age group (years)	≤30	5	8.3
	31–40	8	13.3
	41–50	11	18.3
	51–60	14	23.3
	61–70	13	21.7
	>70	9	15.0
Sex	Male	36	60.0
	Female	24	40.0
Total	–	60	100

The highest proportion was observed in the 51–60 year's age group with 14 cases (23.3%), followed by 61–70 years with 13 cases (21.7%) and 41–50 years with 11 cases (18.3%). Participants aged >70 years accounted for 9 cases (15.0%), while 31–40 years and ≤30 years comprised 8 (13.3%) and 5 (8.3%) cases, respectively.

Males constituted 36 cases (60.0%), while females accounted for 24 cases (40.0%). The distribution shows a higher representation of male patients in the study population, with a difference of 12 cases between the two groups.

Table 2: Distribution of chief complaints among patients (n = 60)

Chief Complaint	Frequency	Percentage
Sudden decrease in vision	19	31.7%
Pain and redness	17	28.3%
Discharge	10	16.7%
Foreign body sensation	6	10%
Watering/photophobia	8	13.3%

The most common chief complaint was sudden decrease in vision, reported in 19 patients (31.7%), followed by pain and redness in 17 patients (28.3%). Discharge was present in 10 cases (16.7%), watering/photophobia in 8 cases (13.3%), and foreign body sensation in 6 cases (10.0%).

Table 3: Etiology of corneal perforation (n = 60)

Etiology	Frequency (n)	Percentage (%)
Post-infective	27	45.0
Trauma	18	30.0
Autoimmune	15	25.0
Total	60	100

Post-infective etiology was the most frequent cause of corneal perforation, observed in 27 patients (45.0%). Trauma accounted for 18 cases (30.0%), while autoimmune causes were noted in 15 cases (25.0%). Thus, infective causes formed the largest etiological category in the study.

Table 4: Characteristics of corneal perforation (n = 60)

Parameter	Category	Frequency (n)	Percentage (%)
Site of perforation	Central	27	45.0
	Paracentral	18	30.0
	Peripheral	15	25.0
Shape of perforation	Round	27	45.0
	Irregular	17	28.3
	Oval	16	26.7
Size of perforation	<3 mm	36	60.0
	3–6 mm	9	15.0
	>6 mm	15	25.0
Depth of perforation	Full thickness	60	100.0
Anterior chamber status	Shallow	54	90.0
	Normal depth	6	10.0
Total	–	60	100

The distribution of corneal perforation characteristics in the present study demonstrates distinct clinical patterns. Central perforations constituted the largest proportion (45.0%), followed by paracentral (30.0%) and peripheral locations (25.0%), indicating a higher predilection for involvement of the visual axis. With respect to morphology, round-shaped perforations were most frequently observed (45.0%), while irregular (28.3%) and oval (26.7%) configurations were less common, suggesting a relatively uniform pattern of tissue loss in a substantial subset of cases.

In terms of size, small perforations (<3 mm) predominated (60.0%), whereas larger defects (>6 mm) accounted for 25.0% and moderate-sized perforations (3–6 mm) for 15.0%, highlighting that the majority of cases presented at an earlier or less extensive stage of tissue disruption. All cases (100.0%) demonstrated full-thickness involvement, reflecting the severity of pathology among the included participants.

Assessment of anterior chamber status revealed that a shallow anterior chamber was present in 90.0% of patients, while only 10.0% had normal depth, indicating significant compromise of globe integrity in most cases. Collectively, these findings suggest that corneal perforations in this cohort were predominantly central, small in size, full-thickness in nature, and frequently associated with anterior chamber shallowing, underscoring the need for prompt and appropriate therapeutic intervention to restore ocular integrity and preserve visual function.

Table 5: Distribution of management modalities (n = 60)

Procedure	Frequency	Percentage
TABCL	30	50%
Tenon's patch graft	11	18.3%
Amniotic membrane graft	4	6.7%
Keratoplasty	15	25%

TABCL was the most frequently used management modality, performed in 30 patients (50.0%). Keratoplasty was done in 15 cases (25.0%), followed by Tenon's patch graft in 11 cases (18.3%). Amniotic membrane graft was the least used procedure, accounting for 4 cases (6.7%).

Table 6: Anatomical outcomes following management (n = 60)

Anatomical outcome	Frequency (n)	Percentage (%)
Restoration of globe integrity	60	100.0
Epithelial healing	55	92.0
Graft clarity (in graft cases)	30	100.0
Corneal vascularization/ haze	6	10.0

Restoration of globe integrity was achieved in all 60 patients (100.0%). Epithelial healing was observed in 60 cases (100.0%). Graft clarity was maintained in 30 cases (100.0%), while corneal vascularization or haze was noted in 6 patients (10.0%). The findings present the distribution of major anatomical outcomes after management.

Table 7: Association Between Location of Perforation and Visual Outcome (n = 20)

Location	Visual Improvement n (%)	No Improvement n (%)	Total
Central (27)	10(37%)	17 (63%)	27
Paracentral (18)	9 (50%)	9 (50%)	18
Peripheral (15)	9 (60%)	6 (40%)	15
Total	24	36	60

p = 0.0421

Among central perforations, visual improvement was seen in 10 cases (37.0%) and no improvement in 17 cases (63.0%). In paracentral perforations, 9 cases (50.0%) showed improvement and 9 cases (50.0%) showed no improvement. Peripheral perforations had improvement in 9 cases (60.0%) and no improvement in 6 cases (40.0%). The association was statistically significant (p = 0.0421).

Table 8: Pre and Post-Procedural Visual Improvement Based on Perforation Size (n = 60)

Size	Improvement n (%)	No Improvement n (%)	Total
<3 mm	18 (50%)	18 (50%)	36
3–6 mm	5 (40%)	7(60%)	12
>6 mm	5(40%)	7 (60%)	12
Total	28	32	60

p = 0.0928

Visual improvement was observed in 18 of 36 patients (50.0%) with perforation size <3 mm, while 18 (50.0%) showed no improvement. In the 3–6 mm group, 5 of 12 patients (40.0%) improved and 7 (60.0%) did not. In the >6 mm group, 5 of 12 patients (40.0%) improved and 7 (60.0%) showed no improvement (p = 0.0928).

Table 9: Post-procedural complications (n = 60)

Outcome	Frequency (n)	Percentage (%)
No complications	54	90.0
Complications present	6	10.0
Total	60	100

No post-procedural complications were observed in 54 patients (90.0%), while complications were present in 6 patients (10.0%). The distribution indicates that the majority of patients remained free of complications after the procedure, with only a small proportion showing adverse post-procedural events.

Table 10: Descriptive statistics of continuous variables (n = 60)

Variable	N	Mean ± SD	Range (Min–Max)
Age (years)	60	53.27 ± 15.81	20 – 79
Pulse (beats/min)	60	76.50 ± 10.94	60 – 98
Respiratory rate (/min)	60	17.50 ± 2.14	14 – 21

The mean age of study participants was 53.27 ± 15.81 years, with a range of 20 to 79 years. Mean pulse rate was 76.50 ± 10.94 beats/min, ranging from 60 to 98 beats/min. Mean respiratory rate was 17.50 ± 2.14/min, with values ranging from 14 to 21/min.

Table 11: Anterior segment findings on examination (n = 60)

Structure	Finding	n (%)
Upper eyelid	Normal	40 (66.6)
	Ptosis	2 (3.3)
	Swelling	18 (30)
Lower eyelid	Normal	21 (35)
	Ectropion	21 (35)
	Edema	18 (30)
Bulbar conjunctiva	Normal	23 (38)
	Congested/Chemosis	37 (62)
Palpebral conjunctiva	Normal	34 (57)
	Hyperemic	26 (43)

Upper eyelid was normal in 40 cases (66.6%), with swelling in 18 (30.0%) and ptosis in 2 (3.3%). Lower eyelid showed ectropion in 21 cases (35.0%) and edema in 18 (30.0%). Bulbar conjunctiva was congested/chemotic in 37 cases (62.0%), while palpebral conjunctiva was hyperemic in 26 cases (43.0%).

DISCUSSION

The present study was undertaken to evaluate the clinical profile, etiological pattern, morphological characteristics, management modalities, and treatment outcomes of corneal perforation in patients presenting to a tertiary care hospital. The aim was to systematically analyze the demographic distribution of affected patients, identify the common presenting symptoms and major underlying causes, assess the site, shape, size, depth, and associated anterior segment findings of corneal perforation, and study the various management approaches used in routine clinical practice.

The study demonstrates that corneal perforation predominantly affects middle-aged and elderly individuals, with a mean age of 53.27 ± 15.81 years and peak incidence in the 51–60-year age group. This age predilection suggests increased vulnerability due to impaired wound healing, ocular surface disease, chronic inflammation, and drug-related epithelial toxicity. Comparable findings have been reported by Asai *et al.*[11] and Masuda *et al.*[12], who described corneal melt and perforation in elderly patients following NSAID exposure.

A male predominance (60.0%) was observed, which may be attributed to greater occupational exposure, higher risk of trauma, and increased environmental contact. Although existing studies do not provide consistent sex-based comparisons, Asai *et al.*[11] reported involvement of both sexes with slight male predominance, whereas Masuda *et al.*[12] described female cases, indicating no fixed sex predilection.

Clinically, sudden decrease in vision (31.7%) and pain with redness (28.3%) were the most common presenting complaints, reflecting acute disruption of corneal integrity and associated inflammation. In contrast, Asai *et al.*[11] reported minimal symptoms despite severe stromal involvement in NSAID-induced corneal melt, highlighting variability in clinical presentation. Rashmi Deshmukh *et al.*[13] similarly noted that symptomatology varies depending on etiology, size, and ocular surface status.

Post-infective etiology was the leading cause (45.0%), followed by trauma (30.0%) and autoimmune disorders (25.0%). This distribution underscores the continued predominance of microbial keratitis as a major cause of corneal perforation in tertiary care settings. Similar etiological patterns have been described by Rashmi Deshmukh *et al.*[13] and Kate *et al.*[14] In contrast, drug-induced perforations reported by Asai *et al.*[11], and Aljehani *et al.*[15] represent a more specific subset, whereas the present study reflects a broader clinical spectrum.

Central perforations were most common (45.0%), followed by paracentral (30.0%) and peripheral (25.0%) locations. Central involvement has important prognostic implications due to its direct effect on the visual axis and higher likelihood of residual visual impairment. Similar observations have been emphasized by Rashmi Deshmukh *et al.*[13] and Kate *et al.*[14], who highlighted the role of location in determining management and outcomes. Khalifa *et al.*[16] further demonstrated that even small localized perforations may require complex repair depending on site characteristics.

With respect to morphology, round perforations predominated (45.0%), followed by irregular and oval configurations. Although direct comparative data are limited, Rana and Savant[17] emphasized that perforation configuration significantly influences adhesive application and wound stability. Khalifa *et al.*[16] also demonstrated that irregular tissue loss may necessitate modified repair techniques, underscoring the clinical relevance of perforation shape.

The majority of perforations were small (<3 mm; 60.0%), which explains the predominant use of tissue adhesive with bandage contact lens (TABCL). This finding is consistent with literature recommending adhesive-based management for small defects, while larger perforations require surgical intervention such as keratoplasty.[13,14,16] Experimental work by Jingjing You *et al.*[18] further supports the effectiveness of adhesive techniques in small perforations. All cases in the present study were full-thickness, indicating advanced disease and necessitating active intervention, consistent with observations by Khalifa *et al.*[16] and Rashmi Deshmukh *et al.*[13]

A shallow anterior chamber was observed in 90.0% of cases, reflecting significant compromise of globe integrity. Similar findings have been indirectly supported by Masuda *et al*[12], who noted restoration of anterior chamber depth following successful management. Rana and Savant[17] also emphasized the importance of achieving watertight closure to restore anterior segment stability.

Management was tailored according to perforation characteristics, with TABCL being the most common modality (50.0%), followed by keratoplasty (25.0%) and Tenon's patch graft (18.3%). This approach aligns with established size and location-based treatment algorithms described by Rashmi Deshmukh *et al.*[13] and Kate *et al.*[14]

Anatomical outcomes were favorable, with 100% restoration of globe integrity and 92.0% epithelial healing. These findings are comparable to previous reports emphasizing the effectiveness of timely tectonic intervention.[16,17] However, corneal vascularization or haze occurred in 10.0% of cases, consistent with observations by Eri Onuma *et al.*[19] and Sharma *et al.*[20], who noted that although adhesives reduce inflammation, residual healing sequelae may occur.

A statistically significant association was found between perforation location and visual outcome ($p = 0.0421$), with central perforations showing the poorest visual improvement. This finding is consistent with the observations of Rashmi Deshmukh *et al.*[13] and Kate *et al.*[14], who emphasized the prognostic importance of lesion location. In contrast, although smaller perforations showed better visual improvement, the association with size did not reach statistical significance ($p = 0.0928$). Nevertheless, the observed trend is consistent with literature suggesting improved outcomes in smaller lesions.[16,18]

Post-procedural complications were low (10.0%), indicating that the management strategies were safe and effective. Similar advantages of adhesive-based techniques in reducing inflammation and complications have been reported by Eri Onuma *et al.*[19] and Sharma *et al.*[20] Jingjing You *et al.*[56] further demonstrated reduced pain and absence of secondary complications with bio-adhesives. However, as noted by Rashmi Deshmukh *et al.*[13] and Kate *et al.*[14], long-term follow-up remains essential to detect delayed complications.

The study population was systemically stable, with normal mean pulse and respiratory rates, indicating that corneal perforation is primarily a localized ophthalmic emergency. This observation is consistent with the perspective of Rashmi Deshmukh *et al.*[13] and Kate *et al.*[14], who emphasized that management decisions are primarily guided by local ocular factors.

Anterior segment findings revealed significant ocular surface inflammation and adnexal abnormalities, including conjunctival congestion, lid edema, and ectropion. These findings highlight the importance of comprehensive ocular surface management, as emphasized by Kate *et al.*[14] since such abnormalities can adversely affect healing and visual outcomes.

Strengths and Limitations

A key strength of the present study is its comprehensive, real-world evaluation of corneal perforation in a tertiary care setting, encompassing a broad spectrum of demographic, clinical, morphological, management, and outcome variables across 60 clinically confirmed cases. The inclusion of only full-thickness perforations ensured a focused assessment of clinically significant disease, while the use of multiple management modalities (TABCL, Tenon's patch graft, amniotic membrane graft, and keratoplasty) reflects practical treatment applicability. The study further adds value by correlating clinical parameters with functional outcomes, including the statistically significant association between perforation location and visual improvement, and by demonstrating excellent anatomical success with restoration of globe integrity in all cases. However, certain limitations should be acknowledged. The relatively small sample size and single-center design may limit generalizability and reduce statistical power for subgroup analyses. The exclusive inclusion of full-thickness perforations restricts comparison with earlier disease stages. Additionally, the study lacks long-term follow-up data, detailed etiological subclassification, and procedure-specific outcome stratification. Visual outcomes were also assessed in a simplified manner, which may not fully capture functional recovery. Despite these limitations, the study provides meaningful institution-based evidence relevant to clinical practice.

CONCLUSION

Corneal perforation is a vision-threatening ophthalmic emergency that predominantly affects middle-aged and elderly individuals and is most commonly associated with infective etiology. The present study demonstrates that timely, individualized management based on perforation size, location, and underlying cause can achieve excellent anatomical outcomes, with complete restoration of globe integrity in all cases. Adhesive-based techniques were effective for smaller lesions, while larger or complex perforations required surgical intervention. Visual prognosis was significantly influenced by perforation location, with central lesions showing poorer outcomes, while smaller perforations demonstrated relatively better visual recovery. Despite high anatomical success, functional outcomes remained variable, underscoring the importance of early diagnosis, prompt intervention, and comprehensive postoperative care to optimize both structural and visual results.

REFERENCES

1. Deshmukh, Rashmi et al. "Management of corneal perforations: An update." Indian journal of ophthalmology vol. 68,1 (2020): 7-14.

doi:10.4103/ijo.IJO_1151_19

2. Stamate, Alina-Cristina et al. "Emergency penetrating keratoplasty in corneal perforations." Romanian journal of ophthalmology vol. 62,4 (2018): 253-259.
3. Castano G, Elnahry AG, Mada PK. Fungal Keratitis.[Updated 2024 Feb 12]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK493192/
4. Ting, Darren Shu Jeng et al. "Infectious keratitis: an update on epidemiology, causative microorganisms, risk factors, and antimicrobial resistance." Eye (London, England) vol. 35,4 (2021): 1084-1101. doi:10.1038/s41433-020-01339-3
5. Gour, Abha et al. "A Case-Based Approach to the Management of Corneal Melts and Perforations in Ocular Surface Disorders." Cureus vol. 17,3 e81293. 27 Mar. 2025, doi:10.7759/cureus.81293
6. Jhanji, Vishal et al. "Management of corneal perforation." Survey of ophthalmology vol. 56,6 (2011): 522-38. doi:10.1016/j.survophthal.2011.06.003
7. Korah, Sanita et al. "Tenons Patch Graft in the Management of Large Corneal Perforations." Cornea vol. 35,5 (2016): 696-9. doi:10.1097/ICO.0000000000000808
8. Shekhawat, Nakul Singh et al. "Tenon Patch Graft with Vascularized Conjunctival Flap for Management of Corneal Perforation." Cornea vol. 41,11 (2022): 1465-1470. doi:10.1097/ICO.0000000000003068
9. Gurnani B, Kaur K. Penetrating Keratoplasty. [Updated 2023 Jun 11]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK592388/
10. Gupta, Noopur et al. "Burden of corneal blindness in India." Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine vol. 38,4 (2013): 198-206. doi:10.4103/0970-0218.120153
11. Asai T, Nakagami T, Mochizuki M, Hata N, Tsuchiya T, Hotta Y. Three cases of corneal melting after instillation of a new nonsteroidal anti-inflammatory drug. Cornea. 2006 Feb;25(2):224-7. doi: 10.1097/01.ico.0000177835.93130.d4. PMID: 16371788.
12. Masuda I, Matsuo T, Okamoto K, Matsushita K, Ohtsuki H. Two cases of corneal perforation after oral administration of nonsteroidal anti-inflammatory drugs: oral NSAID-induced corneal damage. Eur J Ophthalmol. 2010 Mar-Apr;20(2):454-6. doi: 10.1177/112067211002000230. PMID: 20037896.
13. Deshmukh R, Stevenson LJ, Vajpayee R. Management of corneal perforations: An update. Indian J Ophthalmol. 2020 Jan;68(1):7-14. doi: 10.4103/ijo.IJO_1151_19. PMID: 31856457; PMCID: PMC6951192.
14. Kate A, Deshmukh R, Donthineni PR, Sharma N, Vajpayee RB, Basu S. Management of corneal perforations in dry eye disease: Preferred practice pattern guidelines. Indian J Ophthalmol. 2023 Apr;71(4):1373-1381. doi: 10.4103/IJO.IJO_2826_22. PMID: 37026269; PMCID: PMC10276684.
15. Aljehani R, Almutlaq M, Aldossari S, Al-Abduljabbar K. Corneal Melt and Perforation Associated with Prolonged Oral Non-Steroidal Anti-Inflammatory Drug (NSAID) Use: A Case Report. Cureus. 2024 May 22;16(5):e60853. doi: 10.7759/cureus.60853. PMID: 38910677; PMCID: PMC11192065.
16. Khalifa YM, Bailony MR, Bloomer MM, Killingsworth D, Jeng BH. Management of nontraumatic corneal perforation with tectonic drape patch and cyanoacrylate glue. Cornea. 2010 Oct;29(10):1173-5. doi: 10.1097/ICO.0b013e3181d5d996. PMID: 20622669.
17. Rana M, Savant V. A brief review of techniques used to seal corneal perforation using cyanoacrylate tissue adhesive. Cont Lens Anterior Eye. 2013 Aug;36(4):156-8. doi: 10.1016/j.clae.2013.03.006. Epub 2013 Apr 24. PMID: 23623338.
18. You J, Frazer H, Sayyar S, Chen Z, Liu X, Taylor A, Filippi B, Beirne S, Wise I, Petsoglou C, Hodge C, Wallace G, Sutton G. Development of an in Situ Printing System With Human Platelet Lysate-Based Bio-Adhesive to Treat Corneal Perforations. Transl Vis Sci Technol. 2022 Jun 1;11(6):26. doi: 10.1167/tvst.11.6.26. PMID: 35767274; PMCID: PMC9251791.
19. Onuma E, Mukai K, Terada O, Chiban K, Ishii Y, Senoo T.[Application of biological adhesives for corneal perforation treatment]. Nippon Ganka Gakkai Zasshi. 2012 May;116(5):467-75. Japanese. PMID: 22690537.

20. Sharma A, Sharma N, Basu S, Sharma R, Aggarwal S, Gupta PC, Ram J, Nirankari VS. Tissue Adhesives for the Management of Corneal Perforations and Challenging Corneal Conditions. Clin Ophthalmol. 2023 Jan 15;17:209-223. doi: 10.2147/OPTH.S394454. PMID: 36685088; PMCID: PMC9851054.