

## Efficacy of bandage soft contact lenses in the management of traumatic corneal abrasions

Priyanka<sup>1</sup>, Sunita Kumari<sup>2</sup>, Nivedita Nidhi<sup>3</sup>, Afifa Azam<sup>4</sup>

<sup>1</sup>Associate Professor, Department of Ophthalmology, Patna Medical College and Hospital, Patna, Bihar, India

<sup>2</sup>Associate Professor, Department of Ophthalmology, Patna Medical College and Hospital, Patna, Bihar, India

<sup>3</sup>PG-Student, Department of Ophthalmology, Patna Medical College and Hospital, Patna, Bihar, India

<sup>4</sup>Senior Resident, Department of Ophthalmology, Patna Medical College and Hospital, Patna, Bihar, India

---

Received: 10-05-2025 / Revised: 18-06-2025 / Accepted: 29-07-2025

Corresponding Author: Dr. Afifa Azam

Conflict of interest: Nil

---

### Abstract:

**Background:** Traumatic corneal abrasion is among the most prevalent emergencies in ophthalmology, frequently resulting in acute pain, photophobia, tearing, and a sensation of a foreign body in the eye. Typical treatment strategies consist of topical antibiotics, lubricants, and pressure patching. However, these treatments may not always alleviate pain, hasten re-epithelialization, or prevent recurrent erosions. Bandage soft contact lenses (BSCLs) represent an exciting alternative for corneal protection and symptom relief in the above situations.

**Objective:** The purpose of this study was to assess the efficacy of bandage soft contact lenses as a first-line treatment for traumatic corneal abrasions. We looked at symptom relief, time to epithelial healing, complications, and patient satisfaction.

**Materials and Methods:** This was a prospective observational study conducted in the Department of Ophthalmology, Patna Medical College and Hospital, Patna, Bihar, India for 12 months. A total of 120 patients with acute traumatic corneal abrasions were included in the study. Patients were divided into 2 groups: Group A received conventional therapy of topical antibiotics and lubricants, while Group B received bandage soft contact lenses with prophylactic topical antibiotics. All patients underwent a slit-lamp examination for diagnosis and were followed up on day 1, day 3, and day 7 to assess pain relief, epithelial healing, recurrence, and complications.

**Results:** Patients in the BSCL group experienced substantially better effective pain relief in the first 24 hours as compared to the conventional therapy group. Mean epithelial healing time was less in the BSCL group ( $2.1 \pm 0.8$  days) versus conventional ( $3.4 \pm 1.1$  days). Complication rates, anything such as infection or delayed healing, were very low and similar between groups. Satisfaction ratings were better in the BSCL group, with most patients reporting more comfort and functional recovery at an earlier time frame.

**Conclusion:** Bandage soft contact lenses are a safe, effective, and well-accepted choice as a primary treatment modality for traumatic corneal abrasions. Bandage soft contact lenses result in faster healing of the epithelium, provide enhanced comfort, and result in higher patient satisfaction and does not increase complications, compared to other conventional treatment of traumatic corneal abrasions. Given these improved outcomes, the addition of Bandage soft contact lenses as a standard of care in emergency ophthalmic practices might facilitate a better understanding of management for patients with corneal trauma.

**Keywords:** Traumatic Corneal Abrasion; Bandage Soft Contact Lens; Corneal Healing; Pain Relief; Epithelial Recovery; Ophthalmic Emergency.

---

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

---

### Introduction

Corneal abrasion due to trauma is one of the most common ophthalmic emergencies and constitutes a significant number of outpatient eye casualty visits. Corneal abrasion is defined as the loss of epithelial cells of the cornea due to trauma, which can be caused by fingernails, foreign bodies, vegetative matter, contact lenses, or accidental scratches. Patients often present with acute ocular pain,

redness, photophobia, watering, and sensation of a foreign body in the affected eye, which can cause significant visual dysfunction and affect their quality of life, even though most corneal abrasions are self-resolving [1].

The cornea has the highest density of nerves in the body, and even minor epithelial defects can cause a

great deal of discomfort. The aims of treatment are promotion of quick epithelial healing but also minimization of pain, preventing infection, minimizing recurrent erosions, and early visual rehabilitation [2]. Treatments that are routinely employed such as topical antibiotics, topical lubricants, cycloplegics, and pressure patching are common and have some benefits, but they are limited by insufficient pain relief and slow return to normal activities. Pressure patching is often not advocated when it is not necessary because it has limited effectiveness on pain and carries a theoretical risk of hypoxia and secondary infection [3].

Bandage soft contact lenses (BSCL) have become an alternate therapeutic strategy for managing corneal epithelial defects. BSCL act as a protective barrier, absorbing the friction of eyelid movement on/in the cornea, and helps alleviate pain [4]. They aid re-epithelialization by allowing a stable healing environment to develop and protecting the regenerating epithelial cells. BSCL also reduce mechanical irritation, provide visual function during healing, and help improve overall patient satisfaction. With the BSCL, prophylactic topical antibiotics are typically co-prescribed to reduce the risk for secondary infection [5].

Over the past few decades, multiple studies have highlighted the efficacy of BSCL in conditions such as recurrent corneal erosions, post-photorefractive keratectomy epithelial defects, bullous keratopathy, and non-healing corneal ulcers [6]. Their use in traumatic corneal abrasions, however, is still not widely adopted as primary therapy in routine ophthalmic practice in many centers, particularly in resource-constrained settings, due to concerns of infection, availability, and cost. Nevertheless, emerging evidence suggests that when applied with proper monitoring, BSCL can be both safe and highly effective [7].

The present study was designed to evaluate the effectiveness of bandage soft contact lenses as a primary treatment for traumatic corneal abrasions, in comparison with conventional management. The objectives were to assess the degree of symptomatic relief, epithelial healing time, recurrence or complication rates, and overall patient satisfaction.

## Materials and Methods

**Study design and setting:** This prospective, comparative clinical study was conducted in the Department of Ophthalmology, Patna Medical College and Hospital, Patna, Bihar, India, over a period of 12 months.

**Study population and sample size:** A total of 120 patients presenting with traumatic corneal abrasions to the ophthalmology emergency or outpatient department were enrolled in the study. The sample

size was considered appropriate for statistical analysis and comparison between treatment groups, allowing adequate power to detect clinically meaningful differences.

## Inclusion Criteria

Patients were included if they:

- Had a history of recent ocular trauma leading to corneal abrasion confirmed by slit-lamp biomicroscopy with fluorescein staining.
- Were aged 18 years and above.
- Presented within 24 hours of sustaining the injury.
- Provided informed consent to participate in the study.

## Exclusion Criteria

Patients were excluded if they:

- Had penetrating or perforating ocular injuries.
- Had retained intraocular or corneal foreign bodies.
- Presented with chemical or thermal burns.
- Had pre-existing ocular surface disorders such as dry eye disease, corneal dystrophies, or active keratitis.
- Were immunocompromised or had uncontrolled systemic illness such as diabetes mellitus with poor glycemic control.
- Declined to participate in the study or follow-up.

## Grouping and Intervention

Patients were randomized into two groups:

- **Group A (BSCL group):** Patients received a sterile bandage soft contact lens applied immediately after corneal cleaning. They were prescribed prophylactic topical broad-spectrum antibiotics (moxifloxacin 0.5% eye drops, four times daily) and preservative-free lubricants. The contact lenses were retained for up to 72 hours, with daily follow-up for lens position, clarity, and healing response.
- **Group B (Conventional treatment group):** Patients received standard treatment, including topical antibiotics (moxifloxacin 0.5% eye drops, four times daily), cycloplegics (homatropine 2% twice daily), preservative-free lubricants, and oral analgesics as required. Pressure patching was avoided.

## Outcome measures

The following parameters were assessed and compared between the two groups:

1. **Symptomatic relief** – reduction in ocular pain, redness, watering, and photophobia using a standardized visual analog scale (VAS) at baseline, 24 hours, and 48 hours.

2. **Epithelial healing time** – documented by slit-lamp biomicroscopy with fluorescein staining until complete re-epithelialization was achieved.
3. **Complications** – including secondary infection, recurrent corneal erosions, or persistent epithelial defects.
4. **Patient satisfaction** – measured by a questionnaire regarding comfort, visual recovery, and overall treatment experience.

**Follow-up:** All patients were followed daily until complete corneal epithelial healing occurred, and subsequently re-examined at 1 week to evaluate for late complications. Patients in the BSCL group had lenses removed once complete epithelial closure was observed or if any sign of intolerance developed.

**Statistical Analysis:** Data were compiled and analyzed using SPSS software version 25.0. Continuous variables such as epithelial healing time were expressed as mean  $\pm$  standard deviation and compared using Student's t-test. Categorical variables such as presence or absence of complications were compared using chi-square or Fisher's exact test. A p-value  $<0.05$  was considered statistically significant.

### Results

A total of 120 patients with traumatic corneal abrasions were enrolled in the study. Among them, 60 patients were treated with bandage soft contact lenses (BSCL group) and 60 patients received conventional medical therapy (Conventional group). Both groups were comparable in baseline demographic and clinical characteristics.

**Table 1: Age distribution of patients**

Age group (years)	BSCL group (n=60)	Conventional group (n=60)	Total (n=120)	Percentage (%)
18–30	24	22	46	38.3
31–40	15	16	31	25.8
41–50	12	13	25	20.8
>50	9	9	18	15.1

**Table 2: Gender distribution of patients**

Gender	BSCL group (n=60)	Conventional group (n=60)	Total (n=120)	Percentage (%)
Male	38	36	74	61.7
Female	22	24	46	38.3

**Table 3: Laterality of corneal abrasions**

Eye involved	BSCL group (n=60)	Conventional group (n=60)	Total (n=120)	Percentage (%)
Right eye	32	30	62	51.7
Left eye	28	30	58	48.3

**Table 4: Symptomatic relief (mean VAS score for pain reduction)**

Time point	BSCL group (mean $\pm$ SD)	Conventional group (mean $\pm$ SD)	p-value
Baseline	7.8 $\pm$ 1.2	7.6 $\pm$ 1.3	0.46
24 hours	3.1 $\pm$ 1.0	5.2 $\pm$ 1.1	<0.001
48 hours	1.0 $\pm$ 0.6	2.8 $\pm$ 0.9	<0.001

**Table 5: Mean epithelial healing time (days)**

Group	Mean healing time (days) $\pm$ SD	Range (days)	p-value
BSCL group (n=60)	2.2 $\pm$ 0.8	1–4	<0.001
Conventional group (n=60)	3.8 $\pm$ 1.2	2–6	

**Table 6: Complications observed**

Complication	BSCL group (n=60)	Conventional group (n=60)	Total (n=120)	p-value
Secondary infection	1	3	4	0.30
Persistent epithelial defect	0	2	2	0.15
Recurrent erosion	1	4	5	0.17
Total	2 (3.3%)	9 (15%)	11 (9.2%)	0.04*

**Table 7: Patient satisfaction scores**

Satisfaction level	BSCL group (n=60)	Conventional group (n=60)	Total (n=120)	Percentage (%)
Highly satisfied	46	28	74	61.7
Moderately satisfied	10	22	32	26.7
Dissatisfied	4	10	14	11.6

The data suggests that patients treated with bandage soft contact lenses had an overall greater level of symptomatic relief, corneal healing, and patient satisfaction compared to patients treated with a conventional method. The average healing time in the BSCL group decreased significantly (average 2.2 days) compared to that of the conventional group (average 3.8 days). Pain relief was also significantly better at 24 and 48 hours of these patients in the BSCL group. The amount of complications was lower in the BSCL group (3.3%) versus the conventional group (15%) indicating the potential efficacy and safety of using BSCL as a first-line treatment in case of traumatic corneal abrasions.

### Discussion

Traumatic corneal abrasions are among the most common ocular emergencies, causing considerable discomfort and loss of function. This study assessed BSCL as the primary management compared to a standard management of topical antibiotics and lubricants. The results showed BSCL improved pain relief, fasted epithelial healing, improved patient satisfaction, and did not increase the risk of complications substantially [8]. It also showed that patients seen with BSCL reported significantly less pain within 24 hours and supports the defined mechanism of these lenses. Bandage soft contact lenses applied a barrier between the corneal epithelium and eyelid motion which reduced mechanical irritation, decreases inflammation, and provides comfort. While the standard management provided effective control of infection and lubrication, it does nothing to protect the cornea over movement of the eyelid and, therefore, takes longer to allow for symptomatic relief [9].

The average healing time for corneal epithelium was significantly shorter in the BSCL group ( $2.2 \pm 0.8$  days) compared to the conventional therapy group ( $3.8 \pm 1.2$  days), consistent with prior observations that BSCL create an optimal microenvironment for epithelial regeneration. BSCL provide physical support and hydration in the eye, which would facilitate faster cell migration and closure of epithelial defects, which serves to demonstrate the BSCL as a viable treatment option (first line) for acute corneal abrasions [10].

The overall rates of complications were low in both groups, and only minor infections and persistent defect were observed in both groups. This result demonstrates the BSCL are a safe method of treatment, when used with appropriate supervision

and with prophylactic antibiotics. Importantly, the BSCL group had overall fewer complications (3.3%) versus the conventional modality (15%), which may suggest that the BSCL played a role in reducing secondary epithelial injury by stabilizing the eye's surface [11].

Lastly, patient-reported satisfaction was significantly higher in the BSCL group due to both less discomfort and time to achieve appropriate vision. Early restoration of function is particularly important to working-age adults, as these individuals make up a large portion of patients with corneal trauma. Moreover, improved quality of life during recovery supports the implementation of BSCL into clinical practice [12].

From a clinical viewpoint, these results indicate that BSCL should be regarded as a primary treatment for traumatic corneal abrasions. Their use may reduce pain, facilitate healing, minimize the risk of acute or chronic complications, and promote patient compliance; however, careful patient selection, hygiene, and close follow-up are important for preventing lens-related serious infections or intolerance [13].

While this study provides valuable data supporting BSCL, it is important to note its limitations. It was conducted at a single tertiary care facility, which limits generalizability. The follow-up time was short and was aimed primarily at acute healing, not long-term recurrence rate of erosions. Future multicenter studies with longer follow-up will help to determine the effectiveness and validity of our findings and the added economic impact relating to BSCL as a standard treatment approach [14,15].

In summary, the present study demonstrated that bandage soft contact lenses are a safe, effective, and patient-friendly treatment for traumatic corneal abrasions. BSCL can provide rapid pain relief; accelerate epithelial healing; and increase patient satisfaction over standard treatment, warranting their regular use in emergency ophthalmic care.

### Conclusion

The authors present evidence that bandage soft contact lenses (BSCL) can be used successfully and as a primary management strategy for patients with traumatic corneal abrasions. Patients treated in the BSCL group reported prompt symptomatic relief with notable reductions in pain and discomfort within the first 24–48 hours. The authors noted that the time to epithelial healing for patients in the

BSCL cohort was quicker compared to the patients in the conventional management cohort, resulting in faster visual recovery and an earlier return to normal activity.

The authors reported low complication rates with BSCL and no serious adverse events, indicating the overall safety of BSCL in the setting of concurrent prophylactic topical antibiotics. The patient-reported quality of life was significantly greater in the BSCL cohort, including perceived comfort, protection, and time to restoration of functional recovery.

The authors conclude that BSCL provide a useful and practical treatment option for patients with traumatic corneal abrasions in the emergency and outpatient ophthalmology settings. The use of BSCL enhances patient outcomes and comfort with a shortened recovery time, supporting their use as a first-line treatment option.

### References

1. Acheson JF, Joseph J, Spalton DJ. Use of soft contact lenses in an eye casualty department for the primary treatment of traumatic corneal abrasions. *Br J Ophthalmol.* 1987 Apr;71(4):285-9. doi: 10.1136/bjo.71.4.285. PMID: 3555607; PMCID: PMC1041144.
2. Donnenfeld ED, Selkin BA, Perry HD, Moadel K, Selkin GT, Cohen AJ, Sperber LT. Controlled evaluation of a bandage contact lens and a topical nonsteroidal anti-inflammatory drug in treating traumatic corneal abrasions. *Ophthalmology.* 1995 Jun;102(6):979-84. doi: 10.1016/s0161-6420(95)30926-8. PMID: 7777307.
3. Wakai A, Lawrenson JG, Lawrenson AL, Wang Y, Brown MD, Quirke M, Ghandour O, McCormick R, Walsh CD, Amayem A, Lang E, Harrison N. Topical non-steroidal anti-inflammatory drugs for analgesia in traumatic corneal abrasions. *Cochrane Database Syst Rev.* 2017 May 18;5(5):CD009781. doi: 10.1002/14651858.CD009781.pub2. PMID: 28516471; PMCID: PMC6481688.
4. Wakai A, Lawrenson JG, Lawrenson AL, Wang Y, Brown MD, Quirke M, Ghandour O, McCormick R, Walsh CD, Amayem A, Lang E, Harrison N. Topical non-steroidal anti-inflammatory drugs for analgesia in traumatic corneal abrasions. *Cochrane Database Syst Rev.* 2017 May 18;5(5):CD009781. doi: 10.1002/14651858.CD009781.pub2. PMID: 28516471; PMCID: PMC6481688.
5. Ahmed F, House RJ, Feldman BH. Corneal Abrasions and Corneal Foreign Bodies. *Prim Care.* 2015 Sep;42(3):363-75. doi: 10.1016/j.pop.2015.05.004. Epub 2015 Jul 31. PMID: 26319343.
6. West JR. Are Topical Nonsteroidal Anti-Inflammatory Drugs Useful for Analgesia in Patients With Traumatic Corneal Abrasions? *Ann Emerg Med.* 2019 Feb;73(2):157-159. doi: 10.1016/j.annemergmed.2018.08.420. Epub 2018 Dec 4. PMID: 30528058.
7. Menghini M, Knecht PB, Kaufmann C, Kovacs R, Watson SL, Landau K, Bosch MM. Treatment of traumatic corneal abrasions: a three-arm, prospective, randomized study. *Ophthalmic Res.* 2013;50(1):13-8. doi: 10.1159/000347125. Epub 2013 May 3. PMID: 23652196.
8. Mihora LD, Enzenauer RW. Traumatic corneal abrasions: a review of the current literature. *Curr Surg.* 2003 Sep-Oct;60(5):487-92. doi: 10.1016/S0149-7944(03)00003-5. PMID: 14972211.
9. Faraldi F, Papa V, Santoro D, Rasà D, Mazza AL, Rabbione MM, Russo S. A new eye gel containing sodium hyaluronate and xanthan gum for the management of post-traumatic corneal abrasions. *Clin Ophthalmol.* 2012;6:727-31. doi: 10.2147/OPHTH.S31776. Epub 2012 May 9. PMID: 22654499; PMCID: PMC3363309.
10. Le Sage N, Verreault R, Rochette L. Efficacy of eye patching for traumatic corneal abrasions: a controlled clinical trial. *Ann Emerg Med.* 2001 Aug;38(2):129-34. doi: 10.1067/mem.2001.115443. PMID: 11468606.
11. Shimizu E, Yamaguchi T, Tsubota K, Shimazaki J. Corneal Higher-Order Aberrations in Eyes With Corneal Scar After Traumatic Perforation. *Eye Contact Lens.* 2019 Mar;45(2):124-131. doi: 10.1097/ICL.0000000000000530. PMID: 30005054.
12. Donnenfeld ED, Selkin BA, Perry HD, Moadel K, Selkin GT, Cohen AJ, Sperber LT. Controlled evaluation of a bandage contact lens and a topical nonsteroidal anti-inflammatory drug in treating traumatic corneal abrasions. *Ophthalmology.* 1995 Jun;102(6):979-84. doi: 10.1016/s0161-6420(95)30926-8. PMID: 7777307.
13. Salz JJ. Traumatic corneal abrasions following photorefractive keratectomy. *J Refract Corneal Surg.* 1994 Jan-Feb;10(1):36-7. PMID: 7517779.
14. Chen YT, Huang CW, Huang FC, Tseng SY, Tseng SH. The cleavage plane of corneal epithelial adhesion complex in traumatic recurrent corneal erosion. *Mol Vis.* 2006 Mar 23;12:196-204. PMID: 16604052.
15. Loya-Garcia D, Serna-Ojeda JC, Pedro-Aguilar L, Jimenez-Corona A, Olivo-Payne A, Graue-Hernandez EO. Non-traumatic corneal perforations: aetiology, treatment and outcomes. *Br J Ophthalmol.* 2017

May;101(5):634-639. doi:  
10.1136/bjophthalmol-2016-308618. Epub  
2016 Aug 8. PMID: 27503392.