

Research Article

The evaluation of bandage soft contact lenses as a primary treatment for traumatic corneal abrasions

Hashim Thiab Hassan*

Department of Ophthalmology, Alyarmouk Teaching Hospital, Baghdad, Iraq

More Information

*Address for Correspondence: Dr. Hashim Thiab Hassan FIBOphth, MRCOphth, London, Department of Ophthalmology, Alyarmouk Teaching Hospital, Baghdad, Iraq, Email: drhthophth@gmail.com

Submitted: 24 April 2020

Approved: 22 May 2020

Published: 25 May 2020

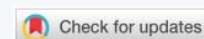
How to cite this article: Hassan HT. The evaluation of bandage soft contact lenses as a primary treatment for traumatic corneal abrasions. Int J Clin Exp Ophthalmol. 2020; 4: 041-048.

DOI: 10.29328/journal.ijceo.1001032

ORCID: orcid.org/0000-0003-1116-9250

Copyright: © 2020 Hassan HT. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Keywords: TCA: Traumatic corneal abrasion; BSCL: Bandage Soft contact Lens; RCE: Recurrent Corneal Erosion; VA: Visual Acuity; PF: Preservative Free; ED: Eye Drop; PP: Pressure Patch



Abstract

Background: Corneal abrasions are a common result of eye trauma. Corneal injuries are very common in both the adult and pediatric population and account for a significant proportion of the workload of most emergency departments. Although abrasion heals well with preservative treatment, it still causes pain and job lost. The abrasion result from the scrubble of the corneal epithelium. These injuries cause pain, tearing, lids spasm, light scare, foreign body sensation, decreased visual acuity/blurring, and a gritty feeling. The light, friction & wink was worse the condition. Most abrasion cure within 24-27 hours and seldom proceed to erosion or infection. The study aims to use bandage soft contact lens (BSCL) as a primary treatment for traumatic corneal abrasion [TCA] instead of traditionally use pressure patch (PP).

Patients and methods: The present prospective study has been conducted on 50 patients attending the out-patient department of ophthalmology in an Alyarmouk teaching hospital for six months after taking ethical permission. Before subjecting the patient to the treatment of bandage soft contact lens therapy, a detailed clinical history and thorough local examination have been done. A history indicating the occurrence of recent ocular trauma followed by severe pain, redness, lids spasm, photophobia, and tearing of the involved eye is suggestive of a corneal abrasion. Always we ask about contact lens wear as this can complicate the presence of an abrasion. To confirm the diagnosis of traumatic corneal abrasion we examine the cornea by slit-lamp under cobalt-blue filtered light after the application of tetracaine eye drops & fluorescein strips. The treatment of 50 consecutive patients presenting with traumatic corneal abrasion has been treated with anesthetic eye drop (tetracaine 0.5%) to relieve pain and lids spasm, antibiotic eye drop (ofloxacin 0.3%), therapeutic bandage soft contact lens was applied to provide pain relief and once again act as a splint to promote epithelial healing, then visual acuity was measured by Snellen chart, a cycloplegic eye drop (cyclopentolate 1%) was applied to relieve ciliary spasm & then preservative-free lubricant eye drop were applied lastly. This criterion dramatically relieves most, if not all of the pain the patient may be experiencing (which is a big plus for the patient and earns instantaneous trust), but it also allows the patient to return to work/school or any other daily activities. Patients have been evaluated after 24 hours, 72hours and after 1week regarding pain, visual acuity, and complications. Though pressure patch [PP] occasionally advice in abrasion therapy, it does not assist and may prevent recovery. Employ the protective eyewear can preclude the traumatic corneal abrasion.

Results: A total of 50 cases were enrolled in our study during the study period of 6 months. Out of 50 patients, there were 30 males and 20 females and the male/female ratio was 3:2. The patient's age was ranged from 5-35 years. The commonest cause of injury was direct minor trauma (80% of cases), with cosmetic & optical contact lenses related problems accounting for 20% of presentations, visual acuity was documented correctly in 90% of adult and pediatric group and difficult to documented in children less than 6-year-old 10%. Traumatic corneal abrasion treated with bandage soft contact lens has an apparent advantage over the traditional pressure patch in terms of reduced pain, speedier healing, and an advantage of faster rehabilitation, facilitation epithelial healing, and proper surface hydration. Evaluation of pain revealed sufficient comfort with this regimen, allowing 45 patients (90%) to go back immediately to their occupations. Moreover, visual function is retained without any complication. Healing of the traumatic corneal abrasion occurred within 1 to 3 days in all patients, with minimal or no pain. The infection did not occur at the time of the follow up. We remove the bandage soft contact lens after 1 week to allow epithelial migration and attachment without the interference of the shearing forces of the upper lid.

Conclusion: The use of bandage soft contact lens as a primary treatment for a traumatic corneal abrasion is a safe and effective method with anesthetic eye drop (tetracaine 0.5%), antibiotic eye drop (ofloxacin 0.3%), cycloplegic eye drop (cyclopentolate 1%), preservative-free lubricant drop instead of traditionally pressure patch. Bandage soft contact lens causes dramatic improvement from pain, lid spasm, tearing & visual function is retained without any complication, and patients can immediately resume their regular activities.

Introduction

The bony orbit defense most of the eyeball. The eyebrow & eyelash partly cover the eye from small chips [1]. Eyelids shut promptly and reactively when eye risk is felt. The cornea is usually protected by the eyelids yet is susceptible to injury, especially from trauma [1]. A tear response attempts to wash away anything that reaches the ocular surface. Tears also lubricate the eye and prevent tissue dryness [1]. The cornea is a highly organized group of cells and proteins, it is a transparent tissue over the anterior part of the eye that serves several purposes: protection, refraction (the cornea is responsible for 65 to 75 percent of the eye's capacity to focus light on the retina), and filtration of some ultraviolet light. The cornea empties from blood vessels and extrudes nutrients from tears, ambient oxygen & aqueous humor. Sensory innervation of the cornea from the ophthalmic branch of the trigeminal nerve. The vertical diameter of cornea about 11mm, the horizontal is about 12 mm & the central thickness is 0.5mm while at periphery about 1mm. The cornea arranged from 5 strata from outside to inside: epithelium, Bowman's stratum, stroma, Descemet membrane & endothelium [1]. Traumatic corneal abrasion [TCA] is a blemish in the epithelium and does not pierce the Bowman membrane [2]. When small TCA happens, sound cells soon seal the defect to prohibit vision hurt, infection, or unequal refraction. If TCA infiltrates cornea more profoundly, the recovery prolonged [3]. Profound slash can cause scarring which hurt vision to the degree corneal graft required. TCA is very common in both the adult and pediatric population and account for a significant proportion of the workload of most emergency cases. TCA produces considerable impairment & sick leave. The incidence of these often work-related eye injuries has been reported as high as 15 per 1,000 people per year of which 87% were TCAs [4]. Similarly, an audit performed in 2003 showed that TCAs due to external foreign bodies are among the most common conditions treated in an emergency eye department [5]. TCA in spite, not menacing hurt to the eye it can decrease the activity of patients due to pain & blurred vision [6]. TCA occur in any situation that causes epithelial compromise, and the common causes for that are the following:

1. Minor ocular trauma: it is usually unilateral, it occurs because of a disruption in the integrity of the corneal epithelium or because the corneal surface is scraped away or denuded as a result of physical external forces like (fingers & fingernails) especially in small children. They can mishap strike the eyes of parents who ever carrying them. Toys and fingernails are the leading causes of a scratched cornea in children, a punched in the eye during fight or sport, animal paws, pieces of paper or cardboard, makeup applicators like mascara brushes, ocular foreign bodies embedded under an eyelid may also cause a scratch if the eye is rubbed [7]. Hand tools, branches or leaves, automotive frontal airbags, thermal burns such as cigarette, rubbing the eyes vigorously especially if fell something is caught in the eye.

2. Contact lens wearers: It may be bilateral, by improperly fitted, extended contact lens wear, a contact lens may induce epithelial defects by direct trauma during lens insertion or removal [7]. Corneal abrasions due to soft contact lenses (optical & cosmetic) are observed most frequently with a tight or extended-wear lens. Severe epithelial hypoxia destroys the connection of the epithelium to the Bowman membrane. When contact lens takes off the lower part of cornea abraded. Sometimes the lens becomes dry at the terminus of the day due to lack of blinking. The lens clings to epithelium & removed it when taking off the lens. Also, edges of cracked contact lenses can scrub epithelium cause abrasion [2]. After the contact lens is taken away, the patient sense annoyance, but no trouble happens when the lens is worn due to contact lens work as a bandage. Imperfect blinking by a patient who jobs in dry ambient, mostly reading, watching TV or computer screens should be premonitory from this elaboration [2]. Nightly put on contact lens causes corneal tumescence. Through sleeping cornea bulge 2% - 4%, with a contact lens put on bulge increment to 15% [8]. TCA causes pain and difficulty to open eye due to gritty felling. The Severity range from mild to agonizing pain depending on the size of abrasion. Other symptoms implicate light scare, tearing & blurred vision. Congestion of conjunctiva & lid bulge sometimes occurs [2]. TCA is a source of acute pain because the corneal epithelium is profusely innervated by sensory pain fibers of trigeminal nerve [2].

Symptoms can be worsened by exposure to light, blinking, and rubbing the injured surface against the inside of the eyelid [9]. Peripheral TCA cure by slipping of limbal cells to coat the defect which moves slowly, which is the origin of new epithelial stem cells, while central TCA cure by the migration of cells from the basal layer of epithelium which move rapidly [10]. Cellular reproduction starts 24 hours after trauma [11]. Curing of TCA not integral before the recent epithelium establishes itself to underlying connective tissue. Epithelial cells dislodge promptly and promote potent, constant adhesion within 7 days when the basement membrane created & released through the cell migration [2]. For that cause, we remove the bandage soft contact lens [BSCL] after 1 week. TCA commonly cure without significant consequences. While the profound corneal injury may cause scar inside the stroma. Diagnosis of TCA by observing the cornea through slit-lamp after use of tetracaine 0.5% eye drop & fluorescein strip, this causes abrasion to appear green in color. TCA related to contact lens wear report to be dotted, huge & a circle form. Light scare cause lid closure necessitates put a cycloplegic eye drop [ED] (cyclopentolate 1%). The vision should be estimated, if TCA affects the center of the cornea there may be a decrease in vision that should be matched to the sound eye. Most TCA cure within 1 to 3 days and seldom proceed to erosion or infection.

Traditionally the management of TCA consists of topical anesthetic, cycloplegic, antibiotic, artificial tears EDs & pressure patch [PP] [12]. Various studies display that PP does not assist and may prohibit recovery.



PP can lead to disadvantages such as loss of binocular vision, discomfort from the patch itself, and reduced corneal oxygenation [13]. The healing period may last for several days and is associated with continuing pain and further visual disability from the dressing [13]. Instead of that, TCA can be effectively handled with BSCL to outfit pain release & work as a splint to reinforce epithelial cure & to preserve the binocular seeing [14,15].

Contact lenses are most commonly worn as an alternative to spectacles in the correction of refractive errors. Therapeutic BSCL has a wide range of uses [16].

There have been many modifications in contact lenses from the first corneal plastic lens to the introduction of the present hydrogel lens by Wichterle and Linn 1960, its routine use for corneal disorders came into use. Due to the advent of contact lenses technology, new materials have been developed covering not only the correction of optical error but also a variety of therapeutic purposes [17], like use bandage contact lens after laser procedures on the surface of the cornea (like photorefractive keratectomy PRK).

Therapeutic BSCL may be fabricated from hydrogels, silicone, or collagen. Most lenses are hydrogels that consist of an acrylic polymer matrix capable of absorbing a substantial amount of water. These hydrophilic lenses are composed of up to 80% water depending on the type of lens and oxygen permeable. Initially, hydroxyethyl methacrylate (HEMA) was the hydrogel material used for therapeutic lenses [18].

More recently another polymer like poly HEMA, vinylpyrrolidone, glyceryl methacrylate, and diacetone acrylamide are being used. With the recent advances in material technology, today's BSCLs provide benefits with enhanced convenience, improved healing, and increased corneal health. BSCL has evolved as an adjuvant to medical treatment available so far for corneal disease [19].

This study was planned to evaluate the therapeutic efficacy of BSCLs in TCAs for providing and promoting relief of pain, epithelial healing, protection, improving visual acuity. BSCLs were first used in the 1970s following the development of HEMA by Otto Wichterle [17]. BSCL conserve the cornea due to their peak oxygen permeability & acceptance for prolonged wear. BSCL saves the cornea from the patient's lid. The clipping influence formed by the lids through blinking can decrease, enhancement of re-epithelization and give rise to pain-free feeling. The application of a therapeutic BSCL has been considered in various studies [12,20-24].

Achieving the goals of pain & photophobia reduction, facilitation epithelial healing, and proper surface hydration. Moreover, visual function is retained. Although the BSCL is also a patching method, its placement on the wounded cornea prevents direct contact of the erosion with the moving upper eyelid, so that healing is quicker and there is less pain [25].

Complication is the exclusion rather than a standard from mild TCA. Occasionally the healed epithelium may be poorly adherent to the underlying basement membrane in which case it may detach at intervals giving rise to recurrent corneal erosions[RCE] [26].

TCA can oftentimes be prohibited by employ defensive eyewear when proceeding jobs that place eyes at danger of trauma.

Patients and methods

The present prospective study was conducted on 50 patients with TCA attending the out-patient department of ophthalmology in an Alyarmouk teaching hospital for six months. Hydrophilic therapeutic BSCLs were used. Before subjecting the patient to therapeutic BSCL therapy, informed consent has been obtained, a detail clinical history and thorough local examination was done, all patients diagnosed and treated for a superficial TCA after fulfilling the following criteria: the abrasion was of a surface area of greater than 2 mm, the area of abrasion was measured by the slit-lamp gated beam, no limitation regarding age, the age range between 5 to 35 years, there was no evidence of secondary infection or retained foreign body or coincidental ocular disease, and no previous treatment had been given. The present study aimed to evaluate the therapeutic BSCL as a primary treatment for TCA. The disposable BSCL Bio54 tinted soft contact lenses (hioxifilcon D 46%, water 54%) in a buffered 0.9 normal saline, 14. 2 mm diameter were used, it too covers the whole cornea, sclera to sclera, and fits all eyes. BSCL provides various objects in the treatment of TCA. It is applied instead of PP for pain comfort, corneal preservation & drug transmission. The improvement in contact lens processing made the BSCL unharmed & suitable to use in an eye which is comparatively exposed to hazard by abrasion [27]. BSCL permit synchronous use of eye drops, expand the contact time of eye drops, attend as a block to moreover epithelial disturbance & nerve excitation by clipping power of the upper lid through blinking, let the ophthalmologist to monitor the eye without take off the dressing, permit the patient to have applicable seeing in the injured eye & display superior cosmetic with a capacity to put on sunglasses as required.

Diagnosing corneal abrasion

TCA indicated from a story of novel eye injury & following intense eye soreness. Symptoms comprise light scare, ache with eye activity, extreme tearing, lid cramp, sandy feeling, blurred seeing & occasionally lid puffiness.

Before the examination of the patient with a TCA, it is essential to install a topical anesthetic agent such as tetracaine 0.5% eye drop (ED) This not only helps the examiner to carry out a comprehensive assessment but also puts the patient at ease and alleviating pain. The examination should be carried out systematically, begin with an examination of the eyelids



and adnexa for signs of ocular inflammation and trauma, and evert the upper eyelid to check for the presence of a foreign body. The diagnosis of TCA can be proven by seeing the cornea by slit-lamp after put anesthetic ED & fluorescein strip, which will give rise to abrasion to manifest as green color [28]. Eye drops aim to decrease injury effect & prohibit complications. Small TCA can be managed on an outpatient basis. Ice compresses should be used for 24-48 hs to reduce edema. Antibiotic ED used to prevent infection, cycloplegic ED can reduce pain and photophobia & preservative free [PF] lubricant ED. All patients received tetracaine 0.5% ED before the examination, the onset of action is in 1 min, the anesthetic effect lasts up to 15-20 min., then applied fluorescein strip in lower cul de sac then examine the patients by slit lamp with blue cobalt light to confirm the diagnosis, after that we wash the fluorescein by PF lubricant EDs then the BSCL inserted, then measure visual acuity [VA] by Snellen chart, antibiotic ofloxacin ED & cyclopentolate 1% ED were administered. Tetracaine 0.5% ED should never be prescribed for patients to use for pain relief at home because they delay wound healing and increase the risk of corneal ulcer formation [28].

Ofloxacin ED is a broad-spectrum bactericidal effect, it used hourly on the first day then 1X4 for seven days, and PF lubricants hourly at first day then 1X4 for 1 week. Anticholinergic cyclopentolate 1% ED, it causes relaxation of the muscles of ciliary body & iris to decrease pain, it is used once daily for the first 3 days then stop it. It induces mydriasis in 30-60 min and cycloplegia in 25-75 min; effects last up to 24 hours, the rationale behind their use was that they relieved ciliary muscle spasm and therefore helped with the pain associated with TCA.

PP was not lead to recovery rates or decrease ache & likely to rise pain [28].

Furthermore, the review concluded that PP results in an acute loss of binocular vision, which impacts driving, work, and other day-to-day activities. Therefore, PP should be avoided for patients with simple TCA [29].

The patients were reviewed after 24 hours with much less pain, photophobia, redness, and blur. With the lens in place, VA was done. Slit-lamp examination revealed that the lens was well-centered with minimal lens movement.

Each case was assessed to determine the documentation of the following criteria:

1. Age.
2. (VA).
3. Lid examination.
4. Treatment.
5. Discharge plain.

According to the classification of the emergency department, 30 cases were adult patients (> 12 years of age) and 20 cases were pediatric (< 12 years of age). Patients demographics are shown in table 1.

The patients were reviewed after 24 hours and an assessment of their pain, photophobia, tearing & VA has done & slit-lamp examination done to assess the abrasion & BSCL, the abrasion appeared much improved, with a smaller epithelial defect and less edema, after 3 days and after 1 week see the patients with VA done and slit-lamp examination, and the abrasions considered healed when local punctate keratitis only could be observed on slit-lamp biomicroscopy of the injured site. We put the BSCL on the cornea for 7 days to permit epithelial movement & connection without the intervention of the clipping power of the upper lid. Those treated with a BSCL noted dramatic relief of pain and lid spasm with rapid comfort in the injured eye and he can open the sound eye more comfortably. BSCL elaborations are ideally either self-acting from the near conjunction between BSCL & eye exterior or inflammatory reaction from adhering wrack beneath the lens. Due to the BSCLs are applied on the disclosed eye surface, a prudent proceeding is demanding. We examine the patient after 24 hours & then after 72 hours when cyclopentolate 1% ED withdrawal. Recommend the patient to preclude light, or to wear sunglasses. The main outcome measures were subjective symptoms that were monitored (VA, pain, photophobia & foreign body sensation), evaluation of corneal abrasion & determination of adverse events. The treatment was continued until complete corneal abrasion area reduction (complete re-epithelialization or epithelial regeneration line) could be observed. The primary outcome measure was the reduction in corneal abrasion area from the time of abrasion to 24 h, 3 days, and 1 week later. To avoid corneal ulcer occurrence the patient with TCA should encounter continuation nursing until recovery is perfect & negative fluorescein stain.

BSCL application was count effective if the patient was let go to the job next lens putting, complaint at continuation visits were lessened & no elaboration happen. After 1-week slit-lamp examination revealed a completely healed corneal abrasion with no epithelial defect then BSCL wears and EDs use was discontinued.

RCE is a periodic, unprompted disarrangement of corneal epithelium, can happen in corneal tissue debilitate by TCA months or years previously. Symptoms of RCE comprise pain, sandy-gritty feeling & scare from light.

Table 1: Patient demographics.

Gender	No. of cases
Male	30
Female	20
Age	No. of cases
= or > 12	35
= or > 12	15



This complication was not observed in our study & we tell the patients to call me by mobile when any complaint & no one is calling for any complaint during six months of study.

Results

A total of 50 cases were enrolled in our study during the study period of 6 months. Out of 50 patients, there were 30 males and 20 females and the male/female ratio was 3:2. The patient's age was ranged from 5-35 years. The commonest cause of injury was direct minor trauma (90% of cases) with contact lens-related problems accounting for 10% of presentations. All patients were treated within 24 hours of the trauma. The size of the abrasion varied from 1X2 mm to total abrasion of the cornea, the later occurs mainly in cosmetic lens wearers. The chief complaint of TCA is eye pain (occasionally severe), photophobia, blepharospasm, tearing, and foreign-body sensation, blurred vision, and sometimes presented with lid swelling. All patients received anesthetic ED (tetracaine 0.5%) before the examination, then applied fluorescein strip in lower cul de sac then examine the patients by slit lamp with blue cobalt light to confirm the diagnosis, after that we put antibiotic ED (ofloxacin 0.3%) with preservative-free lubricant ED then the BSCL inserted, then measure visual acuity [VA] by Snellen chart, after that cycloplegic ED (cyclopentolate 1%) was administered. The amount of anesthetic used should be minimal, as these agents have been shown to slow wound healing. All patients (100%) experienced immediate pain and blepharospasm relief. The patients were examined after 24 hours, there was no tight lens complication, after 3 days we stop the cyclopentolate 1% ED, and 1 week thereafter we remove the BSCL & stop EDs. The patients reported only minimal or no discomfort during treatment. After 1 week when removed the BSCL no epithelial defect was observed by stain the cornea with fluorescein strip. There was no evidence of corneal infection. No precipitates were observed on BSCL.

According to the classification of the emergency department, 30 cases were adult patients (> 12 years of age) and 20 cases were pediatric (< 12 years of age). Patients' demographics are shown in table 1, 60% of cases more than 12 years, 40% less than 12 years, and regarding sex males more than females, the ratio 3:2 (Table 2).

Conventionally TCA managed by PP, antibiotic &

Table 2: Causes of traumatic corneal abrasion.

4	Grit in the eye
11	Baby pocked finger in the eye
2	A sheet of paper in the eye
3	Cigarette in eye
5	Contact lens wear
2	Fell off motorcycle
3	Tacking out makeup
6	Foreign body hitting the eye
5	Punched in eye
2	Scratched in the eye by bird's claw
7	Pencil pocked in eye

cycloplegic EDs with a concept that PP would reinforce recovery & epithelial generation & bring out minimal ache. However considerable efforts have shown that this rule not only has no advantage but also that PP may bring in a lack of binocular vision & patient incompetence [30].

Seven studies in patients with TCAs displayed comparable recovery averages between PP & non PP [28]. Six studies assess ache & establish no distinction in four studies, while two studies preferable not to use PP, no variation in complications proportion were observed among PP & non PP series [31].

The investigators noted that PP did not improve healing rates or reduce pain and recommended no PP when treating TCA due to the loss of binocular vision and possible increased pain. Patients do not afford eye PP closely & commonly take off because of annoyance. A BSCL may be a perfect substitutional to PP, it allows seeing and oxygen permeability whilst enhancing corneal epithelialization & lessening ache & can be applied for many days without intricacy [32].

It used even in patients who wear contact lenses and presented with corneal abrasion, it should not be used in those with trauma caused by vegetable matter. Those treated with a BSCL noted less pain and lid spasm at once. They also reached the healing point more quickly.

As shown in table 3, VA ranged from 6/6 to 6/24 in the injured eye.

VA was done after the BSCL inserted and VA was documented correctly in 45 adult patients as shown in table 3, VA did not appear to have been attempted in pediatric cases because uncooperativeness, but after 24 hours & 1 week we assess the VA in the pediatric group after the eye become quite, those with VA less than 6/6 complain from simple refractive error and VA improved after wearing the glasses.

Discussion

After the corneal epithelial injury, there is a cellular response within 1-5 hr leading to infiltration by polymorphonuclear leukocytes and macrophages. The adjacent epithelium undergoes amoeboid transformation and cell division, and the defect may be covered within 24-48 hours. Epithelial stability requires the presence of an intact basement membrane, proper surface hydration, an absence of secondary infection, normal pre-corneal tear film function, and protection from further lid induced trauma during blinking [33,34].

Table 3: Visual acuity recordings in the injured eye.

Visual acuity at the time of injury	Number of cases (n = 45)	Visual acuity after 24 hour & 1 week
06-Jun	20	06-Jun
06-Sep	17	06-Jun
06-Dec	3	06-Jun
Jun-18	3	06-Sep
Jun-24	2	06-Sep



BSCLs may offer these conditions more reliably than an PP, just as they are helpful in the management of many corneal surface diseases. The study suggests that the primary treatment of TCAs with BSCLs has an apparent advantage over the traditional PP in terms of reduced pain during healing and speedier healing. To this can be added the further advantage of faster rehabilitation, this agreement with the study done by Mann I, [10], most of our patients were able to return to work with their BSCLs. A comparison of the healing time in the literature [35,36], revealed similar rates for the therapeutic BSCLs and the traditional PP. Another major advantage of BSCLs is rapid rehabilitation and a short time to resumption of normal activities, besides, the binocularity level is preserved. We did not record any cases of corneal infection. It is important to note that patient compliance is necessary since the treatment involves topical anesthetic, antibiotic, cycloplegic, lubricant EDs, and follow-up examination until removal of the BSCL.

A review of the literature on infectious keratitis associated with therapeutic BSCL wear in traumatic corneal abrasion revealed that only 1 of the 13 patients studied by Salz et al. [36] developed this complication, which cleared with topical antibiotic treatment and without visual loss. Vandorselaer, et al. [37] reported no complications during treatment for TCA in 176 patients, and this consistent with results in our study.

For fairly chosen patients, the BSCL appears to be a quite efficient therapy in an expression of quick recurrence to complete job & fast ache release, this coincides with a study done by Capt Kevin J. Knoop, et al. [21].

Some authors have suggested that a non-steroidal anti-inflammatory drug be added to the treatment for TCA to reduce inflammation and pain including ketorolac trometamol 0.5% and flurbiprofen 0.03% have been shown to have effective analgesic properties without delaying epithelial healing & may be used as an adjunct in non-infected TCAs [36,38,41-44].

However, in our study, this was unnecessary since after placement of the BSCL the pain subsides significantly or disappeared altogether and this agrees with the study done by Emil Gilad, et al. [21].

TCAs are very common in both the adult 90% and pediatric population 10% according to table 1. This not agreed with the report showed that 446 (55%) of 810 children attending an emergency department over 1 year had TCAs [39]. This is maybe due to the fewer numbers in our study. Ophthalmic examination of a child is inherently difficult, VA measurement in pre-school children is most likely to be impractical in the setting of an emergency department. However, in children of school age, VA assessment using a standard Snellen chart should be possible. A pinhole test should be performed where VA is below 6/9, to determine if a decrease in VA is due to a correctable refractive error. Lid examination and eversion are mandatory in all adult cases of corneal injury and in children

where possible, to exclude a subtarsal foreign body, especially in those with a vertical corneal abrasion. All cases must be examined with a slit-lamp examination as this allows the depth and size of abrasion to be documented accurately. Treatment of TCAs varies according to local protocol. One report has shown chloramphenicol to be no more effective than Fucithalmic in promoting corneal healing, or in reducing local side effects or signs of local infection [40]. We use ofloxacin ED. Cycloplegic agents have traditionally been used as cyclopentolate 1% in TCA to even though there is no scientific evidence to support this [40].

The use of PP is no longer widespread since the treatment of small TCAs without their use is safe and effective [18]. A BSCL may need to be fitted to provide both comfort and encourage healing by removing repeated mechanical disturbance from upper eyelid blinking.

For properly selected patients, the BSCL seems to be a highly effective treatment modality in terms of a rapid return to full function and rapid pain relief.

In which this a prospective study & employ of BSCL was the essential therapy style, no rapprochement was set between patients cured with PP & BSCL.

Soft contact lenses are an important risk factor for the development of infected corneal ulcers, but traumatic abrasions are also a risk factor, and we believe that with properly fitted BSCLs, and with the use of a prophylactic broad-spectrum antibiotic, the risks are minimal over such a short period. In our study, all BSCLs removed after one week from injury, and no infection seen in all patients. In most patients, the abrasion healed within three days, but the lens stays in the eye till 1week then removed. No problems of corneal edema were observed in our patients and the risk of corneal hypoxia does not appear to be important. This is reflected in the increased healing of the abrasion in the BSCLs patients possibly because these patients have greater oxygen exposure during the day when their eyes are open than those in the PP, who may be relatively hypoxic all the time.

No RCEs were seen in this study for this short follow-up for 1 week & we tell the patients to call me by mobile when any complaint & no one is calling for any complaint during six months of study. Brown and Bron, et al. [24] reviewing RCEs, found a history of trauma in 56% of 80 patients, 65% of which occurred within four months of the original injury. The limitations of our study are the relatively small number of patients, and the lack of long-term follow-up to assess the problem of RCEs.

Patients must be warned about the risk of RCE, especially in fingernail injuries. Patients should, therefore, be advised to re-attend if symptoms recur or persist and treatment should be started accordingly under ophthalmic supervision.



Conclusion

Our study advises that the therapeutic BSCL is the first-line approach is a safe and effective modality for treating TCAs & significantly shortens the time to resume normal activities. While BSCLs were applied for straightforward TCA & suitable continuation nursing for TCAs was strongly effective. We conclude that the results support the hypothesis that BSCLs used in the primary treatment of TCAs offer certain advantages over conventional PP. A BSCL permit the synchronous usage of eye drops, permit the ophthalmologist to watch the eye without taking off the dressing, permit the patient to have an applicable seeing in the influenced eye and displays safely superior fairness forever with the capability to wear sunglasses as wanted, a rapid & more convenient recovery time. Mild to large TCAs in even contact lens wearers can be successfully managed with BSCLs, antibiotics, cycloplegics, & PF lubricant EDs. My favorite technique for treating a TCA is a simple formula: anesthetic ED+ topical antibiotic 1X4+BSCL+ cycloplegic 1X1+PF lubricant ED 1X4.

References

- Wilson SA, Last A. Management of Corneal Abrasions, University of Pittsburgh Medical Center, St. Margaret Family Practice Residency Program, Pittsburgh, Pennsylvania. *Am Fam Physician*. 2004; 70: 123-128. [PubMed: https://www.ncbi.nlm.nih.gov/pubmed/15259527](https://www.ncbi.nlm.nih.gov/pubmed/15259527)
- Verma A. Senior Consultant, Department of Ophthalmology, Dr. Daljit Singh Eye Hospital, India.
- Dua HS, Forrester JV. Clinical patterns of corneal epithelial wound healing. *Am J Ophthalmol*. 1987; 104: 481-489. [PubMed: https://www.ncbi.nlm.nih.gov/pubmed/3674182](https://www.ncbi.nlm.nih.gov/pubmed/3674182)
- Wong TY, Lincoln A, Tielsch JM, Baker SP. The epidemiology of ocular injury in a major US automobile corporation. *Eye (Lond)*. 1998; 12: 870-874. [PubMed: https://www.ncbi.nlm.nih.gov/pubmed/10070526](https://www.ncbi.nlm.nih.gov/pubmed/10070526)
- Lai TY, Wong VW, Leung GM. Is ophthalmology evidence based? A clinical audit of the emergency unit of a regional eye hospital. *Br J Ophthalmol*. 2003; 87: 385-390. [PubMed: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1771629/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1771629/)
- Wong TY, Lincoln A, Tielsch JM, Baker SP: The epidemiology of ocular injury in a major US automobile corporation. *Eye (Lond)*. 1998; 12: 870-874. [PubMed: https://www.ncbi.nlm.nih.gov/pubmed/10070526](https://www.ncbi.nlm.nih.gov/pubmed/10070526)
- Faheem A, House RJ, Hal FB. Corneal Abrasions and Corneal Foreign Bodies. *Primary Care*. 2015; 42: 363-375. [PubMed: https://www.ncbi.nlm.nih.gov/pubmed/26319343](https://www.ncbi.nlm.nih.gov/pubmed/26319343)
- Myron Y. Ophthalmic Diagnosis & Treatment US automobile corporation. *Eye (Lond)*. 1998; 12: 870-874.
- Lim CH, Turner A, Lim, BX. Patching for corneal abrasion. *The Cochrane Database of Systematic Reviews*. 26; 7: CD004764. [PubMed: https://www.ncbi.nlm.nih.gov/pubmed/27457359](https://www.ncbi.nlm.nih.gov/pubmed/27457359)
- Mann I. Study of epithelial regeneration in living eye. *Br J Ophthalmol*. 1944; 28: 26 [PubMed: https://www.ncbi.nlm.nih.gov/pubmed/18169982](https://www.ncbi.nlm.nih.gov/pubmed/18169982)
- Dua HS, Gomes JA, Singh A. Corneal epithelial wound healing. *Br J Ophthalmol*. 1994; 78: 401-408. [PubMed: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC504797/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC504797/)
- Acheson JF, Joseph J, Spalton DJ. From the Department of Ophthalmology, St Thomas's Hospital, London SE7 7EH, Use of soft contact lenses in an eye casualty department for the primary treatment of traumatic corneal abrasions.
- Flynn CA, D'Amico F, Smith G. Should we patch corneal abrasions? A meta-analysis. *J Fam Pract*. 1998; 47: 264-270. [PubMed: https://www.ncbi.nlm.nih.gov/pubmed/9789511](https://www.ncbi.nlm.nih.gov/pubmed/9789511)
- Arrington GE. A history of ophthalmology. MD Publishers, New York. 1959.
- Weiner BM. Therapeutic bandage lenses. In: Silbert JA, ed. *Anterior Segment Complications of Contact Lens Wear*. Churchill Livingstone, New York. 1994; 455-471.
- Lima CA, Kara-Jose N, Nichols JJ. Indications, Contraindications, and Selection of Contact Lenses.
- Witcherle O, Lim D. Hydrophilic gels for biologic use. *Nature*. 1960; 185: 117-118.
- Salz JJ, Reader AL 3rd, Schwartz LJ, Van Le K. Treatment of corneal abrasions with soft contact lenses and topical diclofenac. *J Refract Corneal Surg*, 1994; 10: 640-646. [PubMed: https://www.ncbi.nlm.nih.gov/pubmed/7719534](https://www.ncbi.nlm.nih.gov/pubmed/7719534)
- Christie CL. Therapeutic contact lenses. *Cont Lens Anterior Eye*, 1999; 22: S20-S25.
- Arora R, Jain S, Monga S, Narayanan R, Raina UK, et al. Efficacy of continuous wear PureVision contact lenses for therapeutic use. *Contact Lens Anterior Eye*. 2004; 27: 39-43. [PubMed: https://www.ncbi.nlm.nih.gov/pubmed/16303526](https://www.ncbi.nlm.nih.gov/pubmed/16303526)
- Gilad E, Bahar I, Rotberg B, Weinberger D. A clinical study to evaluate therapeutic efficacy of soft contact lenses in corneal diseases.
- Punjabi S, Bedi N. Department of Ophthalmology, Geetanjali Medical College and Hospital, Udaipur, Rajasthan, India. A clinical study to evaluate therapeutic efficacy of soft contact lenses in corneal diseases.
- Buglisi JA, Knoop KJ, Levsky ME, Euwema M. Experience with Bandage Contact Lenses for the Treatment of Corneal Abrasions in a Combat Environment. *Mil Med*. 2007; 172: 411-413. [PubMed: https://www.ncbi.nlm.nih.gov/pubmed/17484314](https://www.ncbi.nlm.nih.gov/pubmed/17484314)
- Menghini M, Knecht PB, Kaufmann C, Kovacs R, Watson S Let al. Department of Ophthalmology, University Hospital Zurich, Zurich, and b Eye Clinic, Lucerne Cantonal Hospital Lucerne, Switzerland; c Sydney Eye Hospital, Sydney, N. S. W., Australia Traumatic Corneal Abrasions: A Three-Arm, Prospective Randomized Study.
- John G. McHenry, M. D. Bandage Contact Lenses.
- Brown N, Bron A. Recurrent erosion of the cornea. *Br J Ophthalmol*. 1976; 60: 84-96. [PubMed: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1042677/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1042677/)
- Morrison R, Shovlin JP. A review of the use of bandage contact lenses. *Metab Pediatr Ss'st Ophthalmol*. 1982; 6: 117-121.
- Dr. Syed M Shahid Foundation Year 2 Trainee, University Hospital Lewisham, Mr Nigel Harrison, Consultant Emergency Medicine, University Hospital Lewisham, Corneal abrasion: assessment and management.
- Lewis R. Patch Unnecessary for Corneal Abrasions, August 03, 2016 Chris HL Lim, Angus Turner, Blanche X Lim, Patching for corneal abrasion, First published: 26 July 2016, Editorial Group: Cochrane Eyes and Vision Group.
- Turner A, Rabiou M. Patching for corneal abrasion *Cochrane Database Syst Rev*. 2006; CD004764. [PubMed: https://www.ncbi.nlm.nih.gov/pubmed/16625611](https://www.ncbi.nlm.nih.gov/pubmed/16625611)



31. Flynn CA, D'Amico F, Smith G. Should we patch corneal abrasions? A meta-analysis. *J Fam Pract.* 1998; 47: 264-270.
PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/9789511>
32. Donnenfeld ED, Selkin BA, Perry HD, Moadel K, Selkin GT, et al. Controlled evaluation of a bandage contact lens and a topical nonsteroidal anti-inflammatory drug in treating traumatic corneal abrasions. *Ophthalmology.* 1995; 102: 979-984.
PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/7777307>
33. Yanoff M, Fine BS. *Ocular pathology.* 2nd ed. Philadelphia: Harper and Row. 1982; 132-136.
34. Hick G, Konen W, Klip. Lamellar or penetrating injuries of the cornea and their treatment by contact lenses. *Fortschr Ophthalmol.* 1984; 91: 32-34.
35. Arbour JD, Brunette I, Boiojolly HM, Shi ZH, Dumas J, et al. Should we patch corneal erosions? *Arch Ophthalmol.* 1997; 115: 313-17.
PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/9076201>
36. Salz JJ, Reader AL 3rd, Schwartz LJ, et al. Treatment of corneal abrasions with soft contact lenses and topical diclofenac. *J Refract Corneal Surg.* 1994; 10: 640-646.
PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/7719534>
37. Vandorselaer T, Youssfi H, Caspers-Valu LE, Dumont P, Vauthier L. Treatment of traumatic corneal abrasion with contact lens associated with topical nonsteroidal anti-inflammatory agent (NSAID) and anti-biotic: a safe, effective and comfortable solution. *J Fr Ophtalmol.* 2001; 24: 1025-1033.
PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/11913231>
38. Frucht-Pery J, Levinger S, Zauberman H. The effect of topical administration of indomethacin on symptoms in corneal scars and edema. *Am J Ophthalmol.* 1991; 112: 186-190.
PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/1543239>
39. Nelson LB, Wilson JW, Jeffers JB. Eye injuries in childhood: demographics, etiology, and prevention. *Pediatrics.* 1989; 84: 438-441.
PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/2771546>
40. Boberg-Ans G, Nissen KR. Comparison of Fucithalamic viscous eye drops and Chloramphenicol eye ointment as a single treatment in corneal abrasion. *Acta Ophthalmol Scand.* 1998; 76: 108—111.
PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/9541446>
41. Brahma AK, Shah S, Hillier VF, McLeod D, Sabala T, et al. Topical analgesia for superficial corneal injuries. *J Accid Emerg Med.* 1996; 13: 186—188.
PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/8733656>
42. Goyal R, Shankar J, Fone DL, Hughes DS. Randomised controlled trial of ketorolac in the management of corneal abrasions. *Acta Ophthalmol Scand.* 2001; 79: 177—179.
PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/11284758>
43. Kaiser PK, Pineda II R. A study of topical nonsteroidal anti-inflammatory drops and no pressure patching in the treatment of corneal abrasions. Corneal Abrasion Patching Study Group. *Ophthalmology.* 1997; 104: 1353—1359.
PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/9261326>
44. Frucht-Pery J, Levinger S, Zauberman H. The effect of topical administration of indomethacin on symptoms in corneal scars and edema. *Am J Ophthalmol.* 1991; 112: 186-190.
PubMed: <https://www.ncbi.nlm.nih.gov/pubmed/1543239>