



## Therapeutic uses of Soft Contact Lenses

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### ABSTRACT

*Soft contact lenses are widely used for correction of refractive errors and in diseases related to corneal surface irregularities. In this case series we have used soft contact lenses in treatment of patients having bullous keratopathy, corneal ulcer, dry eye, trichiasis and corneal perforation. Soft contact lenses were found to be superior than conventional method of treatment and they have revolutionized the management of corneal diseases. Visual improvement was found to be satisfactory in all cases along with definite improvement of symptoms in cases of corneal surface irregularities.*

### INTRODUCTION

Contact lenses are devices used to shape anterior surface of cornea enabling them to be used as excellent means for correction of refractive errors and corneal diseases related to corneal surface irregularities. Contact lenses have been used for various purposes like diagnostic, optical, cosmetic, therapeutic, occupational and research<sup>1</sup>. The concept of contact lenses dates back to 1508 AD when Leonardo da Vinci conceptualized substituting cornea with a new refractive surface. In prehistoric times when lenses were not available shells of methacrylate were used. Gauze soaked in honey was placed in the fornix to prevent symblepharon. In 1960 moulded lenses were used for therapeutic purposes by Witcherle and Linn.

This form of therapy represents a significant addition to the armamentarium of ophthalmologists for treatment of corneal diseases<sup>2</sup>.

Properties of soft contact lenses are high water content, permeability, flexibility and relatively low movement. They are made of hydrogel which have property of imbibing large quantities of water without dissolution. They also act as a bandage over the cornea and help in healing of corneal wounds thus improving visual acuity and giving symptomatic relief in various pathological conditions of the cornea. These lenses are resistant to biodegradation or attack by any enzyme constituent of normal or abnormal tears and also to thermal sterilization which was used as means of sterilization of lenses in our study. So we gave a trial of contact lenses for therapeutic purpose in five ocular conditions, i.e Bullous Keratopathy, Corneal Ulcer, Trichiasis, Dry Eye and Corneal Perforation

s.no	Ocular condition	No. of cases studied	Investigation	Treatment	Duration for which lenses were used
1	Bullous Keratopathy	20	Fluorescein staining	5%NaCl +antibiotic +soft contact lenses+cycloplegic if necessary	1-3 weeks
2	Corneal ulcer	20	Fluorescein staining, conjunctival smear	Antibiotic+cycloplegic+soft contact lenses	1-3 weeks
3	Trichiasis	20	Fluorescein staining	Antibiotic+cycloplegic if necessary+soft contact lenses	1-2 weeks
4	Dry eye	20	Fluorescein staining, Schirmer test	0.9%NaCl+antibiotic +miosol+soft contact lenses	1-3 weeks
5	Corneal perforation (2-4 mm)	20	Fluorescein staining, conjunctival smear	Antibiotic +mydriatic+ Soft contact lenses	1-2 weeks

**MATERIAL AND METHOD**

Trial with soft contact lenses (hydrogel lenses) was given in total 100 patients between the age group of 20-60 years. Study was done in 5 bullous Keratopathy, corneal ulcer, trichiasis, dry Eye and corneal perforation (2-4mm)<sup>3</sup>. In each condition 5 cases were studied. Material used was soft contact lenses (Hydroxy ethyl methacrylate) having 44% water content. Other materials available are HEMA-VP (with vinyl pyrrolidone) MMA-PVD which contains hydrophilic polymer PVP (polyvinyl pyrrolidone), monomer VP and hydrophobic MMA (methyl methacrylate). Diameter of lens used varied between 12-14 mm, curvature used was between 0.25 to 0.35 mm. These lenses were stored in normal saline and sterilized by keeping bottles containing lenses in boiling water for 15 minutes. Before boiling they were cleaned with Hydrogen peroxide. Wearing time of lenses was 24 hours. Lenses were sterilized and reused daily in the same patient under all aseptic precautions.

The investigations done and treatment given in each of the five conditions is as follows:-

Improvement of visual acuity and relief of symptoms and signs were seen daily. Complications if present were noted and treated<sup>4</sup>. Patients, after treatment, were followed at intervals of 15 days, 30 days, 60 days, and 90

days. At each visit improvement in visual acuity, slit lamp examination and relief from symptoms and signs were noted.

**OBSERVATION**

**Table 1: Visual acuity before treatment**

Visual acuity	6/60	5/60-3/60	2/60-hand movement	PL+PR
Bullous keratopathy	8	12	-	-
Corneal ulcer	4	12	4	-
Trichiasis	16	4	-	-
Dry Eye	8	4	8	-
Corneal perforation(2-4mm)	-	8	12	-

**Table 2: Visual acuity After Treatment with Soft contact lenses**

Visual acuity	6/60	5/60-3/60	2/60-hand movement	PL+PR
Bullous Keratopathy	16(80%)	4(20%)	-	-
Corneal Ulcer	12(60%)	4(20%)	4(20%)	-
Trichiasis	20(100%)	-	-	-
Dry Eye <sup>5</sup>	4(20%)	4(20%)	8(40%)	4(20%)
Corneal Perforation (2-4 mm)	16(80%)	4(20%)	-	-

**DISCUSSION**

In cases of bullous keratopathy, there was no/lesser rupture of bullae on blinking of the lids<sup>6</sup>. Exposed nerve endings were well covered with the Soft Contact lenses, which gave relief from pain. Symptomatic relief was obtained in 80% patients. Improvement of visual acuity was varying from 4meters to 6/36 because of decrease in corneal edema and reduction in irregularity of the corneal surface.<sup>7</sup>

In corneal ulcer patients, soft contact lenses promoted epithelialization and early healing of the ulcer. All corneal ulcers healed within 21 days. Visual improvement was seen in 60% cases and absence of symptoms and signs was noted in 80% cases.

In cases of trichiasis, soft contact lenses protected the cornea from the traumatic effect of the misdirected eyelashes. Improvement in visual

acuity and relief from symptoms and signs was observed in all cases (100%).

Soft contact lenses were found satisfactory in protecting the dry cornea and conjunctiva<sup>8</sup>. Minimum improvement in visual acuity (20%) and fair relief from symptoms and signs (60%) were noted<sup>9</sup>. The frequency of instillation of artificial tear drops was also found to be decreased. Rapid disappearance of filaments was observed due to protective coating by lens.

In cases of corneal perforation (of 2-4mm), lenses helped in formation of anterior chamber within 24-48 hours and wound healed faster<sup>10</sup>. Surgery was not required in such cases. There was improvement in visual acuity in 80% cases and symptoms and signs were relieved in all patients (100%)

## CONCLUSION

From the above data it was concluded that soft contact lens use has offered a definite benefit in the management of corneal diseases.<sup>11</sup>

In cases of bullous keratopathy, 80% patients showed visual improvement. In cases of trichiasis, there was 100% relief in signs and symptoms. In cases of dry eyes, it added to the effect of artificial tear drops and offered visual improvement in 20% cases. In cases of corneal ulcer, 60% patients benefitted in terms of visual acuity along with improvement in symptoms and signs. In cases of corneal perforation, 80% patients showed improvement in visual acuity and formed anterior chambers.

Consistent benefit noted in patients with trichiasis where physical barrier between the lashes and the cornea aided in improvement of patients symptomatically.

Majority of patients were relieved of symptoms and signs.

There is rapid healing of corneal ulcer and perforations. It also acts to increase the action and concentration of drugs at the site of infection thus aiding in drug delivery.

Thus we see that soft contact lenses were definitely beneficial in cases of bullous

keartopathy, corneal ulcer, dry eye, trichiasis and corneal perforation which were observed during this study.

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