



## TISSUE ADHESIVE IN THE MANAGEMENT OF CORNEAL THINNING OR PERFORATION

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**ABSTRACT** Tissue adhesive in the management of corneal thinning or perforation.**Purpose:** To evaluate the role of tissue adhesive in the management of corneal thinning or perforation.**Methods:** 14 eyes of 14 patients with descemetocoele or corneal perforation less than or equal to 2 mm in size with a positive seidel's test were included in the study. Structural integrity of the globe and complications were assessed after tissue adhesive application.**Results:** 14 eyes were treated with application of tissue adhesive. Resolution of the infiltrate with scar formation was attained and structural integrity of the globe was maintained in 9 eyes (64.3%). The mean time interval required for healing was 30.4 days. 5 eyes (35.7%) showed progressive worsening and required penetrating keratoplasty. 3 eyes (21.4%) required more than one application of tissue adhesive.**Conclusion:** Tissue adhesive is highly effective in the management of progressive thinning or corneal perforations less than or equal to 2 mm.**KEYWORDS :** tissue adhesive , cornea, perforation.**INTRODUCTION**

Perforations and impending perforations are urgent corneal problems that require immediate intervention. Surgery on inflamed or infected eyes does not offer the most optimal prognosis due to the increased risks of infection, synechia formation, and graft rejection<sup>(1)</sup>. Cyanoacrylates are a type of synthetic glues that polymerize rapidly when come in contact with a wet surface. Application of cyanoacrylate leads to a mild eosinophilic reaction, which occurs within 24 hours and the reaction is minimal by the 7<sup>th</sup> day. It has significant bacteriostatic properties also. The use of tissue adhesive offers an alternative as either a temporizing procedure or definitive treatment.<sup>(1)</sup> The tissue adhesives used in this study are high alkyl derivatives, isobutyl and n-butyl cyanoacrylate.

**AIM**

To study the effect of usage of tissue adhesive in the treatment of corneal perforation

**MATERIALS AND METHODS**

This 1 year descriptive study was done during September 2016 to September 2017 in K.S.Hegde Hospital ,Derlakatte, Mangalore. Our study included 14 eyes of 14 patients with descemetocoele or corneal perforation less than or equal to 2 mm in size with a positive seidel's test.

**Following were assessed**

- Etiology of perforation
- Number of application of tissue adhesive
- Need for penetrating keratoplasty
- Complications

**PROCEDURE:**

The application of tissue adhesive was performed with topical proparacaine anaesthesia either at slit lamp or under operating microscope. A lid speculum was placed. The slough and necrotic epithelium was debrided from the site of perforation or descemetocoele and from surrounding cornea. Intracameral injection of air- wherever required. The debrided surface was dried with a cellulose sponge and the tissue adhesive was placed using a 25 gauge needle or a spatula. The glue was allowed to dry. A bandage contact lens was applied to avoid friction and discomfort due to the rough surface of the glue.

Follow up was done after 1hr ,24 hrs,2 days ,1 week ,3 weeks, 6 weeks and 3 months

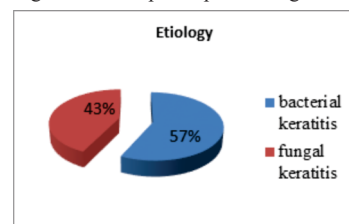
**Study design:** Descriptive and hospital based study. The collected information is summarized using frequency and percentage.

**Statistical analysis:** The results were statistically analysed. statistical analysis was performed on SPSS version 17.0 for Windows.

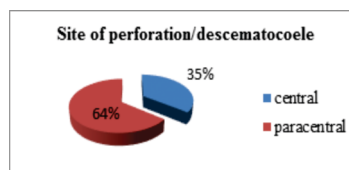
Descriptive statistics such as frequency and percentage for qualitative data and mean with standard deviation for quantitative data were used.

**RESULTS**

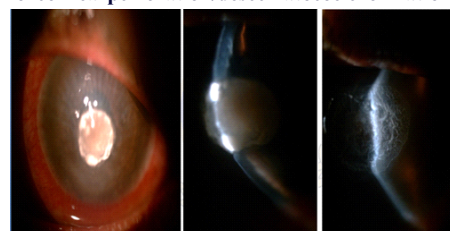
The mean age of patients was 52.71 (range of 34 to 72 years). 64% of patients were males (n=9) and 35% of patients were females (n=5). Of the 14 patients 8 were diagnosed with bacterial keratitis (57%) and 6 patients were diagnosed with fungal keratitis (43%) (**Figure 1**). 6 patients had infection in right eye and 8 had infection in left eye. 64% eyes (n=9) had site of perforation / descemetocoele (**Figure 2**) in the paracentral location and 35% (n=5) had in the central cornea. On application of tissue adhesive anterior chamber was formed in 24 hrs in all patients who had perforation (**Figure 3**). Tissue adhesive was removed by dialing in the presence of vascularisation & raised edges of adhesive. 3 eyes(21.4%) required re-application of tissue adhesive on one week follow up which had a positive seidel's test due to dislodgement of TA. 3 eyes(21.4%) had increase in size of infiltrate which was managed with therapeutic penetrating keratoplasty.



**Figure 1:** percentage of bacterial and fungal keratitis



**Figure 2:** percentage of patients who had central and paracentral location of corneal perforation/descemetocoele formation.



**Figure 3:** Showing day 1 ,1 week and 3 weeks following TA application

## DISCUSSION

Corneal perforations require urgent management to reduce subsequent ocular morbidity. In various studies tissue adhesives have been applied for corneal perforations varying from 0.5 to 3mm in diameter<sup>(4-10)</sup>. In comparison to a study by Daria et al<sup>(11)</sup> 3 out of 14 eyes underwent PKP due to increase in size of infiltrate with TA in place. Similar observation was noted in a study by Sharma et al<sup>(3)</sup> where none of the patients developed fresh infiltrate after the application of tissue adhesive. None of the patients in our study developed endophthalmitis that necessitated evisceration. Similar to a study by Siatiri et al<sup>(22)</sup> none of our patients developed giant papillary conjunctivitis & secondary glaucoma. Cyanoacrylate tissue adhesives are considered the standard of care for impending or manifest corneal perforations. They are easy to apply, provide tectonic support, arrest the progression of keratolysis, and possess antibacterial activity<sup>(12)</sup>. The cyanoacrylates used in this study are the higher alkyl derivatives, isobutyl and n-butyl. These are better tolerated than the methyl derivative<sup>(7,13-16)</sup>. No adverse toxic reactions such as early mild corneal haze around the glue,<sup>(17-21)</sup> surround tissue necrosis,<sup>(14)</sup> or increased limbal hyperemia<sup>(19)</sup> were noted in any of the patients seen in this study.

## CONCLUSION

- Our experience with the use of cyanoacrylate tissue adhesive suggests that it is highly effective at treating corneal perforations less than or equal to 2 mm diameter. It can be done as a temporising procedure before definitive surgical management. Healing frequently occurs with the adhesive alone and no further surgical intervention is required. Our study is an attempt to prove the effectiveness of tissue adhesive in corneal perforation. However larger sample size and longer follow up is required to further evaluate its efficacy.

## ETHICAL CLEARANCE:

An informed consent was taken from all the participants. The Ethical Clearance was obtained from institutional ethics committee, K.S.Hegde Medical Academy.

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