

## Keratoconjunctivitis caused by an unusual retained conjunctival foreign body: A frequently unrecognized entity

Catti Muniswamy Kalavathy, Pragya Parmar, Jayaraman Kaliyamurthy<sup>1</sup>, Christadoss Arul Nelson Jesudasan, Philip A Thomas<sup>1</sup>

**Purpose:** The purpose of this study is to describe a case series of keratoconjunctivitis caused by a retained bindi (dot) in six children who presented to a tertiary eye care facility in Southern India. **Patients and Methods:** Over a period of 11 years (January 2000 and January 2012), six children (all female, ranging in age from 6 months to 3 years) were diagnosed with ocular manifestations subsequent to a retained bindi. **Results:** All patients presented with redness, photophobia, extensive lacrimation, and blepharospasm. Two patients presented with mucopurulent conjunctivitis, three patients with suppurative keratitis and one patient presented with corneal epithelial defect. After removal of the foreign body the response to topical antibiotics was good in five of six cases, whereas one patient required therapeutic keratoplasty. **Conclusions:** Young children presenting with unilateral keratitis and conjunctivitis should alert the clinician to the possibility of a retained foreign body in the eye.

**Key words:** Bindi, keratitis, keratoconjunctivitis

A “bindi” (from the Sanskrit “bindu,” meaning “a dot”) is a forehead decoration worn by in South Asia and Southeast Asia. Traditionally, it is worn by women and children and consists of a dot of red or any other color applied to the center of the forehead between the eyebrows. Self-adhesive bindis (also known as sticker bindis) are made of felt or thin metal, with an adhesive on the side that is applied to the forehead. This bindi may be accidentally dislodged from the forehead, especially in children, and get lodged in the conjunctival sac, causing keratitis, corneal epithelial defects, and conjunctivitis. Management of such cases is hampered by the inability of children to provide a complete medical history and to cooperate during examination and treatment. Delay in management may cause serious visual impairment.

In this paper, we describe a case series of keratoconjunctivitis caused by a retained bindi in six children who presented to a tertiary eye care facility in southern India. To the best of our knowledge, such a series has hitherto not been reported in the literature.

### Patients and Methods

Over a period of 11 years (January 2000 and January 2012), six children (all females, age ranges: 6 months to 3 years) were diagnosed with ocular manifestations subsequent to a retained bindi at the Cornea Clinic, Institute of Ophthalmology, Joseph Eye Hospital, Tiruchirapalli, India. On presentation, a detailed clinical history was elicited followed by ocular examination using slit-lamp biomicroscopy (Zeiss) and an operating microscope. Where corneal ulceration was noted, the ulcer was scraped and processed for microbiological evaluation by a standard method.<sup>[1]</sup>

### Results

The clinical presentation, details of microbiological investigation (where done), and of treatment, and final outcome, are summarized in Table 1. In brief: The patients presented 2-30 days after the onset of symptoms, four patients presented within a week while the other two presented later. All patients presented with redness, photophobia, extensive lacrimation, and blepharospasm. Two patients (patients 3 and 5) presented with mucopurulent conjunctivitis, one (patient 1) present with corneal epithelial defect [Figure 1] and three patients (patients 2, 4 and 6) presented with corneal ulceration [patient 4 had a perforated corneal ulcer; Figure 2].

Examination under the microscope revealed a retained bindi in the upper conjunctival fornix in all six children. In each case, the bindi was removed with a sterile cotton bud/forceps after applying topical anesthetic drops (4% xylocaine).

Microscopic examination of corneal scrapes from two (patients 2 and 6) of the three patients who presented with corneal ulcers revealed only Gram-positive cocci; *Staphylococcus epidermidis* was recovered in culture in both patients. In patient 4, who presented with a perforated corneal ulcer, microbiological investigations were not done at presentation; however, this child underwent an emergency therapeutic keratoplasty after 24 h, and the excised corneal button was sent for microbiological investigation and grew a *Bacillus* sp.

In the two patients (patients 3 and 5) who had presented with mucopurulent conjunctivitis; topical ofloxacin (0.3%) therapy was started after removal of the bindi, these patients responded well to therapy. In patient 1, who had presented with an epithelial defect, patching of the eye was performed after removal of the bindi; this child responded well to topical ofloxacin. In patients 2, who had presented with a corneal ulcer, topical ofloxacin hourly and topical cycloplegic thrice daily were initiated after removal of the bindi and the ulcer healed completely, whereas patient 6 required a combination of ofloxacin and tobramycin eye drops. In patient 4, who underwent a therapeutic penetrating keratoplasty, the graft remained clear for 1 month postoperatively but, subsequently, opacification of the graft occurred; the final status could not be determined as the child was lost to follow-up.

Access this article online	
Quick Response Code:	Website: www.ijjo.in
	DOI: 10.4103/0301-4738.133524

Departments of Ophthalmology and <sup>1</sup>Microbiology, Institute of Ophthalmology, Joseph Eye Hospital, Trichy, Tamil Nadu, India

**Correspondence to:** Dr. Catti Muniswamy Kalavathy, Institute of Ophthalmology, Joseph Eye Hospital, Trichy - 620 001, Tamil Nadu, India. E-mail: cmkalavathy@gmail.com

Manuscript received: 08.06.13; Manuscript accepted: 22.03.14

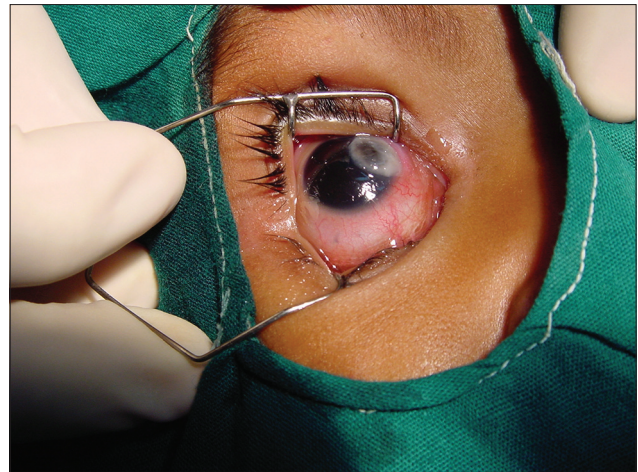
**Table 1: Characteristics of patients with retained bindis**

Patient number	Age/sex	Duration of symptoms (days)	Clinical features	Results of corneal scraping		Treatment/duration	Outcome
				Direct microscopy	Culture		
1	1 year/ female	3	Epithelial defect 5 mm×5 mm	Not done		Topical ofloxacin/ hourly×4 days	Resolved
2	8 months/ female	6	Corneal ulcer 6 mm×4 mm 30% stromal infiltration	GPC++	<i>Staph. epidermidis</i>	Topical ofloxacin/ hourly×14 days	Resolved
3	2 years/F	2	Conjunctival congestion++ Discharge++ Cornea clear	Not done		Topical ofloxacin/ hourly×2 days	Resolved
4	6 months/ female	30	Corneal ulcer 6 mm×4 mm Perforation in centre	Not done		Topical ofloxacin+ tobramycin/ hourly×2 days	TKP* done after 2 days
5	3 years/ female	2	Conjunctival congestion++ Discharge++ Cornea clear	Not done		Topical ofloxacin/ hourly×4 days	Resolved
6	1 year/ female	10	Corneal ulcer 4 mm×5 mm 50% stromal infiltration 1 mm hypopyon	GPC+GNB+	<i>Staph. epidermidis</i>	Topical ofloxacin+tobramycin/ hourly×15 days	Resolved

GPC: Gram-positive cocci, GNB: Gram-negative bacilli, TKP: Therapeutic keratoplasty. \**Bacillus* sp. was grown from the corneal button



**Figure 1:** Bindi retained in upper conjunctival fornix (patient 1)



**Figure 2:** Perforated corneal ulcer on presentation (patient 4)

## Discussion

A toxic keratitis has been reported to be caused by a wide range of solutions foreign to the eye, which include shampoos, lotions, and chlorinated pool water.<sup>[2]</sup> Eye cosmetics which are used extensively to highlight the eye, are normally applied externally to the ocular surface, can cause precorneal tear film instability and keratitis.<sup>[3]</sup> These effects are attributed mainly to the preservative constituent of cosmetic product material. A search of the Medline database, using the keywords “keratoconjunctivitis” and “bindi” did not reveal any previous report on this condition.

Foreign bodies are usually removed from the ocular surface by the protective mechanisms of blinking and tearing. However, foreign bodies may sometimes be retained and encapsulated by the mucus, and a local inflammatory response may be initiated. Tarsal foreign bodies, such as insect wing, and conjunctival synthetic fiber causing granuloma have been reported.<sup>[4-6]</sup> In our study, the three children (patients 1, 3, and 5) who presented within 5 days of onset of symptoms

presented with conjunctivitis or an epithelial defect. When a foreign body becomes embedded over a long period, exotoxins are possibly released by the bacterial flora surrounding the foreign body and this can lead to keratitis.<sup>[7,8]</sup> Whether a similar mechanism was responsible for the keratitis in our patients (patients 2, 3, and 6) is not clear.

Bindi is made of a synthetic fiber or a plastic patch backed by adhesive glue that contains p-tertiary butyl phenol. De-pigmentation of the skin following contact with this chemical has been reported.<sup>[9]</sup> The glue applied in the fibers may also have an adverse influence, although this has hitherto not been documented.

In two patients (patients 2 and 6), corneal scraping was done for microscopic examination revealed *S. epidermidis*. This is similar to the findings reported by other authors.<sup>[10]</sup>

## Conclusion

In this paper, we have reported the occurrence of conjunctivitis, epithelial defect and corneal ulceration

subsequent to a retained bindi in the upper conjunctival fornix in six female children. Management of these manifestations is potentially complicated by the patient's inability to cooperate during examination and to explain the sequence of events prior to presentation. Doctors should be aware of the risk of adverse ocular consequences of a retained foreign body in the eye. A child, presenting with unilateral conjunctivitis should alert the clinician to the possibility of a retained foreign body in the eye.

## References

1. Kalavathy CM, Parmar P, Kaliyamurthy J, Philip VR, Ramalingam MD, Jesudasan CA, *et al.* Comparison of topical itraconazole 1% with topical natamycin 5% for the treatment of filamentous fungal keratitis. *Cornea* 2005;24:449-52.
2. Bartlett JD, Jaanus SD. *Clinical Ocular Pharmacology*. 5<sup>th</sup> ed, Butterworth-Heinemann, Elsevier, St.Louis, Missouri, USA. 2008. p. 513.
3. Malik A, Claoué C. Transport and interaction of cosmetic product material within the ocular surface: Beauty and the beastly symptoms of toxic tears. *Cont Lens Anterior Eye* 2012;35:247-59.
4. Fogla R, Rao SK, Anand AR, Madhavan HN. Insect wing case: Unusual foreign body. *Cornea* 2001;20:119-21.
5. Venkatesh P, Lakshmaiah NC, Chawla R. Insect wing conjunctival granuloma. *Cornea* 2003;22:489-90.
6. Weinberg JC, Eagle RC Jr, Font RL, Streeten BW, Hidayat A, Morris DA. Conjunctival synthetic fiber granuloma. A lesion that resembles conjunctivitis nodosa. *Ophthalmology* 1984;91:867-72.
7. Babu K, Maralihalli RE. Insect wing tarsal foreign body causing conjunctival granuloma and marginal keratitis. *Indian J Ophthalmol* 2009;57:473-4.
8. Farooq MK, Prause JU, Heegaard S. Synthetic fiber from a teddy bear causing keratitis and conjunctival granuloma: Case report. *BMC Ophthalmol* 2011;11:17.
9. Bajaj AK, Saraswat A, Srivastav PK. Chemical leucoderma: Indian scenario, prognosis, and treatment. *Indian J Dermatol* 2010;55:250-4.
10. Singh G, Palanisamy M, Madhavan B, Rajaraman R, Narendran K, Kour A, *et al.* Multivariate analysis of childhood microbial keratitis in South India. *Ann Acad Med Singapore* 2006;35:185-9.

**Cite this article as:** Kalavathy CM, Parmar P, Kaliyamurthy J, Jesudasan CN, Thomas PA. Keratoconjunctivitis caused by an unusual retained conjunctival foreign body: A frequently unrecognized entity. *Indian J Ophthalmol* 2014;62:633-5.

**Source of Support:** Nil. **Conflict of Interest:** None declared.