

## Types of Ocular Surface Foreign Bodies and Their Location in the Eye

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### Abstract

**Purpose:** To study types of ocular surface foreign bodies and their various area of location in the eye.

**Study Design:** Cross sectional study.

**Place and Duration of Study:** This study was conducted at Maharani Laxmi Bai Medical College, Jhansi, Uttar Pradesh, India from July 2019 to June 2020.

**Material and Methods:** Age and gender were recorded for all patients. Detailed slit lamp examination was performed. Location of the foreign body was noted. Superficial foreign bodies were removed with the help of forceps. In case of impaction in the ocular surface, foreign bodies were removed with the help of sterile 27/26-gauge needle under topical anaesthesia.

**Results:** There were 300 patients with ocular surface foreign bodies included in this study. Ocular surface foreign bodies are found in different locations in the eye. Metallic particle was seen in 29% cases. In 22.30% cases parts of insect body were found, straw particle seen in 16.30% cases, dust particles were found in 15.60% cases, chemical exposure in 4.9% cases, thread/cloth particle in 4.1%, whole insect/fly in 3.7% cases, plastic material in 3.7% cases and contact lens was seen in one case. In the study corneal injuries were most common. In 42.86% cases cornea was involved, in 28.36% cases upper lid sub tarsal conjunctiva, in 17.35% cases palpebral conjunctiva, in 5.6 % cases inferior fornix, in 4.43% cases caruncle and in 1.4% cases superior fornix was involved.

**Conclusion:** Most common aetiology of ocular surface injury was metallic particle and most common location was cornea.

**Key words:** Foreign bodies, Ocular, Metallic, Corneal injuries.

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### I. Introduction

Trauma to the eye is a preventable cause of ocular injury. It is one of the leading causes of ocular morbidity<sup>1,2,3</sup>. A large number of hospital visits are due to eye injury<sup>4</sup>. Superficial ocular surface foreign body injury is the most common form of ocular trauma. It causes significant discomfort and if not properly managed can lead to permanent visual impairment. A patient may encounter this type of injury in a variety of settings for example at home, while playing, at work or as a result of accident or assault<sup>5</sup>.

Usually, ocular surface foreign bodies are small in size<sup>6</sup>. They are particles of iron, dust, insect wings, straw of vegetable matter, animal or human hair and threads of cotton or plastic. In most of the cases ocular surface foreign bodies are found on cornea, upper lid sub tarsal conjunctiva and palpebral conjunctival surfaces. They may also be found in fornices, and caruncle. Patients experience pain, foreign body sensation, watering and redness. If left untreated and not properly managed they can lead to erosion of underlying surface, establishment of infection, spread of infection leading to infective keratitis, conjunctivitis and endophthalmitis<sup>7</sup>.

Thorough eye examination including upper lid eversion is necessary in patients with history of foreign body. Insects recovered from the eyes need to be examined by entomologist to identify its nature, species and toxic effects if any. This may help in planning proper and targeted spray to seasonal crops to decrease the number of insects. This is useful in rural and semi-urban areas in term of economics, by reducing damage to the crops. Identification of the type of foreign bodies and their location of impaction into the eye will help in creating awareness and use of appropriate eye protective devices. This study was done to find the causes of ocular surface foreign bodies in a rural setting.

## II. Material And Methods

This prospective study was conducted in Maharani Laxmi Bai Medical College, Jhansi, Uttar Pradesh, India. Duration of the study was from July 2019 to June 2020. The study was approved by the ethical committee of the institution. Consent was obtained from all patients who were included in the study. All patients coming in eye out patient department with foreign body in eye were included in the study. This was a cross sectional study and sampling technique was purposive sampling.

Age and gender were recorded for all patients. Detailed slit lamp examination was performed. Fluorescein dye was instilled in the eye to delineate the location of the foreign body. Topical anaesthesia was given by instilling proparacaine 0.5%. Superficial foreign bodies were removed with the help of forceps. In case of impaction, the ocular surface foreign bodies were removed with the help of sterile 27/26-gauge needle. After removal of the foreign body topical antibiotic drops were instilled into the eye. Postoperatively topical antibiotic eye drops were prescribed for seven days. Nominal variables like gender, type and location of foreign body were presented as percentages

## III. Results

Total of 300 patients with ocular foreign bodies were included in the study. On average 3.36 patients with ocular surface foreign bodies presented per day. There were 152 (52.6%) right eyes and 140 (46.6%) left eyes. There were 08 (2.6%) bilateral cases. There were 196 (65.34%) males and 104 (34.66%) females. Male to female ratio was 1.8:1. Mean age in our study was  $39.46 \pm 20.57$  years.

Frequency and percentages of the type of foreign body are shown in **table 1**.

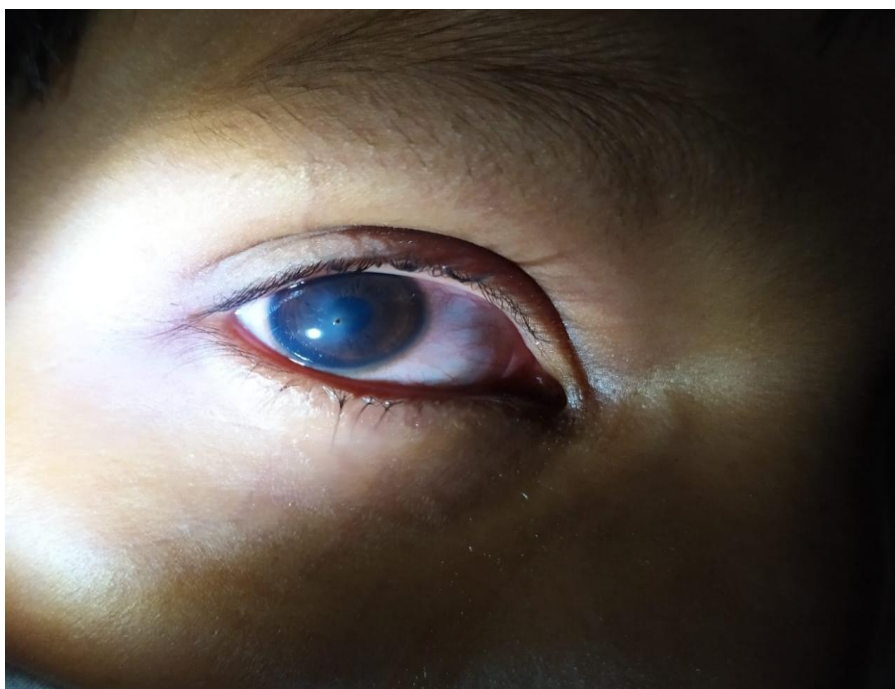
**Table 1: Types of ocular surface foreign bodies.**

Type of Foreign Body	Frequency	Percentage
Insect wing	67	22.30
Metallic Ring	87	29
Straw Particle	49	16.30
Plastic	11	3.7
Insect/Fly	11	3.7
Thread/Cloth particle	12	4.1
Dust particles	47	15.60
Contact Lens	01	0.4
Chemicals	15	4.90
<b>Total</b>	<b>300</b>	<b>100</b>

Frequency and percentage of location of foreign bodies is shown in **table 2**.

**Table 2: Distribution of location of foreign bodies.**

Location of foreign body	Frequency	Percentage
Corneal	129	42.86
Palpebral conjunctiva	52	17.35
Upper lid sub tarsal	85	28.36
Inferior fornix	17	5.6
Superior fornix	04	1.4
Caruncle	13	4.43
<b>Total</b>	<b>300</b>	<b>100</b>



**A male patient of 24-year age presented with metallic foreign body**

#### **IV. Discussion**

On an average 3.36 patients with ocular surface foreign bodies presented per day. Ocular injury with ocular surface foreign bodies was more common in males than females. Male to female ratio was 1.8:1. This is in close approximation to that presented by Reddy et al<sup>8</sup>. Males are at greater risk to trauma due to their exposure in occupation, travelling and assaults<sup>9</sup>. Mean age in our study was  $39.46 \pm 20.57$  years. Jahangir T and co-authors reported mean age of  $28.6 \pm 17.6$  years<sup>10</sup>. In another study the mean age of the patients was reported to be 35 years.

In 42.86% cases cornea was involved, in 28.36% cases upper lid sub tarsal conjunctiva, in 17.35% cases palpebral conjunctiva, in 5.6 % cases inferior fornix, in 4.43% cases caruncle and in 1.4% cases superior fornix was involved. This is in contrast to study conducted by Reddy et al where cornea was involved in 71.9% cases and in 28.03% cases conjunctiva and fornices were involved. In another study<sup>11</sup> conducted by Ozlem et al cornea was involved in 72.6% cases. This difference may be due to occupational variations<sup>12,13</sup>. Our study was conducted in a rural and semi urban area where most of the population is involved in agriculture and fields works. Corneal injuries most commonly occur due to metallic foreign bodies<sup>14</sup>. This sort of injury is commonly seen in occupations associated with engineering and industry<sup>15,16</sup>.

Ocular surface foreign bodies are found in different locations in the eye. This emphasizes the importance of thorough eye examination in case with history of foreign body in the eye.

In our study metallic particle was seen in 29 % cases. This is less than the injury by metallic particles in other studies. While in other studies similar percentage of metallic particle injuries is reported<sup>17</sup>. In 22.30% cases part of insect body was recovered from the eye. It may be due to driving practices of people. Most of the people riding a bike and cycle do not use helmets and eye wear to protect them from foreign bodies<sup>18</sup>. In 16.30% cases straw particles were found. This is due to agricultural background of the region<sup>19</sup>.

In our study right eye was more commonly injured. In the study done by Reddy et al where right eye was more commonly involved.

Ocular surface foreign bodies are found in all parts of the ocular surface. More exposed parts like cornea, upper lid sub tarsal and palpebral conjunctiva are more prone to get such sort of injuries. Sub tarsal space gets foreign bodies due to its anatomical configuration<sup>20,21</sup>. We did not include the profession and occupation of the patients in our study. This is limitation of our study. Moreover, our study is limited to semi urban and rural area. Our results may not be applicable for other settings.

#### **V. Conclusion**

Ocular surface foreign bodies are common form of ocular trauma. More exposed parts of the ocular surface receive majority of trauma due to superficial foreign bodies. Most common aetiology of ocular surface injury was metallic particle and most common location was cornea.

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