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Case Report

Multiple migratory caterpillar hairs in the eye – A case report

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ABSTRACT

A 40-year-old male presented with a history of caterpillar fall in his right eye with subsequent foreign body feeling, discomfort, and redness to a tertiary care facility in southern India. His best corrected visual acuity in both eyes was 6/6. The IOP in both eyes were within normal range. Multiple caterpillar hairs were seen during a thorough examination of the right eye, in the palpebral conjunctiva, the superficial and deep corneal stroma, and the anterior chamber. There was no anterior chamber reaction. The fundus examination were within normal limits. Under topical anaesthesia, caterpillar hairs in the conjunctiva were removed with the help of forceps. The patient was started on topical steroids and antibiotics. The patient was carefully monitored. The patient's symptoms had improved. During the next visit, caterpillar hairs in the superficial cornea was removed. Despite having hairs in the anterior chamber, this patient had no anterior or posterior chamber reactivity. Two hairs on the iris were visible during the next follow-up, but there were none in the cornea or conjunctiva. The patient is still being followed up on regular basis (9 months). Caterpillar hairs have the capacity to move intraocularly through the cornea and are known to elicit an inflammatory response in the eye. Therefore, it is important to be aware of the potential for intraocular inflammation following the quiescent stage.

1. Introduction

The word "Ophthalmia Nodosa" comes from the nodular conjunctival reaction that some insects (particularly caterpillars) and plant debris cause in the eyes, which causes an inflammatory reaction.[1] Caterpillar hairs can be directly rubbed into the eye or blown into the conjunctival fornices by the wind. They can also forcefully pierce the conjunctiva or cornea like a bullet. The initial reaction is followed by a variable quiescent interval during which the hairs migrate through the ocular tissues and then severe inflammation recurs.

2. Case Report

A 40-year-old male, who had been experiencing a foreign body sensation in his right eye for two days came to our tertiary care hospital located in Southern India. He gave a history of caterpillar fall two days back while driving. He complained of excessive watering, redness and irritation in his right eye. He gave no complaints of discharge, photophobia, or blurring of vision in his right eye. The best corrected visual acuity was 6/6 in both eyes. Both eyes had normal intraocular pressure. Slit lamp examination of the right eye showed diffuse oedema of the upper lid. Two caterpillar hairs were detected in the lower palpebral conjunctiva and three hairs in the upper palpebral conjunctiva, and there was diffuse congestion of both the palpebral and bulbar conjunctiva. One hair was

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found at 5 o'clock and two hairs were present at 6 o'clock in the deep layers of the cornea, and there were numerous superficial linear criss-cross corneal abrasions visible across the cornea. The anterior chamber had a normal depth, with no cells, flare, or hypopyon, and had hairs at the five and six o'clock positions as well as between the five and six o'clock positions (Figure 1). The lens was clear, and the pupil was 3mm, round and reacting to light. The examination of the left eye was within normal limits. Under high magnification

conjunctival hairs were removed with forceps and a 26-gauge hypodermic needle, under topical anaesthesia, and the patient was started on topical antibiotics and steroids. Deep stromal hairs were left untouched. Anterior segment OCT showed intrastromal hair in the cornea and anterior chamber (Figure 2). After three days, the patient complained of a foreign body sensation. Upon inspection, there were two more hairs in the lower palpebral conjunctiva, which were removed. The inferior third of the cornea had criss-cross numerous linear abrasions. Hair that was seen in the deep layer of cornea migrated anteriorly and was seen in the superficial layer of the cornea. Hairs in the anterior chamber remained in the same position and no anterior chamber reaction was seen. Right eye fundus examination revealed no vitreous cells or chorio-retinal abnormalities. He returned on the tenth day complaining of a foreign body sensation, and upon inspection, there were two hairs in the upper palpebral conjunctiva that were removed with the help of forceps. The superficial hair in the cornea at 6 o'clock was removed. The patient improved symptomatically. Follow-up after two months revealed a vertical linear opacity at the four o'clock position and two anterior chamber hairs stuck to the iris at the five and six o'clock positions. Because they were outside of the visual axis and didn't appear to be inflamed, these hairs were left in their original location. Caterpillar hair in this instance did not cause any anterior chamber or posterior segment reaction. The patient was once again inspected for hairs at the future follow-up. The patient is monitored on a regular basis.

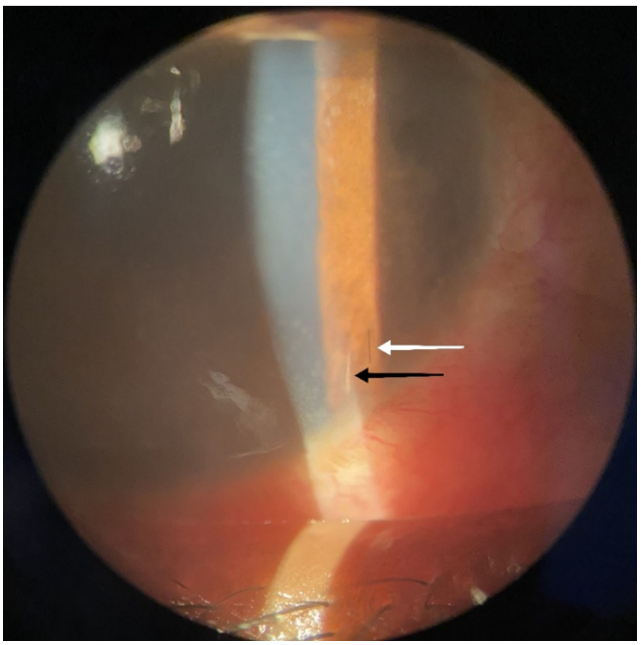

Fig. 1: Clinical picture showing caterpillar hair in cornea (Black arrow) and AC (White arrow)

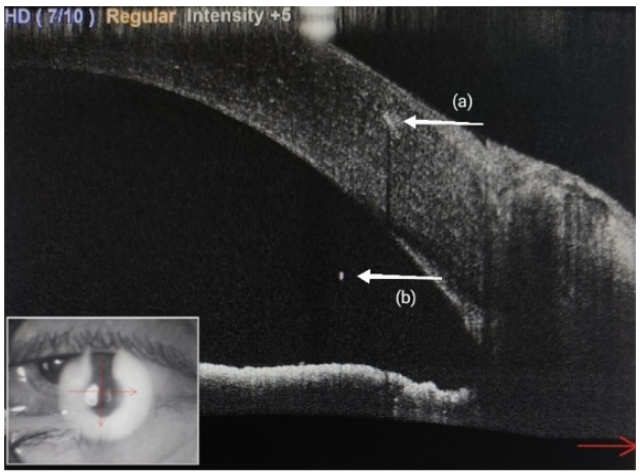

Fig. 2: AS-OCT showing caterpillar hair in cornea (A) and in AC (B)

3. Discussion

In 1861,[1] Schön provided the first description of this disease.[2] In 1883, Pagenstecher coined the term "Ophthalmia Nodosa" to describe the whole range of clinical symptoms.[3] It is surprising that the first instance in India was documented in 1968.[4] After going by several other names, including pseudotrachoma (Schmidt Rimpler, 1899) and pseudotuberculosis (Wagenmann, 1890), Saemisch re-classified it as Ophthalmia Nodosa (1904).[5] Caterpillar setae injuries have been linked to ophthalmia nodosa, a condition that can result in a number of ocular conditions, including keratoconjunctivitis, conjunctival nodules, iridocyclitis, iris nodules, vitritis, papillitis, chorioretinopathy, endophthalmitis, and pan-ophthalmitis.[6,7]

The number of hairs was much higher in injuries when the power of the impact was greater than other injuries (such as those sustained while riding a bike). The effect and the depth of penetration, however, did not correlate in any way.[8] The patient in our instance had a similar history of a caterpillar fall while riding a bike, which may have contributed to the numerous hairs.

Many suggestions have been put out speculating on a potential mechanism for setae movement.[7,9] According to Gunderson et al.[7] the setae are propelled forward by the movements of globe as well as the continuous movement

of the iris since the setae lack a source of propulsion of their own. The hairs possess barb-like projections directed toward the distal tip, allowing for forward penetration while making extraction against the direction of the barbs extremely difficult.[10]

In an analysis by Sethi and Dwivedi, they found that the majority of Western papers mentioned having barbed hairs, probably due to the type of caterpillar existing there. The caterpillar's hairs are often sharp, smooth, and free of barbs in Indian instances. It's likely that the shorter quiescent times in Indian instances are caused by the smooth and sharp hairs passing through the eye's tissues more quickly and easily.[11]

Caterpillar hairs in the eye were originally described in a case from Northern India by Gupta and Hari Gopal.[4] In their instance, a large number of caterpillar hairs were seen in palpebral conjunctiva as well as in the cornea with surrounding infiltration. They removed as many hairs as they could, with the exception of the deep ones, which they left in situ. After a few months, there were no adverse effects on the eyes. All the hairs were removed except for the one that was located deep in the cornea and parallel to the plane of the cornea. The eye examination in that case had practically no reaction many weeks later, and the hair was in the same location, identical to our patient, in Gupta and Hari Gopal's experience.

The hairs are so tiny and thin that they can easily be missed during normal inspections. They can also penetrate an intact cornea, producing inflammation inside the eye that, in some cases, is severe enough to call for enucleation.[12]

Ibarra et al. described a case of intraocular caterpillar setae in a 4-year-old kid without iridocyclitis or subsequent vitritis.[13] It's unknown why there isn't any intraocular inflammation. It's possible that fibrous encapsulation, which has been previously discussed in the literature,[14] is crucial in blocking the entry of antigenic material from the foreign body and so lowering the risk of an inflammatory reaction. Our patient also showed no signs of vitritis or iridocyclitis.

The majority of the literature on caterpillar hair intraocular penetration is in the form of individual case reports and small case series.[10,15–21] In a retrospective review by Sengupta et al., 54% patients had intracorneal hair at presentation, of which 23.75% demonstrated intraocular migration. The only element that was substantially linked to hair penetration was the presence of intracorneal hair.[22] Intraocular penetration of hair into the iris, vitreous, and retina can occur at variable intervals ranging from a few days to as long as six months from the initial presentation on the ocular surface. Posterior segment involvement can occur early or even years later. In their series, the vast majority of individuals with vitreoretinal hair lacked anterior chamber hair that would have favoured trans-scleral penetration. Despite the wide range of possibilities in the manifestations, the outcome in most of the cases were satisfactory, if diagnosed early and treated appropriately. The presence of intracorneal hair is a significant risk factor for intraocular penetration.[22]

The mechanical advancement of the hairs into the ocular tissues and exposure to a toxic protein secreted from the central venom gland within the caterpillar hair shaft are the pathophysiology of inflammation.[6,7,9,15,16,23]

Serious anterior segment reactions result from the setae entering the eye. However, topical steroids and cycloplegic often work to reduce anterior segment inflammation. In our situation, no invasive surgery was planned because the patient initially responded favourably to therapy with topical steroids and antibiotics, and no problems that may have endangered his vision developed.

Case reports of intraocular setae without reactivation have been documented.[13] These cases need to be constantly monitored since some of them have also been associated with late migration and late deterioration.[19] Until the end of the observation period, our patient had no symptoms and no anterior chamber reaction (9 months).

When a caterpillar injury occurs, patients should be instructed not to rub or wipe their eyes and to get medical help immediately. To completely remove all the hairs, typically more than one visit is necessary.

4. Conclusion

Caterpillar hairs have the capacity to penetrate intraocularly through the cornea and are known to elicit an inflammatory response in the eye. The corneal hairs have to be removed first to prevent intraocular penetration of the caterpillar hairs. So, the need for frequent follow up, initially for multiple hairs and later on for inflammatory reaction is necessary. Therefore, it is important to continually be aware of the potential for intraocular inflammation following the quiescent stage. The removal of all the intraocular caterpillar hairs is not always necessary. We can wait and observe for symptoms of inflammation.

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6. Conflict of Interest

None

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