

CASE REPORT

A Rare Human Case of External Ophthalmomyiasis due to *Oestrus ovis* in West China

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SUMMARY

Background: Myiasis is an infection of the tissues and organs occurring in animals or humans by fly larvae, and human ophthalmic myiasis has been described worldwide.

Methods: We report here a rare case of unilateral severe conjunctival ophthalmomyiasis due to the larvae of *Oestrus ovis* in Jixi city, Shaanxi province of west China, in which the climate is relatively dry and cold.

Results: The larvae were verified as the first instar larvae of *Oestrus ovis* according to the previously described morphological criteria.

Conclusions: For the first time, we present an optimal method to identify larvae under a microscope to make images sharper for accurate laboratory diagnosis and preserve the specimen for a long time so that laboratory staff can learn about the rare case, especially in the regions with dry and cold climate like ours, where laboratory staff are not familiar with the disease.

Accurate laboratory identification and prompt treatment will provide remarkable benefit to the patients.

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KEY WORDS

external ophthalmomyiasis, *Oestrus ovis*, diagnosis, west China, parasitic infection

INTRODUCTION

Myiasis is an infection of the tissues and organs occurring in animals or humans by fly larvae. Human ophthalmic myiasis is a rare parasitic ophthalmic infestation, which accounts for almost 5% of all human myiasis [1]. Ophthalmomyiasis is categorized as ophthalmomyiasis externa or interna, where the larvae appear on the conjunctiva or penetrate the intraocular area respectively [2]. Ophthalmomyiasis externa always happens in rural areas with a warm and humid climate, especially where close proximity to domestic animals is common. It is reported that ophthalmomyiasis externa has happened in several countries worldwide. All relevant literatures were searched from 2001 to the present on Pub-

med, and in China only one case of external ophthalmomyiasis due to *Oestrus ovis* was reported, which occurred in Shandong province of eastern China [3]. China is a vast country with a wide range of climates. Compared with Shandong province of eastern China, where the climate is hot and humid due to being close to the sea, the rare case we report here occurred in a city in Shaanxi province of western China with relatively cold and dry climate because of its landlocked location. The present case therefore highlights the awareness about *Oestrus ovis* to laboratory staff and ophthalmologists, especially occurring in cities with dry and cold climate and without history of close contact with domestic animals. For the first time, we present an optimal method to identify larvae. In addition, the method can be applied to specimen preservation, and the preserved specimens can be used to teach laboratory staff in areas where myiasis is rare.

CASE REPORT

A 61-year-old male in Baoji city, Shaanxi province in west China, was admitted to the eye clinic in Baoji People's Hospital on June 18, 2019, with a two-day history of left eye irritation and redness. He had no history of oculopathy nor close proximity to domestic animals. Two days before he was admitted to the hospital, he felt that something like a bug had struck his left eye while walking on the road. The ophthalmological examination revealed this had not affected his visual acuity in the left eye and the conjunctiva was congested. On slit lamp inspection, three white objects crawling over the conjunctiva were detected, with about 1 mm length and fast movement. After local anesthesia using 1% lidocaine, 3 larvae were extracted to a sterile cup containing normal saline with a fine forceps. The larvae, which were mounted on a microscopic slide, were inspected under a microscope at 100 x magnification. The spindle shaped skeleton with oral hooks in dark brown was observed (Figure 1A). The structure of the larvae became more transparent and clear when the larvae were fixed with 75% alcohol, covered with glue and a coverslip (Figure 1B), and when they were examined after drying, it could be clearly observed at 400 x magnification that the oral hooks were conjoined to a cephalopharyngeal apparatus including pharyngeal and hypo-pharyngeal sclerites (PS and HPS) (Figure 2A). Small crown-shaped bristles (CB) on the last segment, and two caudal pigmented respiratory spiracles (RS) in the caudal segment were observed (Figure 2B). The larvae were verified as the first instar larvae of *Oestrus ovis* according to the previously described morphological criteria. The patient was treated topically with antibiotics and corticosteroids after the extraction of the larvae. This kind of treatment was recommended to reduce inflammation and prevent secondary bacterial infection after mechanical extraction of the larvae. The symptoms and clinical signs resolved after a few days.

DISCUSSION

Ophthalmomyiasis, which mainly includes *Oestrus ovis*, latrine fly (*Fannia*), house fly (*Musca domestica*) and cattle botfly (*Hypoderma*), and sheep bot (*Oestrus ovis*), is provoked by various species of flies, and *O. ovis* is a parasite of sheep and goats all over the world.

The sheep nasal botfly *O. ovis*, which is a member of the Oestridae family, is the most frequent of several species of the dipteran fly, where the larvae are exclusive parasites in the frontal sinuses and nasal cavities of sheep but may result in myiasis in man. External ophthalmomyiasis is always a benign self-limiting illness unless the follow-on corneal abrasions are complex infections. Infections due to larvae with burrowing habits can lead to internal ophthalmomyiasis, where the infection can result in serious keratouveitis, loss of vision or even severe infection of the entire eyeball, especially in patients with low resistance. A few scattered cases of the ophthalmic myiasis caused by *Oestrus ovis* in humans were reported around the world [4-7]. Based on our extensive review of the literature, almost all affected patients were shepherds and farmers from rural regions who had been in close contact with domestic animals. Human myiasis always occurred in countries with relatively hot and humid climate. Therefore, human ophthalmomyiasis in a western city of China with relatively cold and dry climate like the present case is rare, and no relevant information about the kind of parasite infection in west China was available. Moreover, our patient in the city had no history of close contact with domestic animals. Classic history including a fly colliding with the patient's eye, followed by symptoms including pain, irritation, redness, foreign body sensation, and following development of edema reminded us and led to a correct diagnosis. However, many cases may happen without any previous exposure to flies; therefore, misdiagnosis is common, which may attribute the acute conjunctivitis to other reasons. Slit lamp examination is vital to picking up the larvae by topical anesthesia, which helps in the extraction process by fixing the eye and reducing the patients' reactions. Though prognosis is good, prompt diagnosis and early treatment contribute to avoiding threatening complications with panuveitis and retinal detachment. This case illustrates the importance of recognizing the clinical features and avoiding misdiagnosis. The clinical differential diagnosis includes conjunctivitis caused by a variety of reasons such as follicular conjunctivitis, foreign body conjunctivitis, allergic or viral catarrhal conjunctivitis and other parasitic reasons which puncture into the conjunctival rima occasionally, for example the beetles from genus *Paederus*. Besides a wet mount at 100 x magnification, for the first time we suggest that larvae fixed by 75% alcohol, covered with glue and a coverslip should be examined after drying at 400 x magnification under a microscope to obtain clearer images to identify the larvae accurately and preserve the specimen for a long time to teach the laboratory staff about the rare case, es-

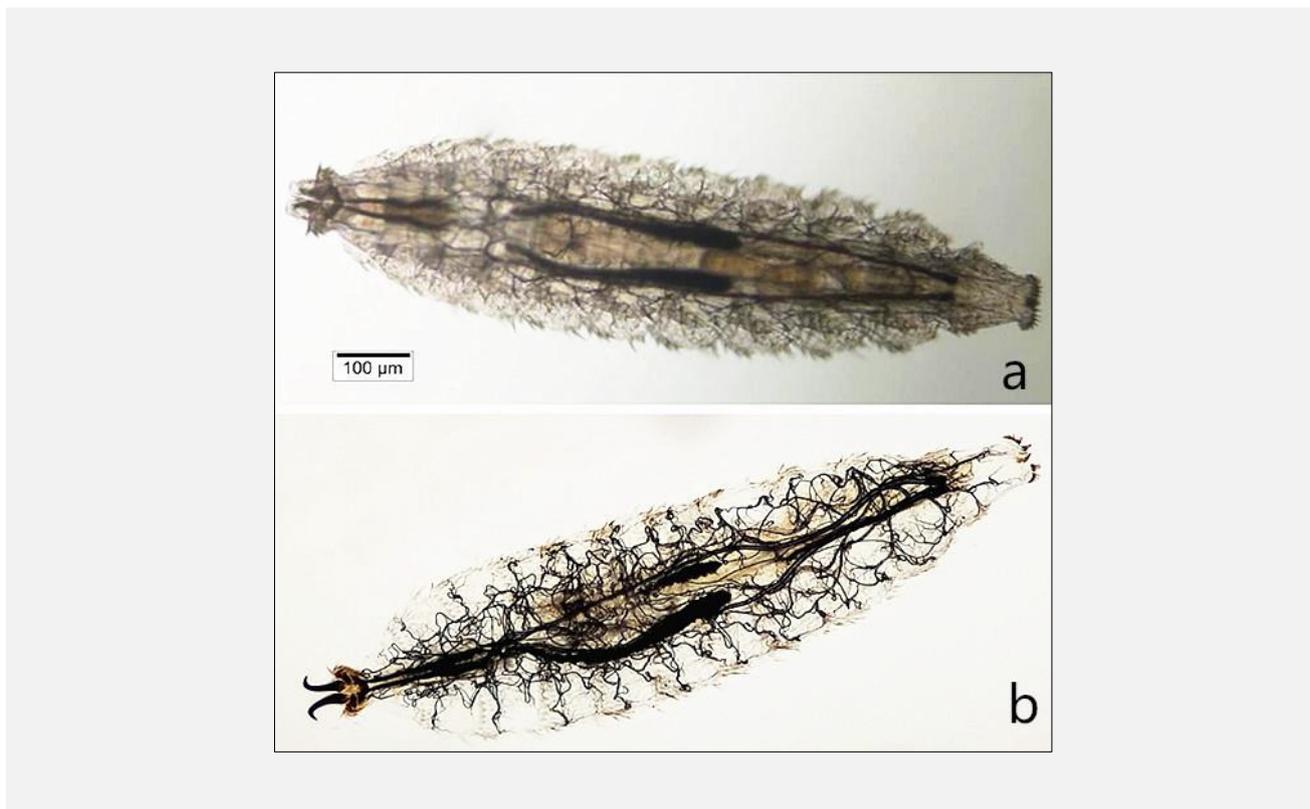


Figure 1. The first-stage larvae of *O. ovis*. The larvae of *Oestrus ovis*.

A - The larva was inspected under a microscope, the spindle shaped skeleton with oral hooks in dark brown was observed. B - The structure of the larva became more transparent and clear when the larvae were fixed with 75% alcohol, covered with glue and a coverslip (x 100).

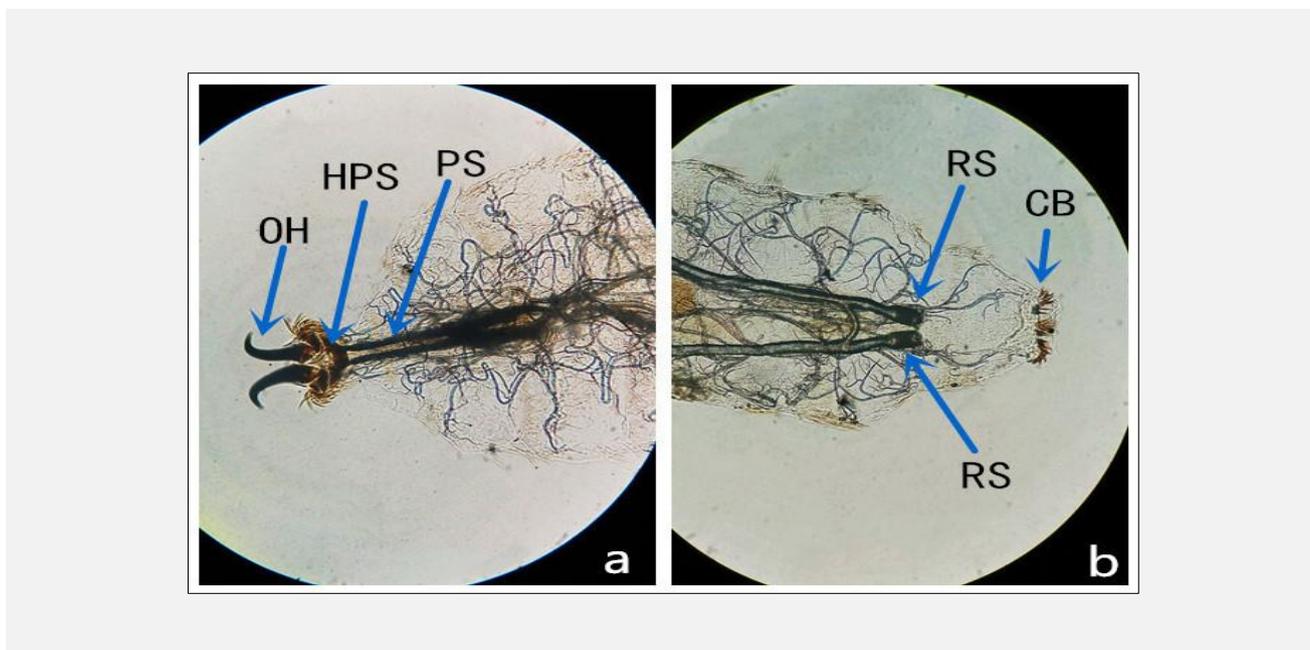


Figure 2. A - The oral hooks (OH) were conjoined to cephalopharyngeal apparatus including pharyngeal and hypo-pharyngeal sclerites (PS and HPS), B - Small crown-shaped bristles (CB) on the last segment, and two caudal pigmented respiratory spiracles (RS) in the caudal segment were observed (x 400).

pecially in the regions with dry and cold climate like ours, where laboratory staff are not familiar with the disease.

CONCLUSION

In conclusion, to avoid subsequent severe complications, laboratory staffs and ophthalmologists should be aware of *Oestrus ovis*, even in cities with dry and cold climate and without a history of close contact with domestic animals, which can result in a quicker diagnosis and effective treatment for the disease. Proper specimen handling and preservation are beneficial not only for identification, but also to teach laboratory staff in areas where the disease is rare.

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Declaration of Interest:

There are no conflicts of interest.

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