

Oral Myiasis and the Use of Doxycycline in Post-Operative Management as Local Drug

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ABSTRACT

Aim: To report a case of oral myiasis and its management in a spastic cerebral palsy patient.

Summary: Myiasis is the infestation of live human and vertebrate animal with dipterous larvae which feed on the host's dead or living tissue. This phenomenon is well documented in the skin, especially among animals and people in poorly developed and developing countries. When the tissues of oral cavity are invaded by the parasitic larvae of flies, the condition is called as oral Myiasis. A case of Oral Myiasis of a 12 year old boy already suffering from cerebral palsy is reported. The treatment consisted of manual removal of the larvae, surgical debridement of the wound and oral therapy with doxycycline used as a locally acting drug for faster and better recovery.

Keywords: Cerebral Palsy, Doxycycline, Myiasis.

found in third world countries.^{2,4-14} Although, myiasis in humans is extremely rare in Europe and in the Northern hemisphere, but it is not an uncommon parasitic infestation in the tropics and subtropics.^{2,11,12}

Laurence¹⁵ in 1909 was first to describe the condition 'oral myiasis'. Persistent mouth opening alongwith poor hygiene, suppurative lesions, and facial trauma may predispose the patient to oral myiasis. It has also been reported amongst the epileptic patients with lacerated lips following a seizure, incompetent lips and thumb sucking habits, advanced periodontal disease, at tooth extraction sites, fungating carcinoma of buccal mucosa as well as in patients with tetanus with mouth propped open to maintain his airway.²

Clinically it can be classified as primary and secondary. *Primary* myiasis is caused by biphagous larvae (feed on living tissue) which are common in cattle, rare in human beings. Whereas, *secondary* myiasis is caused by necrobiphagous flies (feed on dead tissue) which are more common in human beings with neglected oral and body care.⁵

The present paper reports a case of oral myiasis in a patient with cerebral palsy, and use of doxycycline as a broad spectrum antibiotic, and its assistance in healing of the gingival defect.

CASEREPORT

A 12 year old boy with spastic cerebral palsy was referred to the Department of Oral Medicine and Radiology with a complaint of swelling of the labial gingiva accompanied by bleeding and fetid odour from about 4 days. The patient was handicapped (unable to maintain his oral hygiene) and was unable to maintain his oral hygiene and was living in unhygienic conditions (cattle alongwith its faeces in the courtyard). The child presented with persistent mouth opening (a mouth breather). On examination maggots were found burrowing in the maxillary facial and palatal gingivae in the region of right incisors and canine (Fig. 1).

Under aseptic conditions, turpentine oil was applied deep in gingival burrow using syringe to drive the maggots out. With the help of tweezers the maggots were removed one by one. The area was later on irrigated with H₂O₂ and betadine

INTRODUCTION

The term 'myiasis', first coined by Hope¹ in 1840, is derived from Latin word '*muia*' which means 'fly' and '*iasis*' means 'disease'.² It is a pathology caused by the larvae in human and animal tissue that evolve to a parasite. Zumpt³ defined myiasis as the infestation of live human and vertebrate animals by dipterous larva, which at least for certain period feed on host's dead or living tissue, liquid body substances or ingested food. Myiasis frequently occurs in rural areas, infecting livestock and pets such as dogs and cats, and in humans, myiasis exists in unhealthy individuals frequently

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Figure 1: Maggots seen burrowing deep in the Labial gingival sulcus.

solution. Total number of 28 maggots was removed on the first day.

The patient was recalled on the second day and another 5 maggots were removed from the deep gingival crevices (Fig. 2). A thorough examination of the sulcus was done and a paste of doxycycline (100 mg tablet crushed and mixed with normal saline) was applied to the region (under the gingival flap and in the labial vestibule) to facilitate healing. The maggots were sent for entomological examination, but further reports could not be availed (Fig. 3).



Figure 3: Maggots after removal



Figure 4: Complete coaptation of gingival flaps seen (Day 5)

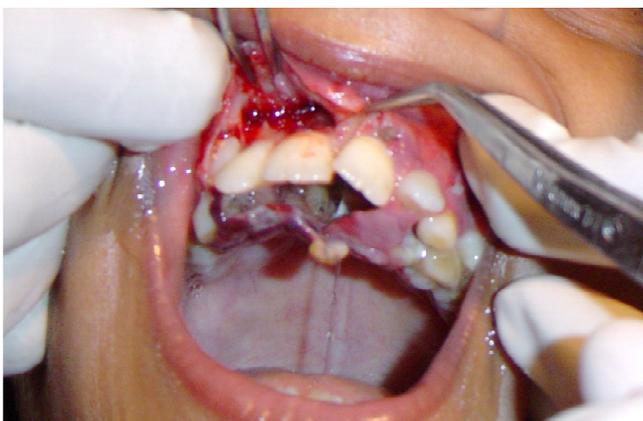


Figure 2: During removal of Maggots from Labial sulcus- Day 1

Five days later, the patient reported and was in good health. Examination revealed healing gingival tissue with complete coaptation of the gingival flaps (Fig. 4). The infected, bleeding gingivae and foul odour had completely disappeared. Patient is currently under active follow-up and remains asymptomatic, till he last reported 6 months after the active therapy.

DISCUSSION

Myiasis is an uncommon disease in humans and takes many forms including infection of skin, gut, nasal cavities and eyes as well as, occasionally the oral cavity. It occurs most commonly in rural than urban areas. Predisposing factors were secondary to medical conditions like diabetes mellitus, psychiatric illness, leprosy, mental retardation with open neglected wounds, and also in patients with mouth breathing habit. Other risk factors may be poor oral hygiene, facial trauma and suppurative lesions. It has also been described after teeth extraction.

Musca Nebulo is the commonest Indian housefly that is seen in abundance in human dwellings, and is very active during summer and rainy season. The life-cycle of a fly begins with egg stage followed by the larvae, pupa and finally the adult fly. The conditions required for egg laying and survival of the larvae are moisture, necrotic tissue and suitable temperature. Thus wounds, open sores, scabs, ulcers contaminated with discharges facilitate the same.^{2,8}

The patient in the present case was of low socio-economic status and was spastic. The patient was dependent on his parents and relatives for day-to-day routine activities since he had a neurological deficit along with persistent mouth opening; it provided a contributing factor for the occurrence of the present condition. It was the responsibility of parents to maintain hygienic conditions around the patient and the house to prevent such things from happening, (in this case patient used to lie around in the courtyard along with cattle).

The developmental transition via the larval stage requires an intermediate host. An empty extraction socket and existing periodontitis contribute for the mechanical support and suitable substrate and temperature for the survival of the larvae. The stage of larvae lasts for six to eight days during which they are parasitic to human beings. The larvae have backward directed segmental hooks with which they anchor themselves to the surrounding tissue. They are photophobic and tend to hide deep into the tissues for a suitable niche to develop into pupa. The presence of these hooks makes manual removal of larvae from the host difficult. So, when multiple maggots are detected as observed in our case, elimination can be achieved with agents like turpentine oil or topical irritants such as ether, chloroform, olive oil, calomel, iodoform and phenol mixture.^{2,5,10,11,16}

These larvae release toxins to destroy the host tissue, and proteolytic enzymes released by the surrounding bacteria decompose the tissue and the larvae feed on this rotten tissue. The infected tissue frequently releases a foul smelling discharge.²

Suggested treatment consists of manual removal of maggots, broad spectrum antibiotics and oral therapy with Ivermectin.^{2,4,6,12,16} Ivermectin is a semi-synthetic macrolide antibiotic isolated from *Streptomyces avermitilis* and has been found to be an efficient and safe method for treatment of myiasis.² Systemic Ivermectin may give favourable results in more severe cases. Also, broad-spectrum antibiotics such as ampicillin and amoxicillin are given when the wound is secondarily infected.¹⁶

Recent advances in periodontal drug delivery systems is a very important step taking place in providing accurate and precise treatment of inflammatory periodontal diseases.¹⁷ Wound healing actions of tetracyclines were cited as modulation of basement membrane laminin, MMPs, osteoblast and osteoclast functions by tetracyclines contribute to its effects on wound healing. Chemically modified tetracyclines (CMTs) are effective in inhibiting bone resorption by inhibiting osteoclastic actions and inducing apoptosis of osteoclasts, in addition to reducing bone resorption by inhibiting matrix metallo proteinases.^{18,19}

The use of doxycycline has not been documented in the literature for the management of oral myiasis. In this case,

after manual removal of the larvae, debridement and disinfecting, a decision was taken to apply doxycycline paste (100 mg tablet crushed and mixed with normal saline) as a local drug to facilitate healing of the large gingival defects both on the facial and palatal aspects. Local drug delivery systems provide several benefits; the drug can be delivered to the site of disease activity at a bactericidal concentration and it can facilitate prolonged drug delivery. The FDA has approved the use of an ethylene vinyl acetate fiber that contains tetracycline, a gelatin chip that contains chlorhexidine and a minocycline polymer formulation as adjuncts to scaling and root planing. The FDA has also approved doxycycline hyclate in a bioabsorbable polymer gel as a stand-alone therapy for the reduction of probing depths, bleeding upon probing, and gain of clinical attachment.¹⁹

However, even in the 21st century, all advances made by mankind in various fields including Oral Health seem to lie low when a case such as this is found. Even in the presence of the poorest of hygiene, flies laying eggs in the oral cavity, and these hatching to become maggots, and ultimately flies would be nothing less than a nightmare. Special care needs to be taken in medically compromised dependent patients as they are unable to maintain their basic oral hygiene. The prevention of human myiasis is by education, but unfortunately in the developing countries many people live in low hygienic condition, predisposing the occurrence of the infestation. Nevertheless, prevention of oral myiasis by educating people and controlling the fly population should be emphasized. Personal hygiene and sanitation are the keys to prevent myiasis.^{2,4,7,9,12,14,16} Furthermore, the need for proper education and guidance of parents/guardians of patients, who are unable to take care of themselves (cerebral palsy, trauma cases, severe senility, mental retardation etc) is of paramount importance.

CONCLUSION

It can be concluded that the local application of doxycycline as in this case, may provide satisfying result in the post-operative healing of the gingivae. This is the first time the concept of a local drug delivery to facilitate post-operative gingival healing of Oral Myiasis has been documented. The simplicity, ease of availability and the results were very encouraging in this case.

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