

## Oral Myiasis: Still a Curse in the Developing Countries, Case Report and Review of Literature.

Prof: Dr. Sankar Vinod .V<sup>1</sup>, Dr. Ninan Thomas<sup>2</sup>, Dr.Dheeraj Eldho Paulose<sup>3</sup>,  
Dr. Paul Steaphen<sup>4</sup>, Dr. Kiran K.S<sup>5</sup>

<sup>1</sup>(Professor and HOD, Department of Oral and Maxillofacial Surgery, Mar Baselios Dental College, Kerala, India)

<sup>2</sup>(Senior Lecturer, Department of Oral and Maxillofacial Surgery, Mar Baselios Dental College, Kerala, India.)

<sup>3</sup>(Final Year Post Graduate, Department of Oral and Maxillofacial Surgery, Mar Baselios Dental College, Kerala, India.)

<sup>4&5</sup>(Second Year Post Graduates, Department of Oral and Maxillofacial Surgery, Mar Baselios Dental College, Kerala, India.)

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**Abstract:** Myiasis is the infestation of dipterian larvae in the human and other vertebrate animals. Oral cavity is a relatively rare site for wound myiasis. This disease mainly affects the old age group because of lack of geriatric care. The reasons are altered medical status, lack of proper oral and personal hygiene and neglect in maintaining a clean and tidy environment for the old. Here we present a case of oral myiasis in a 76 year old bed ridden lady and discuss what is available in literature about oral myiasis and its management.

**Keywords:** myiasis, oral myiasis, wound myiasis.

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### I. Introduction

The term myiasis originates from the Greek word “myia” which means fly. Myiasis is defined as the human infestation of fly larvae. Myiasis can occur in any part of the body which is usually exposed to environment. But less common sites are mouth, throat, urogenital and gastrointestinal tracts. Myiasis mainly occurs in tropical and subtropical countries. According to the study conducted by Azoubel Antunes et al in 2011, India is ranked second after Brazil in the incidence of oral myiasis [1]. The contributing factors include, low socioeconomic status, poor oral and personal hygiene, poor clothing along with higher population of myiasis causing flies. Many cases of myiasis go unreported as a result of “cultural, social, and medico-political reasons.” Here we report a case of oral myiasis in a patient who was bed ridden for the last three years.

### II. Case Report

A 76 yr old bed ridden female patient came to the department of emergency medicine with her bystanders giving a chief complaint of ulceration over the mouth in the anterior maxillary region. They give a medical history of longstanding diabetes, history of myocardial infarction 4 years back and the patient was completely bed ridden for the last three years. Her vitals were checked and were within normal limits. Emergency maxillofacial consultation was sought from the emergency department.

Oral and maxillofacial surgeon completed a thorough oral examination and found ulcerated anterior labial and palatal gingiva with larval infestation (fig: 1). History of her medical condition and completely bed ridden life style, clinically observed mouth breathing (open mouth sleeping) were in favour of our diagnosis. Patient was under Ryles tube feed for the last three years. The larvae become active and mobile when the surgeon manipulated the wound. Clinically it was diagnosed as wound myiasis. Tetanus Toxoid injection was given and the maggots are mechanically removed after applying turpentine oil topically after protecting other oral sites with gauze soaked in Vaseline. Turpentine oil is an irritant and with that the larvae comes to the surface and aids in easy removal of the larvae. Extreme care is taken in not rupturing the maggots as it is proven that this will result in severe allergic reactions.



**Fig: 1**

The maggots which were freely mobile are removed and the deep seated ones are left as such because applying force in removal may cause them to rupture (fig: 2). 0.2% chlorhexidine mouth wash is used to irrigate and clean the oral cavity. Doxycycline 100 mg twice daily for seven days along with Ivermectin (6mg tab) twice daily was given for three days and the patient was recalled on the third day. A CT scan was taken to rule out the deep spread and palatal or nasal perforation by the maggots. The maggots were stored in 40% formaldehyde and later identified as larvae of house fly (*Musca Domestica*). The patient reviewed on the third day with complete cure from the disease. Bystanders are advised to maintain very good oral hygiene for the bed ridden lady and strict instructions are given to maintain clean and tidy household premises.



**Fig: 2**

We believe that the reasons for the larval infestation is the chronic bedridden status along with mouth breathing habit of the patient, improper geriatric care, and failure to maintain a clean household environment.

### **III. Discussion**

Myiasis is defined as the infestation of live humans or vertebrate animals with larvae of the insect belonging to the order Diptera (two winged flies). "God's punishment of sinners" is what they consider myiasis in Hindu mythology [2]. Bablani et al have mentioned the definition given by Zumpt in 1965 as "the infestation of live human and vertebrate animals with Dipterous larvae, which, at least for a shorter period, feed on host's dead or living tissue, liquid body substances or ingested food"[3]. Ambrose Pare is the first one to report the effect of maggots in wounds [4]. The reported average human age is 60 years and males are 5 times more affected than females. Myiasis causing flies prefer warm and humid climatic conditions and hence they are found all around the year in tropics and in temperate zones they are restricted to summer seasons [5]. The common families responsible for human myiasis include Oestridae (bot flies), Calliphoridae (blowflies) and Sarcophagidae (carrion flies) [6].

Based on the relationship to the host, they can be divided in to three groups. {1} obligate parasites - which grow on living healthy animals and {2} facultative parasites- which lives in the necrotic tissue of the animals, dead decaying plant matter or in the faecal matter of vertebrates. A third category can be considered when the eggs are accidentally ingested (accidental infestation) or inhaled resulting in gastrointestinal myiasis [7].

Another classification of myiasis is based on the site of infestation. When the larvae get infested in the skin especially in the wound, which is due to an obligatory or facultatory parasite, it is termed as cutaneous myiasis. In such wound myiasis larvae can feed on both necrotic and healthy tissues. Another condition is called furuncular myiasis in which the flies or the larvae penetrate the healthy skin and produce painful boil like lesion or furuncle. Migration of fly larvae in the skin creates a condition called creeping myiasis. [7, 8, 9]. Rene Caissie stated that wound myiasis is the most common type in United States. Based on the anatomic position myiasis can be divided in to dermal, subdermal or cutaneous, nasopharyngeal, ocular, intestinal or urogenital

[4]. Clinically myiasis can be classified as primary myiasis: which is caused by biophagous larvae that feed on living tissue, common in cattle but rare in humans and secondary myiasis: which occur in necrotic tissues and is common in humans [10].

Lee et al reported a case of nasal myiasis which was hospital acquired in an intubated patient [6]. Nasal myiasis in common population is usually associated with atrophic rhinitis and with poor personal hygiene. Complications following severe nasal myiasis include septal and palatal perforation, erosion of nasal bridge and adjacent structures like face and orbital cavity, facial cellulitis and ulceration of tonsils and pharyngeal walls also.

### **3.1. Diagnosis**

Rene Caissie explained the characteristic symptoms which help in the diagnosis of each type of myiasis. Furuncular myiasis has the many features like one or more boil like lesion on exposed skin with erythema which may be a few millimetres in size, with serous, serous sanguineous or seropurulent discharge from a central pole. There will be local symptoms like pain, temperature, pruritus, and movement of larvae inside the lesion. There may be small white worm like organism protruding from the small lesion if lateral pressure is exerted. If the lesion is immersed in water, air bubble may come out through the punctum. Definite diagnosis is possible only after surgical extraction and identification of the larvae. In creeping myiasis the larvae is difficult to identify since there may not be an exit in the skin. Sometimes they present as a clear linear serpentine dark tunnel called creeping eruption, commonly associated with *Gasterophilus* species [11].

Cutaneous myiasis (wound myiasis) is easy to diagnose as this requires detailed patient history and the clinician's experience in dealing with the same. Inflammation and allergic reactions are the commonest clinical manifestations of cutaneous myiasis [12]. Acute phase of myiasis is usually followed by cellulitis and secondary infection with *Staphylococcus aureus* bacteria.

According to Villwock et al, in case of head and neck wound myiasis, the possibilities of malignancy should be suspected and whenever possible biopsy of the wound site should be obtained at the earliest [2].

### **3.2. Oral myiasis**

This is a rare condition compared to the other body sites. First report of oral myiasis was given by Laurence in 1909 [13]. Myiasis infestation in oral cavity is usually secondary to conditions like cancrum oris, neglected or untreated mandibular fracture, mouth breathing, anterior open bite or incompetent lips and patients undergoing mechanical ventilation [5, 14]. Oral myiasis is also reported after dental extractions because of unhygienic practice and poor oral hygiene and advanced periodontal disease favours larval growth in the oral tissues. The most favoured site in intra oral myiasis includes the maxillary buccal vestibule and buccal and palatal gingival sulcus. This suggests the mechanism of direct inoculation of the eggs into the oral sites.

### **3.3. Treatment**

In case of furuncular myiasis, application of pressure along with traction will help in expelling the larvae out of the lesion. Petroleum jelly, beeswax or paraffin wax can be applied to the lesion if the pressure method is not effective against the larvae. This will take minimum of 24 hrs for the larvae to make its way out of the lesion. Another method is administration of 2 ml of lidocaine which helps in expelling the larvae out of the lesion. Surgical excision is considered only if other methods are proved to be failed. In any of these methods care should be taken to preserve the larvae and not to rupture it because this will cause secondary infection or sometimes massive allergic reactions. Failure to remove the larvae completely from the lesion will result in foreign body reaction and granuloma formation [12]. Tetanus prophylaxis should be considered always and proper antibiotics should be given accordingly [15,16,17].

*Gasterophilus* species in creeping myiasis is usually removed by using a needle. Wound myiasis is usually treated by antiseptic and dilute antibacterial solutions like hydrogen peroxide (10-15%), chloroform or vegetable oil. If maggots are remaining, they can be manually removed and surgery is considered only if the larvae are seated deeply in the tissues [18, 19]. Another simple way to deal with cutaneous myiasis is by simply occluding the wound orifice or by application of wax, nail polish, glue or chewing gum. These are the layman's choice as these are the majority of cases being affected by the diseases.

Chemotherapeutic agents are not completely effective against any maggots till now. Studies have shown that when given at a concentration of 100 times the bacteriostatic level, cefazolin decreases 70% of larval growth. Similarly 97% reduction in larval growth is seen with 1000 times the concentration of gentamycin. Other antibiotics like ampicillin, clindamycin or vancomycin had no effect in myiasis. This proves that antibiotics are of no use when compared to the traditional debridement for myiasis cases [4].

### **3.4. Treatment of oral myiasis**

Oral myiasis is treated by surgical debridement under local anaesthesia. The above mentioned treatment remedies with asphyxiating agents that is commonly used for cutaneous myiasis cannot hold well in oral cavity and hence surgical debridement is the only option. Topical application of turpentine oil to irritate the maggots and make them come to the surface, which will help the surgeon to mechanically remove the larvae is reported in the literature. Systemic therapy with Doxycycline, metronidazole and ivermectin are also successfully used in oral myiasis. 0.2% of chlorhexidine mouth wash can be used to maintain good oral hygiene for these patients [10]. Ivermectin is a broad spectrum antiparasitic drug belonging to the family macrolides. It is mainly used as a veterinary drug but recently the use in humans in altered doses has gained its importance. Mechanism of action is by release of GABA, which aid in blocking the nerve endings of the larvae leading to death [20]. Dose of ivermectin in oral myiasis is 200 to 400 mcg/kg body weight. The possible complications which are reported in the literature are neurotoxicity since the drug can cross the blood brain barrier and interaction with other systemic drugs.

Lima junior et al reported the use of nitrofurazone topical application for the non surgical management of oral myiasis in 2010. Nitrofurazone is a topical anti parasitic agent whose derivatives possess anti bacterial, anti protozoal and anti parasitic properties. Nitrofurazone is used at a concentration of 0.2%, which was used topically for 3 consecutive days [21]. Riberio et al reported the use of 50% of sulphuric ether for 1 minute for the asphyxiation of maggots along with 0.12 % chlorhexidine at the end of mechanical removal [20]

### **3.5. Prevention**

The predisposing factors which may favour the myiasis causing flies include summer season, contact with infected host, sleeping outdoors, poor oral and personal hygiene, and neglect of wound care, alcoholism, peripheral vascular disease and travel to an endemic area. Good oral hygiene, taking care of wounds and maintaining a good and clean environment greatly reduced the incidence of wound myiasis. Homeless, aged and medically compromised persons are at increased risk and should be well taken care of. Waste products both human and house hold should be properly managed in order to avoid potential environment for the flies to habitat [7,21,22,23]. Along with this, measures should be taken to kill the adult flies like using fly traps, using electrocuting grid, use of pesticide sprays etc [10].

Reported complications of untreated myiasis include, pneumocephalus due to penetration skull base by the maggots, bony destruction of the orbit and globe compromise, life threatening haemorrhages due to wound myiasis etc [2]

### **3.6. Uses of maggots**

Maggots help in separating the necrotic and healthy tissue in wounds thus making the surgical debridement easier. The mechanisms by which maggots help in wound healing are [4, 24, 25].

1. Plenty of exudates are produced by the host in response to the maggots and this facilitate in continuous irrigation and debridement of the wound.
2. Maggots kill, ingest and digest the bacteria that can infect the wounds.
3. By secreting allantoin.
4. Larval movement inside the tissue will accelerate the formation of granulation tissue which in turn will accelerate the wound healing.
5. Maggots induce liquefaction of necrosed tissue in the wound.
- 6.

## **IV. Conclusion**

Though wound myiasis is a common disease of the developing and underdeveloped countries, oral myiasis are rare. We believe that the reason for such larval infestation in geriatric population is mainly due to their altered medical status, lack of geriatric care, lack of personal and oral hygiene and neglect in maintaining a clean environment for the old. Though in our case larval invasion to the deeper structures was not present, chances of such clinical entity should always be suspected. According to the evidences we have, mechanical debridement is considered to be the best management for oral myiasis, but systemic medication has been tried recently. We believe that both systemic medication and mechanical debridement is necessary for oral myiasis to obtain a good cure from the disease.

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