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## RESEARCH ARTICLE

### ORAL MYIASIS: A SHORT OVERVIEW.

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#### **Abstract**

The term 'Myiasis' was first introduced by Hope (1840), refers to the invasion of tissues and organs of animals and human wounds and certain body cavities by the dipteran larvae which manifests as subcutaneous furunculoid or boil-like lesions. Oral myiasis is still more "rare" and "unique" owing to the fact that oral cavity rarely provides the necessary habitat conducive for a larval lifecycle. Oral myiasis is a disease associated with poor oral hygiene, mouth breathing and incompetent lips. Infestation of tissues of vertebrate species by dipteran larvae is pandemic but more frequently found in tropical and subtropical countries where poor hygiene, poor housing infrastructure, warm humid climate, and proximity with domestic animals prevail. Its diagnosis is made basically by the presence of larvae. This article focuses on etiology, clinical features and treatment modalities of oral myiasis in human subjects.

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#### **Introduction:-**

When tissues of the oral cavity are invaded by the parasite larvae of flies, this condition is known as oral myiasis. Larvae feed on living or dead host tissue for certain period of time. This may also infest different parts of the body as seen as in the cutaneous, nasopharyngeal, aural, ocular, wound, intestinal & urogenital myiasis. <sup>1</sup> Oral myiasis may present with various predisposing medical or anatomical conditions, where the oral or nasal passages are exposed to external environment for a very long time. Differently abled patients suffering from mental retardation, cerebral palsy, autism etc., have difficulty in maintaining oral hygiene by themselves, so if these patients have, anterior open bite, mouth breathing or incompetent lips, then it will provide a conducive environment for flies to lay their eggs and larvae to pupate. In a situation, if these patients have undergone tooth extraction, or if they have neglected mandibular fracture, if they undergo mechanical ventilation then they are at risk of infestation by these larvae. Conditions like Cancrum Oris and oral malignancies may also present as predisposing factors for this condition.

#### **Causative species:-**

Various species responsible are as follows <sup>2</sup>

1. *Calliphoridae* (timbu flies, screw-worm, green bottles & blue bottles)
2. *Sarcophagidae* (flesh fly)
3. *Oestidae* (warble flies & bottlefly)
4. Common house flies & bottlefly



*L to R: Close-up of the anterior end of a larva, showing the mandibles and one of the anterior spiracles. Adult of Dermatobia hominis (warble fly). Four larvae of Dermatobia hominis, removed from a human host. DPDx, Georgia Museum of Natural History.*

#### **Classification:-**

Oral myiasis can be classified as follows <sup>3</sup>

#### **Depending on viability of the tissue:-**

1. Primary (larvae feed on the living tissue)
2. Secondary (larvae feed on dead tissue)

#### **Depending on the condition of the involved tissue:-**

1. Accidental myiasis (larvae ingested along the food)
2. Semi-specific myiasis (larvae laid on the necrotic tissue in wounds)
3. Obligatory myiasis (larvae affecting undamaged skin)

#### **Depending on the site:-**

1. Cutaneous
2. External orifice
3. Internal organs
4. Generalized
  - a. Nose
  - b. Eye
  - c. Lungs
  - d. Ears
  - e. Anus
  - f. Vagina
  - g. Oral (rare)

#### **Another classification for myiasis:-**

They have been classified also as <sup>4</sup>

1. Those in which the larvae live outside the body
2. Those in which the larvae burrow into unbroken skin & development
3. Those which live in the intestinal or urinary passages
4. Those in which eggs or young larvae are deposited into the wounds or natural cavities in the body.

#### **Predisposing factors:-**

- ❖ Medical condition
  - Diabetes mellitus
  - Psychiatric illness
  - Leprosy
  - Mentally challenged patient with open wound
  - Mouth breather
  - Drunkards

- Senile
- Hemiplegic
- Nosocomial Infestations
  
- ❖ Other risk factors
  - Lack of manual dexterity
  - Poor oral hygiene
  - Anterior open bite
  - Facial trauma
  - Incomplete lips
  - Suppurative lesions
  - Thumb-sucking
  
- ❖ Also described after extraction of teeth
- ❖ Low socioeconomic states
- ❖ Pathological condition :-
  - Cancrum oris
  - Oral malignancies

### Entomology:-

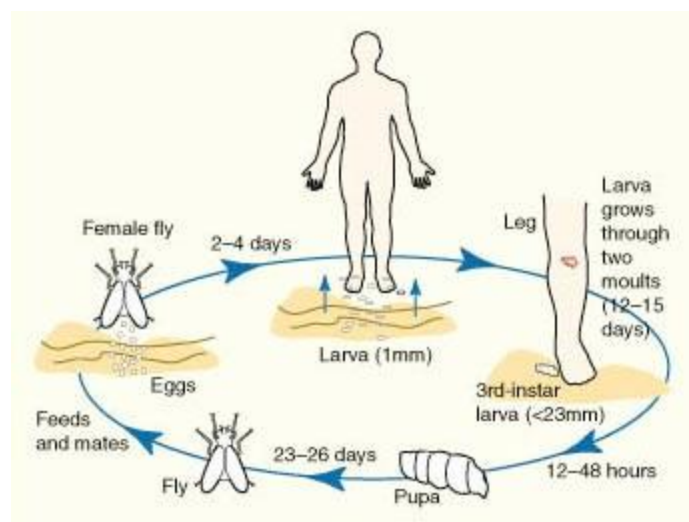
The genera commonly reported are *Sarcophagidae* and *Muscidae* from the Diphtheria order. After the fly lays eggs in the dead and decaying tissues, the larvae hatch in about 8-10 hours, soon after which they burrow into the surrounding tissues and in this stage, there will be tissues inflammation ensuing discomfort, which makes the patient consult doctor. This burrowing may cause separation of the mucoperiosteum from the bone. The opening of the burrow is usually kept patent with induration of the marginal tissues and is raised forming a dome shaped "Warbles". They position their heads down so that the posterior spiracles could become exposed to the open air to make respiration possible. After the young larvae penetrate the skin of the host, they take 8-12 days to develop into the pre-pupal stage and then leave the host to pupate.<sup>5, 6, 7, 8</sup>

The stage of larvae lasts for 6-8 days during which they are parasite to human beings. The larvae have backward directed segmental hooks with which they anchor themselves to the surrounding tissues for suitable niche to develop into pupa. This unusual type of gingival myiasis may occur in an unconscious or sleeping person when the mouth is left open. Periodontal diseases of the eggs to hatch and for the larvae to grow in the warm and moist conditions.<sup>9,10</sup>

A myiasis infection can be a very serious condition, for instance *C. Hominivorux* can deposit 400 eggs on an open wounds. Necrobiophagous flies (which feed on necrotic tissue) produce secondary myiasis. This is the most common type found in human and usually affects patients with lesions in necrotic cavities.<sup>11</sup>

Larvae release toxins to destroy the host tissue. Proteolytic enzymes released by the surrounding bacteria decompose the host tissue and the larvae feed on this rotten tissue. The infected tissue frequently releases foul smelling discharge,<sup>12</sup> the interaction of toxin or enzyme released by the larvae-bacteria can also cause bony erosions. The larvae complete their development in 5-7 days. They then wriggle out of the wound and fall to the ground to pupate.<sup>13</sup> The requisites for the egg laying and the survival of the larvae are the moisture, necrotic tissue and suitable temperature. Thus wound, open sores, scabs and ulcers contaminated with discharges make possible way for the same.<sup>14</sup>

The larvae are tapered in shape and greyish whitish in color with transverse rows. They are short, stout, light brown/black tipped posteriorly and directed spines along the tapering body.



(Geary M, Bernard H, Russel R and Hardy A. "Exotic Myiasis with Lund's Fly". *Medical Journal Of Australia*. 1999 ; 171 : 654-655)

### Clinical presentation:-

- ❖ Painful erythematous swelling, which pulsates on movement of larvae
- ❖ Infestation most often seen subcutaneously may produce a furunculoid or boil-like lesion also known as "BERNE".
- ❖ Completely benign, asymptomatic and mild or acute pain.
- ❖ Fungating larvae and unaesthetic appearance.
- ❖ Mild bleeding from the gingival sulcus with severe halitosis and severe periodontitis with teeth mobility.
- ❖ Generalized horizontal bone loss.

### Treatment:-

It is usually treated with debridement or scission, which consists of manual removal, sometimes with a topical asphyxiating medication that forces the larvae to emerge. The most efficient and safest systemic pharmacological therapy in humans is **Ivermectin**, which acts by disabling the parasite nervous system.<sup>15</sup> Recommended standard treatments also include the use of profuse and deep irrigation with home disinfectant, other antibiotics or larvicides and anti-parasites to ensure complete elimination of the infectious agents.<sup>16, 17</sup>

Topical asphyxiating agents are, turpentine oil, larvicidal drugs like Negasunt, ethyl chloride, ether, mercuric chloride, creosote, saline iodoform, chloroform, clove oil, calomel, phenol mixture, olive oil, gentian violet, alcoholic solution in association with tobacco, camphor, sodium hypochlorite.<sup>18, 19, 20</sup>

These agents asphyxiate the aerobic larvae and force them to a superficial position and these larvae are removed with less damage to the tissue and larvae as well. The rupture of larvae might cause allergic or foreign body reaction and secondary infection, so care must be taken not to rupture the maggots.<sup>8, 21, 22</sup>

Turpentine is toxic chemical as it can induce tissue necrosis. When applied topically, it can produce epithelial hyperplasia, hyperkeratosis, and ulceration. However, the damage is reversible, the hyperplasia will only persist when stimulus is continuously applied and regresses once, and it is withdrawn.<sup>23, 24, 25</sup>

Commonly used antibiotic regimen may include ampicillin, amoxicillin or metronidazole, Ivermectin, a macrolide that is activated by gamma aminobutyric acid liberation, lead to parasitic death and their spontaneous elimination by washing out larvae has been found out to be effective in humans.<sup>26, 27, 28</sup>

Nitrofurazone topical application with flushing of the wounds in gingiva has shown promising results without any surgical intervention.<sup>29</sup>

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