Extensive gingival myiasis - Diagnosis, treatment, and prevention

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ABSTRACT
Myiasis is a rare disease primarily caused by infestation of tissue by larvae of houseflies. 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. Here we report a case of extensive gingival myiasis, in an 81-year-old female patient, diagnosed and treated successfully in our department. The case is discussed in relation to its clinical presentation, etiopathogenesis, management, and prognosis.

Key words: Gingiva, larvae, necrosis, oral myiasis, parasitic infection

CASE REPORT
An 81-year-old female was brought to our department with the chief complaint being “bugs coming out of the mouth since past 3-4 days.” She appeared undernourished and revealed no contributary medical history. Her vitals and routine blood examination results were well within acceptable limits.

She had a Class II overjet making the lips incompetent [Figure 1]. Clinical examination revealed poor oral hygiene, foul odor and advanced periodontitis. A huge pocket with a hollow space was seen on the palatal aspect of the protruded incisor teeth. On closer examination, the tunnel-shaped orifice had deeper areas showing pulsatile movements probably due to the movement of larvae. The adjacent gingiva appeared erythematous and necrotic. The interdental areas of the adjacent mobile teeth revealed several additional orifices with larvae showing wriggling movement. Provisional diagnosis of gingival myiasis was arrived at correlating the history and clinical examination findings.
The treatment plan aimed at encouraging the larvae to come out of the area. A cotton pellet soaked in turpentine oil was applied a few times and wound surgically explored. Larvae were then grasped and manually removed with the help of tweezers. Over 60 maggots were removed on the first day [Figure 2]. Further supportive care was given on an inpatient basis. Larvae were removed daily manually as described above. On the third day, when the infection was controlled, mobile teeth were extracted [Figure 3] and the wound was debrided of necrotic tissue. The involved site was examined for any remaining larvae before it was sutured with 3-0 silk. The patient was evaluated the next day, and discharged from care on showing significant improvement in her condition. One week follow-up showed good healing [Figure 4].

**DISCUSSION**

Myiasis is a rare condition in human beings although frequently reported in vertebrate animals, main parasites being flies of order of diptera (maggots) which feed on the host’s dead or living tissue. In this condition the soft tissue parts of oral cavity are invaded by parasitic larvae of these flies. Hope et al.,[6] described the first incidence of this parasitosis in 1840, common infestations being reported in open wounds and dead tissues but cavities such as ears, nose, and oral cavity may be involved.[7]

Male predilection of occurrence has been noted in most literatures because of their more outdoor activities and neglecting the oral hygiene when compared to the female counterpart. Oral myiasis are commonly seen in adults and old age but intestinal lesions have been reported in a 8-year-old girl.[9] An anatomical classification can be made as cutaneous myiasis, myiasis of external orifices involving aural, ocular, nasal, oral, vaginal openings, or myiasis involving internal organs such as intestine or urinary tract.[9] Some found that these lesions may be caused by larvae that feeds on living tissue (biontophogas) or those that feeds on dead and necrotic tissues (necrobiontophogas) and categorised as primary and secondary myiasis, respectively.

This parasitic infestation commonly seen in, mouth breathers, alcoholism, senility, in oral and maxillofacial traumas or in old age groups especially mentally handicapped persons.[10] Low socioeconomic status, immunocompromised state, debilitated, and unhygienic living conditions may also
act as predisposing factors.\[^{[11]}\] In our case there are two possible reasons due to which the patient had this rare infestation. In the first scenario, the patient had periodontitis and was not capable of keeping her mouth closed and of protecting herself from flies; subsequently deposited eggs at the gingival pockets. In the second scenario, the female flies deposited eggs in healthy gingiva and periodontitis developed as a secondary event because of the irritation caused by the maggot infestation. In both cases, poor oral hygiene might have played a role in attracting the female flies, and the lack of self-care ability and communication capacity might have led to late presentation.

Oral myiasis are parasitic entity mainly seen in tropical countries like India because of warm and humid environment that aids their breeding.\[^{[12]}\] Maggot infestations may occur in humans in two ways- either by direct inoculation in to wounds or by ingestion of infected materials like meat. Larval development of these flies requires an animal on human intermediate host. These gravid female flies colonize in fresh open wounds and deposit her eggs. These eggs subsequently gain entrance to deeper tissue by local tissue destruction following release of collagenase enzyme and finds a safer place there to pupate. These eggs are hatched within less than one week depending on the external temperature. Larval growth causes progressive destruction and cavitation and finally a fibrous capsule is formed to which they firmly adheres and cause ample difficulty in dissection during surgery. Total number of developing larvae depends on number of eggs laid in host tissue which again depends on severity of tissue destruction, severe infestation may be fatal if it occurs in nose, eyes or ear. Number of larvae obtained from present case ranges from 60 to 70.

Usually, the maggots are seen intraorally in relation to maxillary and mandibular anterior arches by direct infestations, which are precipitated by open mouth sleeping habit or poor oral hygiene. Clinically, the adjacent tissues may be inflamed with or without ulceration, but in this case the patient presented without any ulcer but complained of flies coming out of her mouth which is a rare presentation. Poor oral hygiene, lack of manual dexterity, lip incompetence, open bite and residence in a rural area were considered to be predisposing factors for larval infestation in this patient. It was predicted that the flies were attracted to the bad mouth odor due to neglected oral hygiene or fermenting food debris, making our patient a prime target for this disease. In addition, the patient had incompetent lips with a cl II overjet, which could be thought of as a contributing factor to his neglected oral hygiene. Being photophobic, they tend to hide in deeper tissues, which also acts as a suitable niche for their pupation. Extraction wounds, suppurative lesions, and fungating carcinomas may sometimes be seen as pulsating because of larval movement. Infestations most often seen subcutaneously may produce a furunculoid or boil-like lesion also known as berne. The condition can be completely benign and asymptomatic, and result in mild to acute pain. But the primary concern lies in discomfort due to fungating larvae and unesthetic appearance.

Diagnosis of oral myiasis is usually made by clinical picture of pulsating larvae. The traditional management of oral myiasis is mechanical removal using hemostats or ordinary clinical pincers. Larvae rupture must be avoided. When there are multiple larvae, extensive tissue destruction or in advanced stage of development of larva as in the present case, adjuvant measures like treating the area with ether or comparable solvents are advocated in literatures, which irritates the maggots causing larval asphyxia and forcing them out of their hiding place. Local application of several substances such as oil of turpentine, mineral oil, ether, chloroform, ethyl chloride, mercuric chloride, creosote, saline, phenol, calomel, olive oil, iodoform, can be used to ensure complete removal of all larvae. Nutritional support of the patient with multi vitamin tablets and treatment of secondary bacterial infection in surrounding skin with antibiotics was mandatory in our line of treatment. Commonly used antibiotic regimen may include ampicillin, amoxicillin or metronidazole. Ivermectin, a macrolide that is activated by gamma amino butyric acid liberation, leads to parasitic death and their spontaneous elimination by washing out larvae has been found out to be effective in humans.\[^{[13-15]}\]

CONCLUSION

Every human being is the author of his own health or disease. As always said “prevention is better than cure,” these parasitic infestations can be reduced by raising the quality of life and improving personal cleanliness measurements as they seldom occurs in healthy individuals. Controlling fly population and by maintaining good oral and personal hygiene requires prior importance. Special needs patients include patients with mental and/or physical disability. Most of these patients have difficulties in maintaining good oral hygiene due to poor manual dexterity. Parents/guardians are too busy concentrating on the patients’ social or other health aspects and may not be aware of the importance of oral hygiene or may be having difficulty in gaining access to a dental clinic. It is our duty as dentists to make them aware that a special needs patient should be exposed to the dental intervention as early as possible to promote co-operation and confidence and to prevent disease.

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