Nosocomial Oral Myiasis—A Rare Case Report
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ABSTRACT
Nosocomial oral myiasis, though a rare entity, do occur under certain circumstances. Early diagnosis and treatment of such conditions prevent further damage/complication, especially in patients who are in intensive care. Dentists, in co-ordination with other medical faculty, play an important role in managing such infections. Further, a greater emphasis should be paid for maintaining better hygiene in public places and in the vicinity of the hospital. This paper is an attempt to illustrate the rare occurrence of oral myiasis that was hospital acquired. Only one case has been reported till now following a search through pubmed.

KEYWORDS: Oral myiasis, Nosocomial, Intraoral intubation, Palate, Hospitalisation, Maggot, Dipterous larvae.

INTRODUCTION
Hospitalisation for any healthcare conditions brings associated risks, including risk of infection. Those infections that become clinically evident after 48 h of hospitalisation are considered to be nosocomial infection[1].

Myiasis is the infestation of human vertebrate animals with dipterous larvae, which feed on the host’s dead or living tissues, liquid body substances or ingested food. Maggots can infest any organ or tissue accessible to fly oviposition. Most cases probably occur with the female fly depositing either eggs or larvae on the necrotic tissue, open wounds and unbroken skin or mucosa of an animal or a human host[2,3]. Such invasions may be benign in effect, asymptomatic, may result in mild to violent disturbances or even death[3,4]. Myiasis occurs mainly in the tropics and is associated with inadequate public and personal hygiene. Removal of maggots is the most prudent treatment and must be adapted as soon as possible to prevent further tissue damage and bacterial infection[3].

CASE REPORT
A male patient aged 33 years was brought to the emergency unit following suicide attempt. After admission, the patient was intubated with an oro-gastric tube and gastric washing was carried out. The floor of the mouth was packed with gauze to absorb any secretions during regurgitation. The patient was then shifted to the intensive care unit and was on ventilator support.

After 5 days of hospitalisation, foul smell was noticed originating from the oral cavity of the patient. On thorough examination, maggots were seen on the palate around the intubation pipe. They were picked with forceps and around 30 maggots were removed from the lesion. The wound was then washed with turpentine oil and saline to remove any of the remaining maggots. The procedure was carried out for 4 consecutive days after which no maggots were recovered from the wound. The

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patient was then discharged after getting an opinion from both the physician and the dentist.

DISCUSSION

Myiasis is a worldwide phenomenon, the prevalence of which is related to the latitude and the life cycle of various species of flies. The term ‘myiasis’ was introduced by Hope in 1840, and the most widely accepted definition is that proposed by Frederick Zumpt in 1965, which says: “The infestation of live human and vertebrate animals with dipterous larvae, which atleast for a period, feed on the host’s dead or living tissue, liquid body substances or ingested food”[5,6]. Oral myiasis was first described by Lawrence in 1909[7].

The incidence is higher in the tropical and subtropical zones. The flies responsible for the condition prefer a warm and humid environment and therefore myiasis is restricted to the summer months in the temperate zones, while it is observed all year round in the tropics[8]. Raichur, being situated in the tropical region, is hot all round the year and oral myiasis is not an uncommon phenomenon in this place. This could be owed to the low socio-economic status and poor infrastructure, and also the unhygienic living conditions. The cases go unnoticed or are not published. However, the uniqueness of the present case is that myiasis occurred in a non-ambulatory patient under ventilator with gastric tube and was hospital acquired.

The most common fly larvae in human myiasis belong to the family Sarcophagidae or Calliphoridae, whereas their genera are many and varied and include Calliphora, Lucilia, Musca, Phormia, Sarcophaga, Wohlfahrtia, Hypoderma, Gasterophilus, Dermatobia, Callitroga, Cochliomyia, Cordylobia and Chrysomya[8]. Species identification is essential to help clinicians to predict the patient’s outcome. The differences between the various species of the fly larvae, as they relate to their ability to invade tissue and restriction on the host selection, may influence the clinical outcome. The larval stage of some fly species has been shown to be exceptionally aggressive[9]. However, no attempt was made in the present situation to identify the species of the larvae.

The larvae either feed on the living tissues (biontophagas) or on the dead and necrotic tissue (necrobiontophagas). Myiasis is categorised as primary and secondary myiasis, respectively[10]. According to the tropism of the tissue, dipterous larvae are divided into cutaneous and subcutaneous myiasis, myiasis of natural cavities, and myiasis with inner migration[11]. Depending on the condition of the involved tissue, myiasis can be classified into the following three categories:

- Accidental myiasis – when the larvae are ingested along with the food
- Semispecific myiasis - when the larvae are laid on the necrotic tissue of the wound
- Obligatory myiasis – when the larvae affect the undamaged skin[12].

Oral myiasis is considered to be rare owing to the fact that oral cavity rarely provides a favourable site for the infestation and harbouring of the larvae. Conditions leading to persistent mouth opening, along with poor oral hygiene, suppurative lesions, severe halitosis and facial trauma, may predispose the patient to oral myiasis. It is also been reported among epilepsy patients with lacerated lips following seizure, in those with incompetent lips and thumb sucking habit, advanced periodontal destruction, tooth extraction sites, fungating carcinoma of the buccal mucosa and in patients with tetanus. Low socioeconomic status, immunocompromised state, debilitated and unhygienic living conditions may act as predisposing factors.

Oral myiases are parasitic entities mainly seen in tropical countries like India because of the warm and humid environment that aids in their breeding. The gravid female flies colonise in fresh open wounds and deposit eggs. They lay more than 2800 eggs, in batches of 10-400 eggs, and the incubation period ranges from 11 to 21 h. The larval feeding period ranges from 3.5 to 4.5 days or more. The eggs subsequently enter the deeper tissues by local tissue destruction following the release of collag enase enzymes and find a safe place to pupate. The eggs hatch within a week, depending on the external temperature. The larval growth causes progressive destruction and cavitation, and finally,
a fibrous capsule is formed to which they firmly adhere and cause ample difficulty in dissection during surgery[3].

Hospitalisation for acute illness, chronic care, trauma or other healthcare conditions is a common occurrence. Hospitalisation brings associated risks, including risk of infection. Nosocomial infections are estimated to occur in 5% of all acute care hospitalisation. Such infections have been identified as one of the most serious patient safety issues in healthcare.

In a study of human myiasis in Hong Kong, carried out from 2002 to 2009 by Dr Tam from the Department of Health, the oral cavity was found to be the most affected site with myiasis in non-ambulatory patients with nasogastric feeding tube[8]. In the case that we have presented here, the patient was in intensive care unit on ventilation and with a gastric tube[13].

Nosocomial myiasis is sometimes attributed to poor general hygiene in the hospital facility. However, it is an underestimation of the infections and parasitic risks faced by a category of particularly sensitive patients with suppurative or necrotic wounds. The onset of myiasis in patients recovering from various ailments in hospitals is usually viewed negatively and perceived as a sign of inadequate hygiene, which can result in the hospital risking litigation. For this reason, as well as ensuring the well-being of the patients, adequate preventive measures must be taken in patients who are more susceptible[5].

To prevent myiasis, good personal and environmental hygiene is of paramount importance. Regular screening of the dependent’s oral cavity, especially on nasogastric tube feeding, is crucial for early detection or infestation and treatment. Fly proofing measures, such as installation of window screening, insect electrocuting devices or fly trap, should be considered[13]. Prevention of nosocomial myiasis could require controlling fly populations in the hospital environment by efficient sanitary and waste disposal, reducing odours of decomposition and more radical approaches such as insecticide sprays. Other preventive measures include protection of the patients at risk by physical barriers such as screens or sealed windows and attention to the hygiene of the patients[9].

Removal of the larvae is the most prudent form of treatment. Various substances[8] are used to force the larvae out from the deeper tissue. Local application of substances like oil of turpentine, mineral oil, ether, chloroform, ethyl chloride, mercuric chloride, creosote, saline, phenol, calomel, olive oil and iodoform can be used to remove the larvae. This is followed by an antibiotic regimen. Commonly used regimen may include ampicillin, amoxicillin or metronidazole. Ivermectin, a macrolide that is activated by gamma amino butyric acid liberation, leads to parasitic death[14].

Despite frequently being associated with dirty environment, the maggots can be used therapeutically to debride and enhance healing in chronic wounds such as the pressure ulcers and venous stasis ulcer. The maggots clear the dead and necrotic tissue and at the same time secrete allantoin, which promotes healing[15].

**CONCLUSION**

There are so many urgent, life threatening events taking priority over everything else that making sure to get back to basic mouth cleaning often seems like just an unnecessary task. Nosocomial oral myiasis, though a rare entity, does occur frequently in the remote areas where not much attention is paid at maintaining hygiene. This article puts emphasis on the identification of such cases and throws some light on the importance of maintenance of personal and public hygiene by creating awareness in the minds of the public.

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