



TRACHEOSTOMAL MYIASIS: A CASE REPORT AND REVIEW OF LITERATURE

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ABSTRACT

Myiasis is the invasion of tissues and organs of human beings or other vertebrates by fly larvae. This phenomenon is well documented in the skin, especially among animals and people in tropical and subtropical areas. When tissues of the oral cavity are invaded by the parasitic larvae of flies, this condition is called oral myiasis. Oral myiasis is a rare condition that can be caused by several species of dipteran fly larvae and may be secondary to serious medical conditions. We hereby report a rare case of oral myiasis involving the palate in a 58-year-old diabetic patient and discuss the management of the same. "Myiasis" is considered in Hindu mythology as "God's punishment for sinners." It is known to infest live human or animal tissue. Literature abounds with reports of myiasis affecting the nasal cavity, ear, nonhealing ulcers, exophytic malignant growth, and cutaneous tissue. But report of myiasis of the tracheal stoma is rare. Only a few cases of tracheal myiasis have been reported in literature. We report a case of tracheostomal myiasis in an elderly male.

KEYWORDS

Tracheostome, myiasis, prevention.

INTRODUCTION

Myiasis ("myi = fly") is an infectious disease caused by invasion of vital and/or necrotic tissues by larvae of houseflies.¹ The term "myiasis" was coined by Hope (1840) and oral myiasis by Laurence (1909).² tracheostomy myiasis is very rare with few cases reported in literature.^{3,4} One of the earliest reports was from Soares "d" Souza (1587) who reported a case of cutaneous myiasis.⁵ In 1840, Rev F. W. Hope coined the term "myiasis" (earlier known as scholechiasis). Castellani and Chalmer's (1919) described nasal myiasis caused by chrysomya 5 known as Peenash in India. Myiasis infesting various parts of the body abounds in the literature;

Myiasis is the invasion or infestation of tissues and organs of human beings by fly larvae.⁶ Larvae feed on living or dead host tissue for certain period of time. They may infest different parts of the body as seen in cutaneous, nasopharyngeal, aural, ocular (ophthalmomyiasis), wound, intestinal and urogenital myiasis.⁷ Myiasis can be caused by several species;

The three main families of flies involved in myiasis are the Calliphoridae (timbu flies, screwworms, green bottles and bluebottles), Sarcophagidae (flesh fly) and Oestridae (warble flies and bottlefly). Larvae of the common housefly, musca domestica have also been identified especially in neglected wounds. The common housefly is found worldwide. Its life cycle is similar to that of the Calliphoridae flies. The infestation of already existing wounds is referred to as traumatic myiasis.⁸

There are two forms of myiasis:

Obligatory, where the maggots require living tissues for larval development,⁹ and facultative, where flies opportunistically use necrotic wounds as a site in which to oviposit and incubate their larvae.⁹

CASE REPORT:

60 years male with 7 internal diameter size tracheostomy tube in situ

presented to our department with complaint of bleeding from tracheostomy site. Patient is diagnosed case of squamous cell carcinoma glottis one year back. Patient did not take any treatment. Patient was discharged from our ward after advising for care of tracheostomy tube and site. But patient did not comply with instructions. He did not come for follow up. When patient came he presented with bleeding. On examination of tracheostomy site, maggots were seen. The stomal hygiene was poor.

Under aseptic conditions stoma was cleaned, maggots were removed. On first day around 70 maggots were removed. Turpentine oil was used. Every day twice mechanical removal of maggots was done. On 4th day after admission site was free of maggots





DISCUSSION

Reports have appeared in the literature regarding nasal, auricular or oral myiasis but myiasis related to tracheostomy is a very rare event with only two publications having appeared in the English literature 10,11 . Myiasis was considered, by Hindu mythology, as “God’s punishment of sinners”.

Zumpt (1965) defined “myiasis” as “the infestation of live human and vertebrae animals with dipterous larvae, which at least for certain period feeds on the host’s dead or living tissue liquid body substances, or ingested food.” Myiasis causing larvae is either an obligate parasite or a facultative parasites 12,13,14. Dipterous larvae in the obligate group develop in living tissue of the host, and this is a necessary part of their life cycle. In contrast, facultative group consists of species that are free living, feeding on decaying material, that is, animal carcasses 14.

Predisposing factors could be: 1. smaller dimension of percutaneous tracheostomy in comparison to surgical tracheostomy; 2. persistent vegetative state; 3. poor hygiene of outer and inner cannula; 4. odours of decomposition, which attract flies; 5. living in a rural area. Chigusa et al.3 (1996) indicated that patients with psychiatric disorders, as well as elderly and debilitated persons, should be protected from flies, on account of their autism and/or decreased sensitivity, which may make it easy for flies to deposit eggs or larvae on the patient’s body surface or orifices . Myiasis of tracheostomy could be considered a particular variety of cutaneous or a cavity myiasis because the stoma is a transition area between the skin and the tracheal cavity.

Lucilia Caesar is a common fly in Europe, of medium size (8-12 mm), green metallic, part of the Muscidae family, order of dipterous. The adult fly can be found feeding on flowers, cadavers, excrements and waste, for this it is vector of different pathogens. The adult females lay the eggs on the cadavers, wounds or sores and are attracted by the foul smell emanating from infected wounds; these eggs hatch giving rise to primary larvae which can progress by burrowing through necrotic or healthy tissue using a pair of mandibular hooks aided by proteolytic enzymes. The mature larva (third stage), in the case described herein, was whitish in colour, legless, with a cylindrical body, 14-18 mm in length. The head (pseudoccephalon) was small, retractile and presented 2 coneshaped antennae and 2 mandibular hooks. The skin was hard, thick and yellowish-white. In the posterior part of the larva, the microbiologist observed the 2 external openings of the respiratory system, called “stigma”, which are important for correct species diagnosis. 15. The patient usually presents due to pain, swelling and discomfort 16.

We could find only a handful of cases reported in literature. In one case, the myiasis was secondary to an aspirated foreign body via the

tracheostomy tube lodged in the intrathoracic trachea 18. Two cases have been reported in patients who had a tracheostomy for thyroid malignancy 19,20. Others have reported myiasis around the tracheostoma in a patient who was in persistent vegetative state 12,21. Myiasis is diagnosed clinically based on presence of the parasitic maggots of flies

The main stay of treatment is removal of maggots with thorough wound debridement along with management of systemic a comorbid illness. Larvae can also be killed by applying proper insecticides to the infected areas and making sure the wounds are properly dressed.22 When tissue destruction is present surgical exploration should be carried out complemented by treating the defect with either or a comparable solvent like turpentine oil, iodoform, chloroform, ethylchloride, etc capable of irritating the parasites and forcing them out of hiding 8.

Oral treatment of human myiasis is based on anecdotal reports, and most of the experience comes from veterinary medicine. Ivermectin, a semisynthetic agent of the macrolide family (derived from a natural substance, avermectin, which is obtained from actinomycetes) is the most common agent used for the treatment of myiasis23

Another method that has been tried is the use of single dose of subcutaneous ivermectin (200 microgram/kg) or doramectin (200 microgram/ kg), which prevents strike and restrike of treated wounds 24,25,26. Risks of use of organophosphorous compounds for tracheostomy wound myiasis is high and hence not used.

PREVENTION

Poor sanitation is probably the most important risk factor for human myiasis. Low socioeconomic status, especially in poor countries, has an intimate relationship with the lack of basic sanitation and inadequate garbage disposal, leaving organic material exposed, which attracts insects and small animals, creating a sustainable cycle of filth. Adequate sanitation can be reached only when government, population, and education programs work together.

Individual actions should also be implemented and include emptying and steam cleaning dumpsters on a regular schedule, washing food and making a visual inspection of the food before consumption, storing food in adequate receptacles, making sure wounds are cleaned and dressed regularly, and more. Good sanitation can avert many myiasis cases. In regions of endemicity, sleeping nude, outdoors, and on the floor should be avoided. Appropriate precautions will help avoid infestations. The use of screens and mosquito nets is essential to prevent flies from reaching the skin. *D. hominis* infestation may be thwarted by the application of insect repellents containing diethyltoluamide (DEET).²⁷

Drying clothes in bright sunlight and ironing them are effective methods of destroying occult eggs laid in clothing, especially by *C. anthropophaga* . Other general precautions include wearing long-sleeved clothing, covering wounds, and avoiding falling asleep outdoors. Field control of flies is extremely important. All available methods should be used, including aerial sprays, destruction of animal carcasses, elementary sanitary and hygiene practices, and clearing of debris and rubbish near houses. The inactivation of females by the release of large numbers of males previously sterilized by ionizing radiation has been highly successful. Reports on the control of *Cochliomyia* infestation in sheep with the use of ivermectin, which has been reported to be 100% effective in controlling existing infestations and as a prophylaxis

We need to be aware of a few problems that can occur with maggots around the tracheostomy tube. Aspiration of the maggots themselves is a major concern causing airway obstruction and aspiration pneumonia. Aggressive nonjudicious removal of maggots in the neck can also damage the major blood vessels of the neck (carotid artery and jugular vein) causing torrential bleeding. Embolisation of maggots via the blood vessels is an expected complication too, causing thrombosis of the adjoining vessel.

MAGGOTS THERAPY

Maggot therapy is essentially an artificially induced myiasis performed in a controlled environment by experienced medical practitioners. The selection of a suitable fly species for use in maggot therapy is of paramount importance, as it determines both the safety

and success of the treatment. It is imperative to select a species that feeds almost exclusively on necrotic tissue. *L. Sericat* is considered the most suitable species for maggot therapy. The larvae must be prepared and maintained sterile before clinical use²⁸.

Maggot therapy has the following three core beneficial effects on a wound: debridement, disinfection, and enhanced healing. Debridement is the removal of cellular debris and nonviable necrotic tissue from the wound bed. The removal of necrotic tissue, which acts as a microbial substrate, may also reduce the risk of infection. Maggots debride wounds quickly and effectively, without damage to viable tissue. Maggots are photophobic and will naturally move into the deep crevices that may be beyond the reach of a surgeon's scalpel. Reports have been published marvelling at the benefits of maggot debridement therapy (MDT) in all sorts of wounds.

Several mechanisms have been suggested for disinfection, including the simple mechanical irrigation of the wound by increased secretions/excretions produced by larvae, the action of the midgut commensal *Proteus mirabilis* on digested bacteria, and the elimination of antibacterial products from living maggots.

Enhanced healing is started by the proteolytic digestion of necrotic tissue and disinfection promoted by the maggots. Second, researchers have suggested that maggots exhibit other, more direct mechanisms that contribute to the enhanced healing of wounds, although these mechanisms are not completely understood.

Allantoin (2,5-dioxo-4-imidazolidinyl urea) or ammonia bicarbonate could be responsible for the abundant growth of granulation tissue. The growth-stimulating effects of alimentary secretions and hemolymph from the blow fly *P. sericata* on human fibroblast tissue may also contribute to enhanced healing^{28,29}

CONCLUSION:

It is important to proceed with identification of the larvae, distinguishing them from other types of myiasis involving different therapeutic implications.

The present case of myiasis is described in order to remind the ENT specialist to bear the diagnosis of this disorder in mind. Though infestation of the tracheostoma with maggots is rare, such a possibility exists. Otorhinolaryngologists need to be aware of this condition. We emphasize the importance of health education in home tracheostomy tube care to the patient and his family which will go a long way in preventing such an adverse event from occurring.

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