CASE REPORT:

MYIASIS CAUSED BY *LUCILIA CUPRINA* IN AN ADULT PATIENT IN KELANTAN, MALAYSIA

Murnihayati Hassan[1], Liszen Tang[2,3], Azlinda Abu Bakar[1], Zeti Norfidiyati Salmuna@Ayub[1,2], Tengku Nurfara'ain Qistina Tuan Kamarul Baharin[2,3], Nazni Wasi Ahmad[4] and Zakuan Zainy Deris[1,2]

[1]Department of Medical Microbiology and Parasitology, School of Medical Sciences, Universiti Sains Malaysia Health Campus, Kubang Kerian; [2]Hospital Universiti Sains Malaysia (Hospital USM), Kubang Kerian; [3]Oral and Maxillofacial Surgery Unit, School of Dental Sciences, Health Campus, Universiti Sains Malaysia, Kubang Kerian Kota Bharu, Kelantan; [4]Entomology Department, Institute for Medical Research, Kuala Lumpur, Malaysia

Abstract. *Lucilia cuprina* is a rare cause of serious myiasis. We reported here a case of a 51-year old Malay male with an underlying history of stroke causing him to be bed ridden; he had a tracheostomy and a Ryle's feeding tube. His oral care had been neglected. His caregiver noted a foul oral odor and the presence of maggots on tracheostomy suction. On physical examination, the patient was febrile. On oral examination, he had periodontitis, multiple mobile teeth and oral myiasis. He was treated with removal of all 153 larvae, given intravenous cefuroxime and wound care. The larvae was identified as those of *Lucilia cuprina*. At follow-up three months post-operatively, the myiasis and periodontitis had resolved completely without residuals. *Lucilia cuprina* can cause severe myiasis in disabled patients but good hygiene and appropriate wound care can treat this condition.

Keywords: myiasis, *Lucilia cuprina*, blow flies, maggots

INTRODUCTION

Lucilia cuprina (Insecta, Diptera, Calliphoridae), also known as the Australian sheep blowfly, can cause sheepstrike, a fatal form of myiasis affecting living sheep (Li *et al*, 2014). Dipteran flies have been found in decomposing cadaver and are used to estimate the time of death (Ahmad and Ahmad, 2009; Azmi and Lim, 2013).

Diptheran flies lay eggs on carrion, dung, decomposing carcasses and on the open wound of mammals that eventually lead to myiasis (Francesconi and Lupi, 2012; Levot and Casburn, 2016). Myiasis may also infest healthy tissues causing serious complication, such as ophthalmomyiasis and cerebral myiasis (Francesconi and Lupi, 2012). The larvae are often removed surgically, but occasionally ivermectin is used to prevent larval penetration to surrounding

Correspondence: Dr Liszen Tang, Oral & Maxillofacial Surgery Unit, School of Dental Sciences, Health Campus, Universiti Sains Malaysia Kubang Kerian, 16150 Kota Bharu, Kelantan, Malaysia.
Tel: +60136475688; Fax: +609 767 5505
E-mail: drliszen@usm.my

healthy tissue. We report here a case of oral myiasis in a disabled stroke patient from eastern coast of peninsular Malaysia.

CASE REPORT

The patient was a 51-year-old Malay male, bed-ridden post-stroke, with a permanent tracheostomy and Ryle's tube feeding. He is verbally and physically disable and his oral hygiene was neglected. The patient lived in a rural sandy area surrounded by coconut plantations and domestic animals, including poultry and cattle. The caregiver noted a foul mouth odor for two days prior to seeking medical attention. Upon tracheostomy suction at home the caregiver reported finding maggots. Upon presentation to the Emergency Department, the patient was febrile with a temperature of 38.9°C. On oral examination, the patient had inflammation of gingival tissue with multiple mobile teeth and retained roots. On the hard palate extending to soft palate and in the bilateral buccal sulci there were numerous maggots (Fig 1). The rest of the physical examination was unremarkable for other complication of myiasis. On laboratory testing, the patient had a total white count of 18.5×10^6/ml with 90.3% of neutrophils. The patient was treated with cefuroxime 750 mg three times daily and he underwent removal of the maggots wound care under general anesthesia (Fig 2). After removal of the maggots, 11 mobile teeth were also removed. A total of 153 maggots were removed during the procedure. After the maggot removal, it was discovered the anterior third of the palatal mucosa had been ingested by the maggots exposing the palatal bone. The exposed palatal bone was covered with a periodontal Coe-Pak eugenol-free dressing that was changed every three days. Oral chlorhexidine solution was then used to flush the lesions three times daily. The patient was discharged home after wound resolution and the caregiver was educated about oral care. At 3-month follow-up, the palatal mucosa had healed completely without any residuals or signs of myiasis. The larvae were sent to the Medical Entomology Unit, Institute for Medical Research, Kuala Lumpur for identification and determined by morphology to be *Lucilia cuprina* larvae.

DISCUSSION

Primary myiasis occurs when larvae

Fig 1-Numerous maggots can be seen at bilateral buccal sulci and hard palate extending to soft palate region.

Fig 2-Removal of maggots wound care under general anesthesia.

feed on the living tissue of a living host and secondary myiasis is when larvae feed on necrotic tissue (Francesconi and Lupi, 2012). Myiasis can be classified as 1) accidental myiasis, in which larvae are accidentally ingested; 2) semi-specific myiasis, in which larvae infest necrotic tissue; 3) obligatory myiasis, in which larvae infest living tissue (Reddy *et al*, 2012). Myiasis can also be classified by the body part infested, such as cutaneous, internal organ, external orifice and generalized myiasis (Francesconi and Lupi, 2012). Oral myiasis is rarer than cutaneous myiasis as the oral tissue since it is a more difficult location for female fly to lay its eggs (Sharma, 2012).

The adult *Lucilia cuprina* fly has a characteristic metallic /bronze color with an average size of 9 mm but can grow up to 13 mm in length depending on the amount of food consumed (Levot and Casburn, 2016). Carbohydrates are the primary source of energy for both male and female flies; these include plant blossoms and nectar; especially in female flies where reproductive potential is determined by food they consumed (Levot and Casburn, 2016). A female fly needs to consume a protein rich meal prior to mating with a male fly. In contrast, the male fly is reproductively matured from the time they emerged from the soil (Levot and Casburn, 2016).

Lucilia sericata and *Lucilia cuprina* have been used for maggot debridement therapy (MDT), mainly to treat diabetic foot ulcers (Paul *et al*, 2009). MDT is usually considered safe since larvae usually only feed on necrotic tissue (Paul *et al*, 2009). However, *Lucilia sericata* has also been reported to cause myiasis in healthy tissue (Sherman *et al*, 2000; Cavusoglu *et a*l, 2009; Paul *et al*, 2009). *L. cuprina* has also been reported to cause myiasis in Australia and it has been reported to cause a greater incidence of myiasis in subtropical parts of Australia than *L. sericata* (Lukin, 1989).

Host odors attracted female flies, then they lay eggs on the parts of the skin with high humidity and on mucosal surfaces (Sharma, 2012). A female can lay up to 250 eggs per lay (Levot and Casburn, 2016). The eggs hatch within 8 to 72 hours (Levot and Casburn, 2016). Myiasis causes tissue damage due to the mechanical effect of eight hours and three days. Tissue damage happens due to the mechanical effect of larval feeding and the chemical effect of a protease released by the larvae (Tellam and Bowles, 1997; Sandeman *et al*, 2014; Levot and Casburn, 2016).

Several factors are associated with oral myiasis, including poor oral hygiene, an inactive or paralysed patients with an underlying medical illness (including diabetes, stroke patient and having a chronic wound) and living in tropical and subtropical areas (Sharma, 2012). Often a patient with myiasis is unable to physically ward off flies from settling on their body (CDC, 2003; Jang, 2013).

Myiasis may also occur in the ICU (Nazni *et al*, 2011). The US Centers for Disease Control and Prevention (CDC) has developed a guideline to prevent infestation of anthropods in ICU patients (Mielke, 1997; CDC, 2003). Recommended measures include installation of window screens and fly electrocuters (Lukin, 1989; Nazni *et al*, 2011). Other methods for reducing the risk for myiasis in health facilities include removal of potential food sources, eliminating potential habitats, oral toilet of unconscious patients and appropriate wound dressings (Bruesch, 1994). A pest control service can also provide pest-control using approved physical and chemical methods (CDC, 2003).

Caregivers looking after incapacitated

patients should be made aware of the risk of myiasis and be educated about appropriate oral hygiene care such as daily oral toilet, skin and wound inspections. These inspections will allow early detection of myiasis. Healthcare workers should educate caregivers about myiasis risk and prevention methods for those who care for at risk patients. In conclusion, myiasis can cause disease in patients with predisposing factors. Caregivers of at risk patients should be thought preventive methods on oral hygiene care which is important to prevent such debilitating outcomes.

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