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Case report

Maggots in oral cancer infested with larvae, and use of turpentine oil as a therapeutic measure

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ABSTRACT

Although oral myiasis is a rare condition in non-tropical countries comparing to those in tropical zone, the manifestation of myiasis could not be overlooked, especially among oral cancer patients who are unable to keep their mouth closed and maintain good oral hygiene. The diagnosis of myiasis is confirmed clinically by detecting the maggots and traditional management of mechanical removal of the larvae by using turpentine oil has been observed. The houseflies may carry larvae (maggots) and lay them down on exposed wounds. In this case an intruding oral cancer spreading through facial skin not covered with a surgical dressing was infested into larvae, and caused myiasis. Local application of turpentine oil was utilized to eliminate maggots but the procedure carries a risk of toxicity.

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1. Case

A 56-year-old female (Fig. 1) attended the Oral & Maxillofacial Surgery Department of AB Shetty Memorial Institute of Dental Sciences – Nitte University, located in the sub-urban area of Mangalore city – of Karnataka state in India. The patient complained of a persistent ulcerated lump on her left cheek which had been present for more than six months. She had difficulty whilst chewing food and a foul smell. The ulcer on left buccal cheek measuring over 4 cm, with regional nodal spread was classified as T4N2aM0. A biopsy confirmed the case of squamous cell carcinoma. She had a history of betel quid chewing for more than 30 years, used 15 times a day. Patient declined surgical treatment or any palliative therapy offered. She returned back to the medical emergency unit with a fulminating growth. The ulcer by then had spread to her entire left cheek causing tissue destruction (Fig. 1), had high fever and respiratory distress. She had a chest X-ray found clear. She was admitted to the hospital and treated with antibiotic and analgesics.

After 7 days of her admission, her general medical condition settled. This time she was willing to receive ablation treatment of her tumor. The patient was reviewed by the joint surgical oncology and ablative surgery was performed after taking informed

consent. An ablative palliative surgery at levels 1A, IIA and III was performed. Therefore, unilateral neck dissection and hemiglossectomy was performed. The surgery produced lateral defects and massive destruction of cheek and lips. Patient developed severe functional and aesthetic impairment. Although the mandible was not resected, the plan for reconstruction was taken. Post-operative surgical specimen was examined – and no particular histopathological features of myiasis were evident except necrosis. There was no early detection of maggots confirmed; only detected at a later stage. After surgical procedure the patient was treated with combined broad-spectrum antibiotics and metronidazole including analgesic, and those were administered through an intravenous line.

On 4th week following surgery maggots were noted on the margin of the surgical wound. The maggots at the wound surface were removed manually with a pair of tweezers from the deeper aspect of exposed tissues, as a measure of eradication of maggots. Turpentine oil was applied onto the affected parts of exposed necrotic tissues. On 5th week onward, application of turpentine was continued twice a day until the wound was cleaned of any maggots. However, after the 6th week the patient's condition was deteriorated and she ultimately succumbed to death into pneumonia.

2. Discussion

Although maggots are used as a cost effective method of wound debridement, but it has not been decided whether the secretions from the maggot used for debridement have any role in bacterial growth or not [1–3]. However, in this case, the maggots were not used for debridement; rather, the maggots were infested by the flies

[☆] AsianAOMS: Asian Association of Oral and Maxillofacial Surgeons; ASOMP: Asian Society of Oral and Maxillofacial Pathology; JSOP: Japanese Society of Oral Pathology; JSOMS: Japanese Society of Oral and Maxillofacial Surgeons; JSOM: Japanese Society of Oral Medicine; JAMI: Japanese Academy of Maxillofacial Implants.

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Fig. 1. A 56-year-old with advanced oral squamous cell carcinoma spreading to face and neck in palliative care unit.

in oral cancer tissue, which is not very common in India, but few cases have been reported about this condition in other sites [4,5]. The early infestation of maggot is asymptomatic, i.e., until the number of maggot and larvae is large in a wound, it is almost invisible, because few early and smaller maggots live in deeper tissue. Patient does not have a complaint of myiasis, for example, there are no typical clinical symptoms like pain, irritation or burning sensation. Only it is diagnosed when it is seen by clinical staff. The patients may complain of maggots when they see or feel a creeper in the wound.

The maggots are pinkish bright brown (Fig. 2) measured 16–18 mm in length and 2–3 mm in width [6,7]. The body of maggot is covered with tough and non-sclerotic integument stripped with dark bands with robust and thorn-like spines. The anterior part showed five fingers like projections. Posterior part of it had a cleft, and the anal segment had three straight slit-like openings with lateral swellings of the sides. The maggots found in this case were identified to the genus *Chrysomya*.

The mode of maggot/larvae infection is spread through the vector-housefly. The flies sit on the open necrotic tissue and infest it



Fig. 2. The maggot.

with maggot larvae. This usually happens when the exposed tissue is not covered with sterile dressings. Covering the exposed necrotic tissue with petroleum jelly or 100% pure turpentine oil may help reduce larvae infestation. Although the application of turpentine oil forces the maggots to come out of deeper layers of skin, it does have other side effects. Some clinicians use a mixture of turpentine and chloroform, but medical literature is sparse on effective therapies.

The procedure of removal of maggots with proper therapeutic agents needs to be addressed. In principle, the maggot infested tissues should be treated without harming the adjacent sound tissue and general health condition of the patient. The potential occupational risk of turpentine cannot also be avoided [8]. This may require biological monitoring with proper sampling of the body fluids of patients exposed to Turpentine and staff members involved in treating such cases [9]. Turpentine is a volatile mixture of hydrocarbon isomers. It is collected from pine-gum or pinewood. Gum turpentine is a yellowish, sticky, opaque, combustible material. Turpentine oil is obtained by distillation of pinewood and is flammable. The oil combined with oxidizing agent (e.g. chlorine – used in dentistry) may cause fire and explosion. Turpentine vapours may generate carbon monoxide. Turpentine is irritant to skin, and mucous membrane. It may also cause skin sensitization and affect the central nervous system, gastrointestinal system and the urinary system. The lowest estimated oral dose reported to be lethal in humans is 441 mg/kg [7]. Exposure to a 75-ppm concentration for 3–5 min irritates the nose and throat, and exposure to a 175-ppm concentration irritates the eyes and may be considered intolerable by human volunteers [5]. Ingestion of turpentine causes a burning pain in the mouth and throat, nausea, vomiting, diarrhoea, abdominal pain, excitement, ataxia, confusion, stupor, seizures, fever and tachycardia, and may also cause death due to respiratory failure [7]. However, the more purified form of turpentine now in use appears to have decreased the incidence of or to have eliminated turpentine-induced nephritis [8,7].

3. Conclusion

The infestation of maggot and its larvae on open wound cannot be ignored in a tropical country, but can be prevented. Restricted mobility of the patient and unprotected exposed necrotic tissue favor the growth of maggots. Maintenance of good oral hygiene, meticulous observations of the wound may help prevent myiasis. Although the treatment is very simple by using anti-larval agents such as turpentine oil or mixture of turpentine oil and chloroform, which is used in India, 0.2% chlorehexidine has been used elsewhere [6]. Turpentine does not kill the larvae, but help maggots to come out from deeply seated necrotic tissue. The risk of complications and any affect on adjacent tissue cannot be ignored. Therefore, in order to avoid any co-morbidity, such as injury to healthy tissues of cancer patient, risks of occupational hazards to the clinical staff, caused by non-therapeutic grade of turpentine – should be a concern. Importantly, the best way to prevent myiasis is to cover the exposed cancer tissue, and better keep close the windows to preventing easy access of the house flies inside the rooms of the lying patients in a hospital, especially in tropical countries.

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