

## Orbital Myiasis (Dermatobia Hominis) Complicating Secondary Squamous Cell Carcinoma of Medial Rectus Muscle

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### Abstract

**Background:** Myiasis is an infestation of living tissue of human and other vertebrate animals by larvae of flies of the order Diptera.

**Aim:** To present a case of destructive squamous cell carcinoma complicated by orbital myiasis.

**Case report:** Here is a rare case report of ocular myiasis from the species sarcophaga in an elderly patient belonging to rural India having neglected secondary squamous cell carcinoma of medial rectus muscle, one month after excision of conjunctival intraepithelial neoplasia. Computerized tomography imaging of orbit and brain revealed multiple bony erosions with intracranial extension. The pathogenesis, clinical presentations, findings of investigations and treatment of orbital myiasis in squamous cell carcinoma are discussed here under.

### Keyword:

Conjunctival intraepithelial neoplasia; Myiasis; Ophthalmomyiasis; Orbit; Rectus muscle; Squamous cell carcinoma

### Introduction

The term myiasis is derived from the greek word “myia” meaning fly [1]. The term was coined by Frederick William Hope in 1840 [2] and defined by Zumpt [3]. It is a pathological condition in which there is infestation of living mammals with the dipterous larvae, which at least for a certain period, feeds on the hosts living or dead tissue and develops as parasite [4]. The parasitic infestation occurs in human and other vertebrate animals and pets like dogs, cats, and cattle’s. Human myiasis is a rare condition that can occur in any part of the world, but more common in warm and humid climates of tropical and subtropical countries [4]. Human myiasis usually occurs in elderly, compromised and mentally disabled individuals often having fungating or necrotic wound. Face is involved in 1% of the cases of myiasis, ocular myiasis being more rare [5].

We report a case of orbital myiasis complicating squamous cell carcinoma of medial rectus muscle by encroaching intracranial space and other surrounding structures.

### Case Report

A 75 year-old male, Muslim, uneducated, belonging to rural background was brought in the month of march 2013 to emergency outpatient department of our teaching hospital with complaints of huge ulcerated wound in right eye and periocular area associated with watering and blood mixed discharge of five months duration. He also complained of itching and worm crawling in the ulcer for last six days. He did not have any past history of significant trauma, insect bite and or any systemic disease like diabetes. Patient was apparently

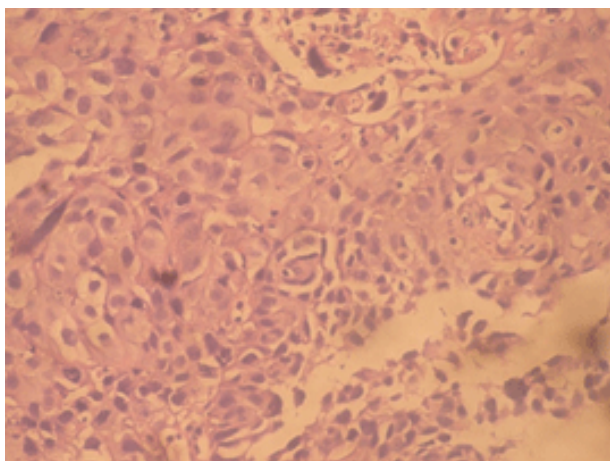
asymptomatic for one year when he was operated for cataract with intraocular lens implantation in private eye hospital and his post-operative best corrected vision was 6/18. He was all right for one month, and then he noticed a small nodular mass in inner side of right eye which was associated with redness and watering. The mass was excised and amniotic membrane graft was transplanted in a private eye hospital. Recurrence was observed in tumor after a month of excision, which gradually progressed since July 2012 and attained the present size. Patient has lost useful vision in the right eye. The reason appears to be not attending or contacting any Ophthalmologist after the excision of tumor.



**Figure1:** Pre-treatment photograph of the patient showing ulcer-nodular mass in right ocular and periocular area with visible maggot in the necrotic base of ulcer with file (Red Arrow) setting at and around the wound. Diffuse swelling in right parotid area.

On examination, there was large fungating, ulcerated mass involving right eye and periocular area, associated with tender diffuse swelling on right side of cheek and forehead. The eye ball could not be seen. There were many yellowish white and shiny maggots crawling in the base of ulcer, flies were also seen at and around the wound (Figure 1).

The left eye was pseudophakic and had a best corrected vision of 6/18. There was no significant abnormality in the left eye. Punch biopsy was taken from the margin of the ulcer and sent for histopathological examination. It was diagnosed as moderately differentiated squamous cell carcinoma (Figure 2). Computerized tomography imaging of the orbit and the brain was done with 3D reconstruction by 64 slice spiral scanner after administrating IV contrast medium, to determine the extent of the disease. The progress of disease was compared with the CT scan which was done earlier. CT scan done in month of March 2013 showed ill defined, heterogeneously enhancing soft tissue mass lesion of approximate 85 x 59 x 57 mm size in antero-posterior, transverse and cranio-caudal axis respectively, involving intraconal, extraconal, and preseptal region of right orbit.

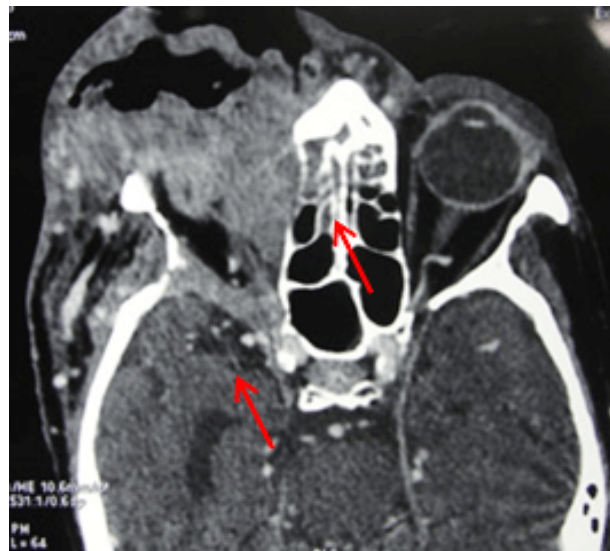


**Figure 2:** Photomicrograph showing moderately differentiated squamous cell carcinoma (Hematoxylin and Eosin 125x).

Multiple air pockets were noted within the lesion. Right eye globe, optic nerve and rectus muscle were not separately identified from lesion. The lesion superiorly into right frontal sinus, medially into ethmoidal air cells and posteriorly extradural intracranial extension into right temporal region with bony erosion of floor of frontal sinus, lamina papyracea, floor of right orbit and right sphenoidal bone (Figures 3a-3c). CT scan done eight months earlier (July 2012) showed ill-defined moderately enhancing soft tissue lesion measuring 26 x 16 x 24 mm was noted, arising from anterior part of right medial rectus muscle with no evidence of obvious bony erosion. The lesion caused mass effect over right globe (Figures 4a and 4b).

The crawling maggots were removed mechanically after putting turpentine oil and chloroform mixture which immobilized the maggots. Twenty two larvae were removed. The removed maggots were identified as species *Sarcophaga* by entomologist (Figure 5). Regular sterile dressing was done and systemic antibiotic and analgesics were given and patient improved symptomatically (Figure

6) and referred to radiotherapist for further management. Patient was planned for chemotherapy in the department of radiotherapy.

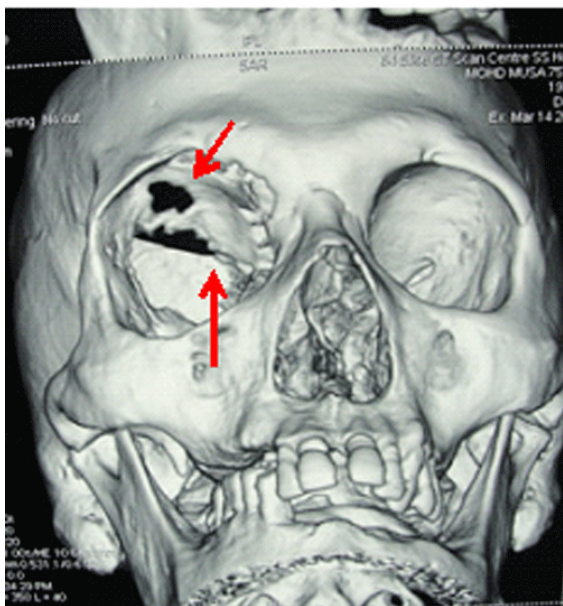


**Figure 3:** Contrast enhanced C.T. image of orbit (a) axial view showing ill-defined heterogeneously enhanced soft tissue mass lesion with multiple air pocket (Red arrow). Right ocular structures are not visualized.

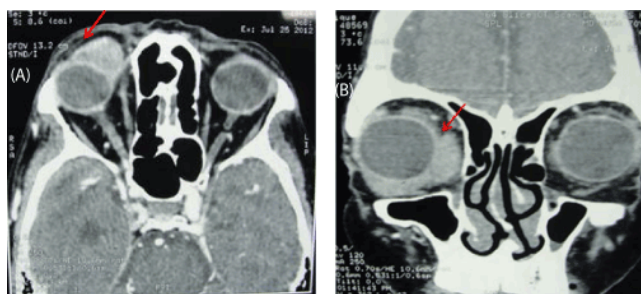


**Figure 3b:** Coronal view showing multiple enhancing lesions in superficial lobe of right parotid gland with area of central necrosis & extension of mass lesion into right frontal sinus, ethmoidal air cells with erosion of lamina papyracea and floor of orbit.





**Figure 3c:** 3 'D' CT image showing destruction (Red arrow) of right sphenoidal bone causing intracranial extension in right temporal region.



**Figure 4:** CT image taken eight month earlier (a) axial view and (b) coronal view showed moderate enhancing soft tissue density mass arising from anterior part of right medial rectus muscle with no evidence of bony erosion.



**Figure 5:** Photograph (magnified) of Formalin preserved maggot after removal showing segmented appearance of the body and mouth hooks.



**Figure 6:** Clinical photograph of same patient after complete removal of maggots.

## Discussion

Human myiasis is parasitoses caused by Depterous flies. In India first fuman ocular myiasis was reported by Elliot [1]. A system of classification of myiasis has been proposed by Bishop and later modified by James. Depending on the involved site, myiasis may be classified as cutaneous, ophthalmomyiasis, nasopharyngeal, urogenital and intestinal myiasis [6]. Clinically myiasis can be classified as primary myiasis and secondary myiasis. Primary myiasis caused by larvae that feed on living tissue (biophagus) is common in cattle but rare in humans. Secondary myiasis is caused by larvae (Necrobiophagous) that feeds on dead or necrotic tissue. These larvae invade in preexisting lesions like post traumatic wound, ulcerated or necrotic wounds of certain cutaneous neoplasm. Entomologically myiasis can be classified as obligators, facultative and accidental. In obligatory myiasis, the parasites depend on the host for its life cycle and larvae can survive only on warm-blooded live vertebrates. Flies of Ooesttridae, Calliphoridae Cuterebridae are obligate parasite. In Facultative myiasis, the parasites are free living but can invade the surrounding living tissue. Most of the files of the family Sarcophagidae are facultative parasite. In accidental myiasis the parasites are usually free living surviving on dead and decaying organic matter and myiasis develops when gravid female flies come in contact with the open body cavities and reproduce [5].

Ophthalmomyiasis is a rare type of ocular disease accounting for less than 5% of all cases of human myiasis [7]. According to site of the larval infestation in eye, ophthalmomyiasis is classified as external, internal or orbital myiasis. Most common type of ocular myiasis is external ophthalmomyiasis in which larval infestation is limited to superficial periocular tissue which can be divided into palpebral and conjunctival myiasis. In internal ophthalmomyiasis, larvae penetrate the sclera and migrate into the subretinal space. Bilateral subretinal ophthalmomyiasis intera was reported in 70 years female [8]. In orbital myiasis, large number of larvae invade and destroy the orbital content [1,8], Most of the ophthalmomyiasises are caused by *Dermatobia homini* (human botfly), *Cochliomyia hominivorax* (new world screw worm), *Hypoderma bolis* (hornet fly), bovis *Oestrus ovis* (sheep botfly), *Wohlfahrtia magnifica* (flesh fly) [5]. Last year we reported a case of post traumatic orbital myiasis caused by *Wohlfahrtia magnifica* in child [1].

Our present case is a secondary orbital myiasis caused by Fly of *Sarcophaga* Species in neglected squamous cell carcinoma of bulbar conjunctiva invading to right medial rectus muscle. Many other authors also reported secondary ophthalmomyiasis in carcinoma patients [9-12]. The common risk factors associated with ophthalmomyiasis are advanced age, poor social-economic status, overcrowding, poor sanitation and poor personal hygiene. Alcoholics, chronic debilitating diseases like diabetes and mental disorders may lead to poor hygiene maintenance and predisposes to ophthalmomyiasis. The main predisposing factors for larval infestation in our patient were probably large area of necrotic tissue offered by advanced squamous cell carcinoma since necrotic and decomposed tissue attracts flies. Illiteracy, lack of personal hygiene, overcrowded living environment and hot tropical climate favour the breeding of flies are other predisposing factors.

Presence of crawling maggots is diagnostic of myiasis. The contrast enhanced computed tomography or magnetic resonance imaging of orbit and brain is useful for delineating the extent of infestation and excluding the intracranial spread [9]. The treatment of less extensive ophthalmomyiasis consists of mechanical removal of larvae. Occlusion-suffocation approach is advised in which chloroform, turpentine oil, petroleum jelly, liquid paraffin ethyl chloride and liquid nitrogen etc. placed in central area. The blockage at spiracles of larvae by these chemical substances forces the aerobic larvae to reach surface for air. Although Ivermectin is effective for both prophylaxis and treatment of botfly infestation [13] but in our case we did not use it as patient improved significantly by mechanical removal. In case of extensive ophthalmomyiasis, exenteration and surgical debridement of necrotic tissue is advised to prevent the tissue destruction and intracranial extension [1,8]. Following measures can prevent the human myiasis:

(a) Adequate sanitation and disposal of garbage, (b) Proper storage of food and washing it before food consumption, (c) The use of screens and mosquito nets is essential to prevent flies from reaching the skin (d) In endemic area, sleeping without clothes, outdoor and on the floor should be avoided (e) Make sure wounds are cleaned and dressed regularly (f) Always wear long-sleeved clothing and keep wounds covered (g) Regular spraying or fogging of insecticide is necessary [13].

## Conclusion

Orbital myiasis is a rare and preventable ocular disease. Myiasis can complicate the ocular malignancies, hence early detection, treatment and adequate prevention is of paramount importance. Computed tomography imaging is essential to exclude intracranial spread.

Disease can be prevented by controlling fly population, educating the patients those having advanced malignancy about good ocular hygiene and basic sanitation.

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