



# Concurrent primary and secondary myiasis on basal cell carcinoma<sup>\*</sup>

## Concomitância de miíase primária e secundária em lesão de carcinoma basocelular

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**Abstract:** Myiasis is a disease caused by infestation of fly larvae in human and other vertebrate tissues. It is a skin condition common in tropical and subtropical countries and its predisposing factors are: chronic diseases, immunodeficiency, poor hygiene, senility, psychiatric disorders, skin cancers and ulcerated mucosae. We report the case of a healthy patient who after traumatic injury of a preexisting lesion showed a tumor on the dorsal region parasitized by fly larvae. The histopathological examination performed for the diagnosis of skin neoplasm surprisingly revealed the presence of a partially degenerated larva with characteristics of *Dermatobia hominis*, suggesting an association of primary and secondary myiasis on basal cell carcinoma.

**Keywords:** Carcinoma, basal cell; Myiasis; Skin neoplasms

**Resumo:** A miíase é uma doença causada por infestação de larvas de moscas nos tecidos humanos ou de outros animais vertebrados. É dermatose comum em países tropicais e subtropicais e tem como fatores predisponentes: doenças crônicas, imunodeficiência, má higiene, senilidade, doenças psiquiátricas, cânceres cutâneos e de mucosas ulcerados. Relata-se caso de paciente hígido que após trauma sobre lesão pré-existente, apresentou tumoração na região dorsal parasitada por larvas de moscas. O exame histopatológico realizado para o diagnóstico da neoplasia, de modo surpreendente, evidenciou a presença de uma larva parcialmente degenerada com características de *Dermatobia hominis*, sugerindo associação de miíase primária e secundária em carcinoma basocelular.

**Palavras-chave:** Carcinoma basocelular; Miíase; Neoplasias cutâneas

### INTRODUCTION

Myiasis is a disease caused by infestation of larvae of the Diptera order in human and other vertebrate animal tissues, where they complete their cycle totally or in part, feeding on living or dead tissue, as well as on body fluids.<sup>1</sup> It occurs more frequently in tropical and subtropical countries, but has been described in all regions of the globe.<sup>2,3</sup> In North America and in Europe, reports have been connected to travelers who visited endemic areas.<sup>2,3,4</sup> The description of skin cancer cases associated with myiasis is infrequent

in the literature.<sup>4</sup>

Primary myiasis is caused by biontophage larvae that feed on living tissue.<sup>5</sup> Such larvae invade and develop in healthy tissues.<sup>5,6</sup> The most common clinical form is furuncular myiasis, most times caused by the *Dermatobia hominis* species.<sup>5,6</sup> The female of this fly lays eggs on other flies and hematophage mosquitoes; while these feed on man or animals the larvae project outside the egg and penetrate the skin through the places stung by the insect or hair folli-

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cles.<sup>1</sup> In these places furuncular lesions appear, with a central opening through which the larvae breathe. The clinical picture may be accompanied by pain, itching, secondary bacterial infection and abscess formation.<sup>1</sup> When they reach maturity the larvae leave the nodules, drop onto the soil, transform into pupae first and then into winged insects.<sup>6</sup>

Secondary myiasis is caused by larvae of necrobiontophage flies that feed on necrotic tissue.<sup>5</sup> These larvae invade previously compromised tissues with necrotic ulcerations or mucosae.<sup>5,6</sup> They present in cutaneous and cavitary forms. In the cutaneous form the eggs are laid directly on the ulcerated skin and is caused mainly by *Cochliomyia macellaria* flies of the genus *Lucilia* and the *Sarcophagidae* family.<sup>6</sup> Cavitary myiasis affects the nasal cavity, the ear and the orbit. The severity depends on the location and degree of destruction, the most severe cases being caused by the *Cochliomyia hominivorax*.<sup>6</sup>

The diagnosis is based on the clinical and epidemiological history as well as on the visualization of the larva in the lesion. Laboratory investigation is rarely necessary. The Doppler ultrasound confirms the presence of the larva within the furuncular lesion, quantity, size and location.<sup>1,7</sup> Computerized tomography and magnetic resonance evaluate the extension of the lesion, mainly in cavitary myiasis.<sup>8,9</sup> The histopathological examination identified inflammatory reactions around the larva with lymphocytes, eosinophils, neutrophils, histiocytes, fibroblasts, plasmocytes, mastocytes and Langerhans cells, indicating a complex interaction between the host and the parasite.<sup>1,10</sup> Immunotyping demonstrates predominance of activated T helper cells in the infiltrate and electron microscopy shows an abundant number of activated fibroblasts synthesizing collagen, probably by larva stimulation.<sup>10</sup>

The treatment consists in removal of the larvae by several methods.<sup>1,2,6</sup> In the furuncular form, the parasite is removed with tweezers, which may be aided by compression of the lesion, by surgical widening of the nodule opening or by obstruction of the opening, asphyxiating the larva that tries to come out to breathe. The occlusion may be made by Vaseline covering the nodule with surgical tape or a lay technique that uses bacon.<sup>6</sup> In the cutaneous form, the removal is manual after killing the larvae with ether or liquid nitrogen.<sup>6</sup> The use of oral ivermectin has been reported in cavitary myiasis.

The use of these larvae, mainly the *Lucilia sericata*, as a debridement method for necrotic tissues in chronic ulcers has been reported.<sup>1</sup> The eggs are treated with sterilizing solutions, applied to the wounds and the resulting larvae secrete enzymes that are able to digest and liquefy the necrotic tissue, which is

ingested.<sup>4</sup>

In this article a case of secondary myiasis on basal cell carcinoma located on the back of a healthy patient is described; in an unusual manner, a larva was detected beside the neoplasm in the histological examination, suggesting association with primary myiasis.

#### CASE REPORT

A white 50-year old male patient had suffered trauma to his back two months before, on preexisting lesion that had grown for one year. He treated the wound himself, leaving it undressed and exposed to the environment, as he did not wear a shirt. As the wound worsened, he looked for specialized care. He denied suffering from chronic diseases. The general examination showed that he was physically and mentally healthy; the dermatological assessment revealed an ulcerated surface tumoral lesion in the interscapular region, with a darkened crust and yellow secretion. After removal of the crust, several mobile larvae of 5 to 7 mm were observed on the lesion. It was treated with local antiseptics, manual removal of larvae, ivermectin and oral antibiotic for the secondary bacterial infection. One week later, he still presented an ulcerated tumor lesion with a small opening in the upper extremity and surrounding erythema (Figure 1). On that occasion a larva with elliptical form, rounded center and tapered extremities, with around 1 cm and white-yellowish color. Considering the possibility of a malignant neoplasm occurring as a basic disease, a biopsy was made. Two weeks later there was complete regression of the inflammatory process, but a pink plaque of ill-defined limits and pearly aspect persisted (Figure 2).

The histopathological examination demonstrated a sound epidermis and diffuse inflammatory pro-



FIGURE 1: Ulcerated tumor located on the back with surrounding erythema and a small opening at the upper extremity, from which the fly larva was removed



FIGURE 2: After two weeks of myiasis treatment, a pink plaque of ill-defined limits and a shiny, pearly aspect persisted

cess in the dermis, beside a neoplasm of basaloid cells, with peripheral palisade formation (Figures 3 and 4). In the largest growth an organism was identified that was compatible with a degenerated larva, presenting a muscular internal layer, without visualization of pigmented spicules. Surrounding it there was inflammatory reaction with neutrophils, eosinophils, lymphocytes, histiocytes and plasmocytes (Figure 5). The morphological characteristics of the larva and its location in the deep dermis layer were suggestive of *Dermatobia hominis*. Therefore, based on the clinical history and histopathological examination, it is valid to consider the association of da primary and secondary myiasis for the reported case.

**DISCUSSION**

Myiasis is frequently found in patients with risk factors such as advanced age, low social class, poor

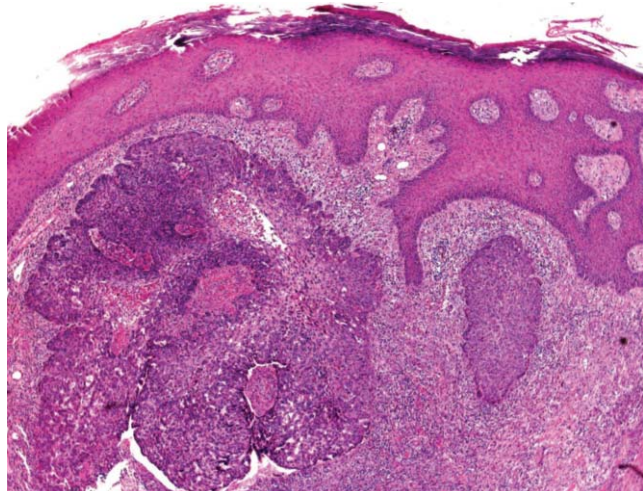


FIGURE 4: Neoplasm of basaloid cells, with peripheral palisade formation (HE 10x)

hygiene, alcoholics, carriers of chronic diseases such as diabetes mellitus and peripheral vascular disease that may develop chronic ulcers, psychiatric disorders or that lower conscience level.<sup>2,8,9,11,12</sup> In this case, the patient presented good physical and mental health, but sought medical care only after secondary parasitization of skin cancer.

Ulcerated, necrotic lesions exposed to the environment without wound dressings are predisposing factors for the onset of myiasis on skin cancer. However, there are few reports in the literature of this association and it is possible that cases have been underreported. A review carried out on Pubmed on September 15, 2010 with the key words “myiasis” and “skin cancer” returned twenty-five articles. In fourteen, an association of myiasis with skin tumors was observed. Among them, five were myiasis on squa-

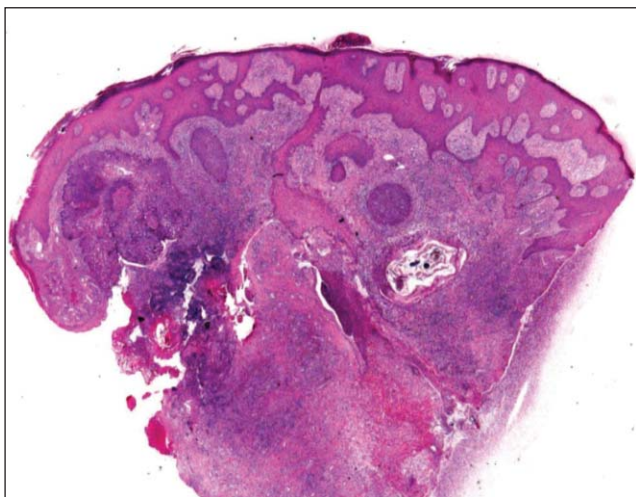


FIGURE 3: Hyperplasia of the epithelium. Diffuse inflammatory process of the dermis (HE 5x)

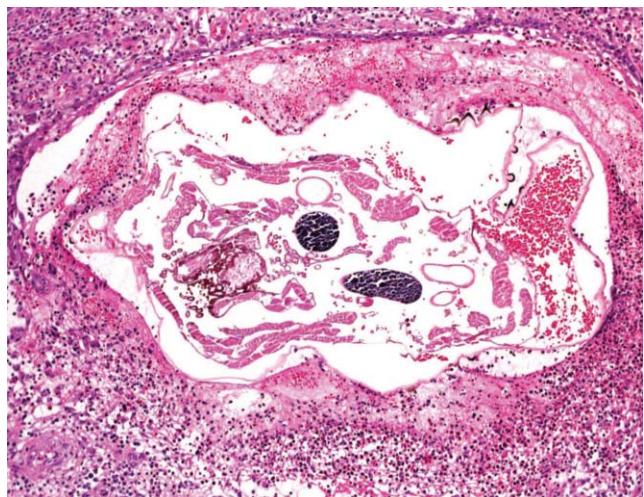


FIGURE 5: In the dermis, a structure compatible with a larva presenting an identifiable internal muscle layer and a surrounding inflammatory infiltrate (HE 40x)

mous cell carcinoma, two on basal cell carcinoma and one on eccrine adnexal neoplasm.<sup>3,4,5,8, 9,11,13, 14</sup> Such reports were on secondary myiasis, six cases of the cutaneous form and two of the cavitary form. Rubio et al described three cases of myiasis on tumoral lesions: one was a larynx carcinoma with extensive involvement of the skin in the cervical region, one was base cell and one was squamous cell carcinoma.<sup>2</sup> Sesterhenn et al reported occurrence of myiasis in cutaneous metastasis of oropharyngeal cancer and reviewed 20 cases of myiasis in primary head and neck skin cancer.<sup>12</sup> Yaghoobi and Bagherani reported a case of myiasis in epidermoid carcinoma on the face and counted four more cases of skin cancers associated with myiasis in the medical literature up to 2009.<sup>13</sup> Hawayek and Mutasim described this infestation in a giant squamous cell carcinoma lesion on the scalp and counted two other cases on squamous cell carcinoma, one on Bowen disease and one in melanoblastoma in the literature.<sup>4</sup> In Brazil, Gabriel et al reported a case of myiasis in a base cell carcinoma.<sup>5</sup> In the Brazilian Annals of Dermatology, 1992, in a letter to the editor, there is a mention to a case of myiasis associated with base cell epitheliomas on the face.<sup>15</sup> In the mentioned studies there is no reference to associations of prima-

ry and secondary myiasis on malignant cutaneous neoplasms.

The initial diagnosis of the case here presented, considering the history and clinical picture, was secondary myiasis associated with a basic neoplasm. However, the removal of a larva from the lesion later on and its identification in the histopathological exam as larva located in deep dermis suggest parasitism by *Dermatobia hominis* and primary myiasis. The non visualization of pigmented spicules in the external layer of the larva interfered with this diagnosis. Nevertheless, the other histological differentials would not be compatible with the clinical symptoms presented. Thus there were, at least, two primary myiasis larvae, one that was taken out of the lesion and another observed histologically.

Considering that myiasis is an endemic disease in South America, Central America and Africa, but that it can affect people from other continents also, mainly due to the current migratory movements, it is necessary for dermatologists from the entire world to be attentive to the habitual clinical manifestations of the disease and the possibility for it to mask a basic disease, such as skin cancer, as in the presented case. □

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