Abstract
Myiasis, infestation of live human and vertebrate animals by larvae, can complicate ulcers and open wounds. Although myiasis occurs in neglected erosions of pemphigus, such a complication is not documented in the literature. Herein, we report a case of myiasis complicating pemphigus vulgaris and describe its dermatoscopic features.

Key Words: Dermatoscopy, Myiasis, Pemphigus

Introduction
Pemphigus is a chronic, autoimmune blistering disorder affecting the skin and mucous membranes. Cutaneous lesions of pemphigus classically present as flaccid superficial blisters, which rupture to form painful raw erosions. Herein, we report an interesting case of cutaneous myiasis complicating the raw erosions of pemphigus vulgaris (PV), a previously unreported association and describe its dermatoscopic features.

Case Report
An adolescent boy from rural India, a known case of mucocutaneous PV for the past 5 years, presented to the medical emergency with acute disease flare. The diagnosis of PV was based on the clinical features of recurrent flaccid fluid-filled blisters over the body and painful oral erosions and corroborated by histopathological findings of tombstoning of basal keratinocytes and intercellular deposition of immune complexes on direct immunofluorescence. In addition, he also suffered from abetalipoproteinemia, clinically manifesting as progressive ataxia.

On mucocutaneous examination, multiple, flaccid, fluid-filled vesicles, bullae, and raw erosions were noted to involve the face, trunk, back, and extremities. Erosions were also noted on buccal mucosa and under surface of the tongue. His cutaneous Autoimmune Bullous Skin Disorder Intensity Score (ABSIS) at admission was 25. A sinus tract was noted on the right medial thigh, the opening of which contained multiple mobile cylindrical larvae.

Dermatoscopic evaluation was performed using a DermLite II Hybrid M Dermatoscope at ×10 magnification in polarized mode, and photographs were captured by Apple iPhone 6 Plus with the aid of DermLite app. On dermatoscopic evaluation, the caudal end of the larvae was visualized. The spiracles contained two oval openings with incomplete peritreme and prominent slits [Figure 1a]. There was paronychia of the second toe...
of the right leg and on removal of the nail plate; several larvae were noted underneath the lateral nail fold. These were better visualized on dermatoscopy [Figure 1b]. Contrast-enhanced magnetic resonance imaging of the right thigh showed a linear T2 hyperintense tract extending anterosuperiorly along the subcutaneous plane measuring 8.5 cm in length and extending till the myofascial interface. Multiple oval and round T2 hypointensities were seen within this tract. A diagnosis of wound myiasis complicating skin lesions of PV was made. Few of the larvae were extracted from the sinus tract and examined under dermatoscope in polarized mode [Figure 2a]. The larvae had a typical maggot shape. Other morphological features such as multiple tiny spines on the body surface, darkly pigmented dorsal tracheal segment, wall of slits without lateral swelling, incomplete peritreme at each spiracle, inner slits directed toward median line ventrally, and button surrounding each spiracle were identified. Based on these morphological features and light microscopy findings [Figure 2b], the larvae were confirmed to belong to *Phormia regina* (black blowfly).[^1]

The patient was treated with dexamethasone pulse therapy (100 mg of dexamethasone on 3 consecutive days) and oral prednisolone. Cutaneous myiasis was managed by turpentine oil flushes and manual removal of larvae. At 4-week follow-up, the patient had achieved control of disease activity, and magnetic resonance imaging of the sinus tract showed no larvae.

**Discussion**

Myiasis is the infestation of live human and vertebrate animals by larvae of the order Diptera, family Calliphoridae that feed for varying time periods on the host’s dead or living tissue, body substances, or ingested food.[^2] Wound myiasis occurs when fly larvae infest open wounds and usually affects neglected traumatic wounds, diabetic foot, and necrotic lesions of various malignancies.[^3][^4] Wound myiasis is also known to occur in patients with mental retardation or psychiatric illnesses.[^4] These larvae then feed on the dead and necrotic tissue and progress through various stages of its life cycle. Wound myiasis differs from furuncular and creeping myiasis in causative fly, mode of acquisition, and clinical features.[^5]

Our case is unique in that wound myiasis complicating pemphigus has not been previously described. Poor nursing care, low socioeconomic status, unhygienic living conditions, and livestock rearing in the neighborhood were probably contributing factors in the occurrence of myiasis. In addition, our patient also had ataxia and incoordination of limb movements secondary to abetalipoproteinemia, which severely limited his body movements and self-care. Further, neglected wound myiasis had led to the formation of a sinus tract over the right medial thigh containing multiple larvae.

Dermatoscopy has been previously reported to aid in clinical diagnosis of furuncular myiasis.[^5] Dermatoscopic features described in furuncular myiasis include a central opening containing a yellowish structure with black spines, which shows periodic in and out movements. Also reported were bird’s feet-like structures, corresponding to respiratory spiracles.[^5] Unlike furuncular myiasis, wound myiasis can be visualized through unaided eyes. However, dermatoscopy evaluation in our case helped in species identification by showing incomplete peritreme and three prominent slits.[^1] Other species of wound myiasis such as *Cochliomyia hominivorax* and *Chrysomya bezziana* have smooth body surface with the absence of tiny spines of third instar larva and have an open peritreme. In *C. hominivorax*, the 10th to 12th dorsal tracheal trunk is darkly pigmented, and in case of *C. bezziana*, only the last half of the 12th segment is darkly pigmented.[^1]

---

[^1]: Vinay, et al.: Dermatoscopy in myiasis
[^2]: Figure 1: (a) Dermatoscopic examination of the larvae of *Phormia regina* showing caudal respiratory apparatus with two oval opening representing dorsal tracheal trunks in posterior segment (red circle). Incomplete peritreme and prominent slit in each of the three spiracles can be appreciated (×10), (b) Multiple larvae in the nail fold (×10)

[^3]: Figure 2: (a) Dermatoscopic image of third instar larva of *Phormia regina* showing dorsal tracheal trunk in posterior segment (between solid arrowheads), multiple tiny spines on the body surface (green circles), and mouth parts (orange circle), (×10). (b) Light microscopy of third instar larva of *Phormia regina* showing caudal respiratory apparatus and posterior spiracle (red circle) and multiple tiny spines on the body surface (green circles). Incomplete peritreme (blue arc) and prominent slit in each of the three spiracles (black arrows) can be appreciated, (×40)

[^4]: Figure 3: Dermatoscopic examination of the larvae of *Cochliomyia hominivorax* and *Chrysomya bezziana* showing caudal respiratory apparatus and posterior spiracle (red circle) and multiple tiny spines on the body surface (green circles). Incomplete peritreme (blue arc) and prominent slit in each of the three spiracles (black arrows) can be appreciated, (×40)

[^5]: Figure 4: Dermatoscopic examination of the larvae of *Cochliomyia hominivorax* and *Chrysomya bezziana* showing caudal respiratory apparatus and posterior spiracle (red circle) and multiple tiny spines on the body surface (green circles). Incomplete peritreme (blue arc) and prominent slit in each of the three spiracles (black arrows) can be appreciated, (×40)
Wound infestation in our case was treated with turpentine oil flushes. Turpentine oil is known for its larvicidal action, and it also causes deep-seated larvae to migrate upward, which can then be easily removed by forceps. Other reported effective treatments include oral or topical ivermectin and ethanol or chloroform spray.

**Financial support and sponsorship**
Nil.

**Conflicts of interest**
There are no conflicts of interest.

**What is new?**
- Myiasis can complicate raw neglected erosions of pemphigus
- Dermatoscopic evaluation showed caudal openings, incomplete peritreme, and prominent slit in each of the three spiracles, which are features of *P. regina*.

**References**
1. Mathison BA, Pritt BS. Laboratory identification of arthropod ectoparasites. Clin Microbiol Rev 2014;27:48-67.
2. Zumpt F. Myiasis in Man and Animals in the Old World. London: Butterworths; 1965.
3. McGraw TA, Turiansky GW. Cutaneous myiasis. J Am Acad Dermatol 2008;58:907-26.
4. Singh A, Singh Z. Incidence of myiasis among humans - A review. Parasitol Res 2015;114:3183-99.
5. Silva de Lima A, Rovere RK. Furuncular myiasis: Dermoscopic features using a cross-polarized device without contact. J Am Acad Dermatol 2015;72 1 Suppl: S6-7.
6. Kumarasinghe SP, Karunaweera ND, Ihalamulla RL, Arambewela LS, Dissanayake RD. Larvicidal effects of mineral turpentine, low aromatic white spirits, aqueous extracts of *Cassia alata*, and aqueous extracts, ethanolic extracts and essential oil of betel leaf (*Piper betle*) on *Chrysomya megacephala*. Int J Dermatol 2002;41:877-80.