

# PENILE MYIASIS CAUSED BY *PROTOPHORMIA TERRAENOVAE*

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**Abstract.** Penile myiasis is a rare parasitic disease. We report here a case of a 59-year-old male with penile myiasis caused by *Protophormia terraenovae*. We give the clinical and pathological features of the patient and review the literature regarding penile myiasis. This is the first published clinicopathological report of penile myiasis caused by *Protophormia terraenovae*.

**Keywords:** myiasis, penis, *Protophormia terraenovae*

## INTRODUCTION

Myiasis is defined as the infestation of vertebrate hosts with the larval or pupal stage (maggots) of certain diptera flies, first described by Hope (1840). The diagnosis is categorized as obligate, deliberate egg-laying in or on tissues, or as facultative, opportunistic infestation by occupying wounds for larval incubation (Burgess, 2003). Myiasis is uncommon in Western countries when only single cases have been reported and they usually involve patients who have traveled to endemic countries. The nose, ears, tracheostomy-wounds, face, oral cavity, and serous cavities are commonly involved (Francesconi and Lupi, 2012).

Genital myiasis is uncommon. The purpose of this paper is to report the case of penile myiasis and review the literature.

## CASE REPORT

A 59-year-old male patient from Yala Province, Thailand presented to Yala regional hospital with a painful, foul-smelling ulcer on the glans penis. He is a laborer in a small farm and wears a short sarong without underwear. He had no history of underlying disease. He had a history of genital trauma two weeks before. The penis initially developed an ulcerative lesion on the prepuce; a few days later, the glans of penis developed an ulcer with exudate. The patient gave no history of fever or urinary symptoms. His temperature on presentation was 37°C. Physical examination showed an ulcerative lesion with central necrotic tissue and multiple maggots crawling on the glans penis (Fig 1). The scrotum was intact. No inguinal lymphadenopathy was detected.

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Fig 1–Ulcerative lesion with central necrotic tissue and multiple maggots crawling on the glans penis.

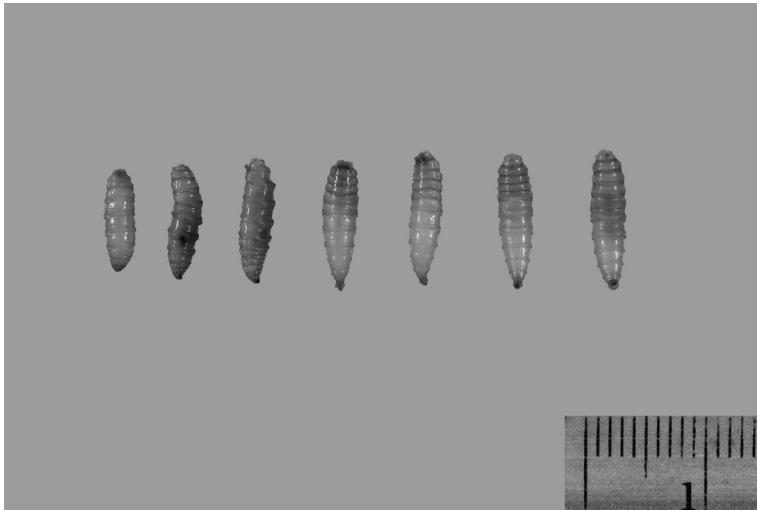


Fig 2–Maggots of *Protophormia terraenovae* after removal from the infected site.

of the necrotic tissue was performed. The white maggots measuring 2 to 3 mm in diameter, 8 to 12 mm in length were collected and identified as *Protophormia terraenovae* (Fig 2). A day later, the wound was explored again and the remaining maggots came out spontaneously. The patient was treated with antibiotic dressings and intravenous ceftriaxone and metronidazole for one week. The patient was then discharged with 0.9% sodium chloride with iodopovidone dressings and oral ciprofloxacin plus methonidazole antibiotics for two weeks. The patient was educated and motivated with regards to personal hygiene. Three months follow-up demonstrated satisfactory and uneventful healing with resolute of the penile lesion.

The patient had a complete blood count done which showed leukocytosis (white blood cell count: 10,600 cells/ $\mu$ l with 86% of neutrophils). Urinalysis showed increased white blood cells: 10-20/HPF. The provisional diagnosis was penile ulcer with myiasis and lower urinary tract infection. Hemoculture and urine culture were performed and revealed no growth of aerobic bacteria. Surgical debridement

## DISCUSSION

Cutaneous myiasis is the infestation of the skin or mucosal membrane by larval or pupal stage maggots of certain diptera (Francesconi and Lupi, 2012). Wound myiasis affects skin with previous lesions and may consume both dead and living tissue (Francesconi and Lupi, 2012). Maggots are seen in exposed areas in small neglected

children, very old patients, the mentally retarded and bedridden patients who are not able to take care of themselves (Sherman, 2000; Koifman *et al*, 2017). Homelessness, alcoholism, and peripheral vascular disease are common cofactors (Sherman, 2000). Myiasis shows a male predilection with a male:female ratio of 5.5:1 (Sherman, 2000). The lower extremity is the most common site of wound myiasis (Sherman, 2000). Genital myiasis is an uncommon occurrence and may involve male or female external genital organs including the penis, scrotum, vulva and vagina (Koifman *et al*, 2017).

Penile myiasis is rare. The larvae reported to cause penile myiasis are: *Psychoda albipennis*, *Dermatobia hominis*, *Lucilia sericata*, and *Cordylobia anthropophaga* (Pepper *et al*, 2008; Nagy, 2012; Lyra *et al*, 2014; Koifman *et al*, 2017). *P. terraenovae* has never been reported to cause penile myiasis. The various forms of *P. terraenovae* include the northern blowfly, blow fly, blue-bottle fly and blue-arsed fly (Zhang *et al*, 2017). *P. terraenovae* is commonly used for maggot debridement therapy (Nuesch *et al*, 2002). The main concern with the use of maggot debridement therapy is secondary infection (Nuesch *et al*, 2002). Contaminated maggots of *P. terraenovae* are blamed for bloodstream infections due to *Providencia stuartii* and *Candida albicans* (Nuesch *et al*, 2002). *P. terraenovae* is a vector of bacteria carrying colistin resistance genes (Zhang *et al*, 2017). Despite promising benefits, maggot debridement therapy can be threatened by an infectious complication. Genital myiasis may result in complications including: minor genital irritation, genitourinary tract infection, auto-amputation of the penis, and even death due to secondary infection (Koifman *et al*, 2017).

The cornerstones of myiasis treatment are surgical debridement of necrotic tissue

and broad-spectrum antibiotics (Francesconi and Lupi, 2012). The surgical treatment of myiasis consists of 1) the application of a toxic substance to the larva and eggs, 2) the production of localized hypoxia to force the emergence of the larva, and 3) the mechanical or surgical removal of the maggots (Francesconi and Lupi, 2012). Myiasis-wounds are considered contaminated; therefore, proper wound treatment is essential to prevent complicated infections. The wound should be cleansed and copiously irrigated with water, normal saline, hydrogen peroxide, or dilute iodopovidone solution. Empiric broad-spectrum antibiotic therapy should be instituted as soon as possible, until the culture results could make adjusted the therapy.

In conclusion, we describe here a rare case of penile myiasis caused by *P. terraenovae* in a male laborer. Penile myiasis must be considered in the differential diagnosis of genital infectious diseases, especially in patients with precarious hygiene, low socio-economic status and urogenital problems (Sherman, 2000; Koifman *et al*, 2017). Climatic changes and global warming in recent years along with the rise in international travel and immigration have increased the likelihood of spread of myiasis (Moshaverinia and Kazemi Mehrjerdi, 2016). Public health education, combined with proper diagnosis and treatment, is crucial.

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#### REFERENCES

- Burgess IF. Myiasis: maggot infestation. *Nurs Times* 2003; 99: 51-3.

- Francesconi F, Lupi O. Myiasis. *Clin Microbiol Rev* 2012; 25: 79-105.
- Hope FW. On insects and their larvae occasionally found in the human body. *R Ent Soc Trans* 1840; 2: 256-71.
- Koifman L, Barros R, Schulze L, Ornellas AA, Favorito LA. Myiasis associated with penile carcinoma: a new trend in developing countries? *Int Braz J Urol Int Braz J Urol* 2017; 43: 73-9.
- Lyra MR, Fonseca BC, Ganem NS. Furuncular myiasis on glans penis. *Am J Trop Med Hyg* 2014; 91: 217-8.
- Moshaverinia A, Kazemi Mehrjerdi H. Canine myiasis and its causal agents in northeastern Iran. *Iran J Parasitol* 2016; 11: 91-7.
- Nagy V. Unusual presentation of the urogenital myiasis caused by *Lucilia sericata* (Diptera: Calliphoridae). *Ann Agric Environ Med* 2012; 19: 802-4.
- Nuesch R, Rahm G, Rudin W, et al. Clustering of bloodstream infections during maggot debridement therapy using contaminated larvae of *Protophormia terraenovae*. *Infection* 2002; 30: 306-9.
- Pepper WC, Benaragama SK, Kalsi JS, Karim O. Cutaneous myiasis of *Cordylobia anthropophaga*. *Urology* 2008; 72: 65.
- Sherman RA. Wound myiasis in urban and suburban United States. *Arch Intern Med* 2000; 160: 2004-14.
- Zhang J, Wang J, Chen L, et al. Housefly (*Musca domestica*) and blow fly (*Protophormia terraenovae*) as vectors of bacteria carrying colistin resistance genes. *Appl Environ Microbiol* 2017; 84: e01736-17.