

Two cases of subungual myiasis in predisposed patients



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INTRODUCTION

Myiasis is an ectoparasitic infestation by fly larvae that rarely occurs in humans. It is classified clinically based on the infested body region, including cutaneous, enteric, ophthalmic, nasopharyngeal, auricular, oral, urogenital, and gastrointestinal myiasis.¹ Although cutaneous myiasis is one of the most common forms, subungual myiasis has very rarely been reported worldwide. We report 2 cases of subungual myiasis in patients with predisposing factors.

CASE REPORTS

Case 1

A 64-year-old man visited the emergency department with pain in the great toe of his right foot that developed 1 day prior to the presentation. Physical examination revealed whitish living organisms in the subungual area of the great toenail of the right foot and onycholysis. Edema, scaling, and hyperkeratosis on both legs and feet were also observed (Fig 1, A). He had a history of liver cirrhosis, severe anemia, and lymphedema of the lower extremities. He lived alone and had poor hygiene. The patient was clinically diagnosed with subungual myiasis and treated via manual removal of larvae and with oral antibiotics for cellulitis of the legs and feet (Fig 1, B).

Case 2

A 62-year-old man presented with nail dystrophy of the great toe of the right foot. He could not

recall the exact onset of these changes. Physical examination revealed yellowish discoloration, hyperkeratosis, and onycholysis of the great toenail of the right foot, with living larvae underneath (Fig 2, A and B). He had been diagnosed with pancreatic cancer 13 months prior to the symptoms and received 13 cycles of chemotherapy with gemcitabine and abraxane until a month ago. The patient was treated with nail extraction, larvae removal, and betadine solution footbaths. The parasite examination revealed larvae of the order *Diptera* (true flies) (Fig 2, C and D), and he was diagnosed with subungual myiasis.

DISCUSSION

Myiasis, defined as the infestation of larvae of true flies, is prevalent in tropical and rural regions. Meanwhile, the disease is rare in temperate and urban regions.¹ In urban areas, it typically affects people with poor personal hygiene, poor social conditions, or other predisposing factors.¹ Additionally, the subungual area is a rarely reported infestation site. A thorough literature search identified only 5 individual cases of subungual myiasis worldwide,²⁻⁶ which are summarized in Table I.

Risk factors for cutaneous myiasis include poor personal hygiene, psychiatric illness, and an immunosuppressed state.¹ In addition to these general factors, there are important factors specific to unusual subungual myiasis. First, taxane-based chemotherapy induces onycholysis as a direct toxic

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Fig 1. **A**, Larvae in the subungual area of the great toenail of the right foot. **B**, Manual removal of larvae was done.



Fig 2. **A**, The great toenail of the right foot with nail dystrophy. **B**, The great toenail of the right foot with larvae in the subungual area. **C** and **D**, The isolated whitish larva was identified as a larva of true flies (*Diptera*).

effect while causing peripheral neuropathy, impairing microcirculation, which ultimately inflicts nail bed damage.⁶ The microdamage on the nail plate and bed provides a suitable habitat for maggots. Second, peripheral neuropathy due to diabetes, edema, or venous dysfunction can impair microcirculation; hence, they also serve as risk factors for subungual myiasis with a mechanism similar to that of the taxane. Third, previous case reports and present cases documented associated nail changes, including subungual hematoma from trauma, onycholysis, and onychomycosis. We believe that these pathologic conditions create space between the nail plate and bed. Consequently, this gap provides a niche for the oviposition of flies and the infestation of larvae. Similarly, the infestation of

living and undamaged adult corn thrip was found under a dystrophic toenail with onychomycosis of a 32-year-old man in Germany.⁷

The diagnosis of subungual myiasis is based on larvae detection. However, the subungual location is a rare infestation site, and the detection is hindered by the nail plate. Thus, it can be easily missed, leading to unnecessary workups or delayed diagnosis.³ Constant vigilance for this disease is required, especially in patients with predisposing factors. Species causing subungual myiasis include families such as *Sarcophagidae*, *Calliporidae*, and *Muscidae*. Based on the previous case reports, the most common agents were from the family *Sarcophagidae*.²⁻⁶ In case 1, further identification of larvae was unavailable because they were discarded

Table I. Summarized review of the literature

Literature	Age/sex/country	Organism involved	Predisposing factor	Accompanied nail changes	Treatment
Muñyon et al ² (1978)	F/47/not available	<i>Musca domestica</i>	Not available	Subungual hematoma from trauma	No information available
García-Doval et al ³ (2000)	F/90/Spain	<i>Sarcophaga</i> species	Diabetes mellitus, valvular incompetence of lower leg veins, lower-limb ischemia, and leg edema	Onycholysis and periungual erythema	Nail extraction and larvae removal
Balcioğlu et al ⁴ (2008)	F/65/Turkey	<i>Calliphora</i> species	Poor personal hygiene (living alone) and psychiatric illness	Onychomycosis	Nail extraction and larvae removal and systemic antibiotics
Dagci et al ⁵ (2008)	M/30/Turkey	<i>Sarcophaga</i> species	Immunosuppressive drugs (etanercept, low-dose corticosteroid) for psoriatic arthritis	Dystrophy and hyperkeratosis on toe nails	Manual larvae removal and discontinuation of immunosuppressive drugs (etanercept)
Piraccini et al ⁶ (2016)	F/68/Italy	Sarcophagid fly larvae	Chemotherapy (paclitaxel) for breast cancer	Black nail discoloration with mild pain and onycholysis	Nail extraction and larvae removal, daily footbaths with antiseptic solution, and topical and systemic antibiotics
Present case 1	M/64/Korea	Not available	Poor personal hygiene (living alone) and lymphedema	Onycholysis	Manual removal of larvae and oral antibiotics
Present case 2	M/62/Korea	Sarcophagid fly larvae	Chemotherapy (gemcitabine and abraxane) for pancreatic cancer	Onycholysis and white nail discoloration	Nail extraction, larvae removal, and footbaths with betadine solution

F, Female; M, male.

after the treatment. The larvae from case 2 measured approximately 10 mm in length and exhibited typical sarcophagid features with posterior spiracles lying within a hollow.⁶

Treatment of subungual myiasis involves manual removal of the larvae with or without extraction of the affected nail plate.²⁻⁶ Footbaths with antiseptic solution or systemic antibiotics to prevent secondary infection can be considered. In addition to the removal of larvae, it is important to identify and modify the predisposing factors and properly educate the patients.

Our patients had a history of leg edema, poor hygiene, and taxane-based chemotherapy, previously reported as predisposing factors for subungual myiasis. Furthermore, onycholysis was observed in both cases. These nail changes were also reported as accompanying symptoms in previous cases, and this study suggested that these nail deformities also served as predisposing factors. In conclusion, we reported rare cases of subungual myiasis that reflected its predisposing factors well. Subungual

myiasis should be considered and appropriately managed in patients with these predisposing factors.

Conflicts of interest

None disclosed.

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