Case Report

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Myiasis of open great toe fracture wound: a rare case report

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Introduction and importance: Myiasis of an open fracture wound is very rare but can occur due to neglect of wound care.
Case presentation: A 12-year-old boy from a low socio-economic background, following an impact injury in his right great toe 10 days back presented with complaints of pain, swelling, and a foul-smelling odor from his right great toe. On examination, a swollen, tender puncture wound was noted over the dorsal aspect of the great toe revealing part of live larvae and serosanguinous discharge. Management was done with the complete removal of maggots, wound debridement, wound lavage, administration of systemic antibiotics, and toe guard slab application.
Clinical discussion: Wound myiasis results from a facultative or obligatory parasite that is initiated when flies oviposit in hemorrhagic, necrotic, or pus-filled lesions. The possible complications of myiasis include local destruction, invasion into deep tissues, and secondary infection, which could result in amputation of the affected area, especially where obligatory parasites are concerned.
Conclusion: Myiasis commonly occurs due to poor hygiene and neglect of wound care along with many other risk factors. Early proper wound care prevents the development of wound myiasis and early diagnosis and treatment of myiasis prevent complication of local tissue destruction and amputation of affected parts.

Keywords: debridement, maggots, myiasis, open fracture, wound

Introduction

Myiasis is an infestation of tissues of humans and other living vertebrates by dipteran larvae (maggots) that feed on the host's necrotic or living tissue[1,2]. It commonly occurs in domestic and wild animals; however, it can be seen rarely in humans also[1]. It is a well-recognized but serious medical complication of neglected wounds[1,3,4]. There are very few cases of digital wound myiasis reported till date[5].

Herein, we report a case of open great toe fracture wound myiasis, a rare presentation of a neglected wound in a 12-year-old boy. This work has been done in line with the Surgical CAse REport (SCARE) Guideline[6].

Case presentation

A 12-year-old boy with no known comorbidities presented with chief complaints of pain, swelling, and a foul-smelling odor from his right great toe. The patient suffered an injury to his right great toe while playing football, but kept it hidden due to fear of his parents and did not seek immediate medical care; instead, he used an old torn cloth to control the bleeding and cover the wound. There was no significant past medical history and no family history of chronic diseases like diabetes mellitus, hypertension, and similar conditions.

About 10 days after the injury, the patient developed severe pain followed by a foul-smelling odor from his right great toe, which was noticed by his mother so they presented to the emergency department. Examination revealed a swollen,

HIGHLIGHTS

- Myiasis is an infestation of tissues of humans and other living vertebrates by dipteran larvae (maggots) that feed on the host's necrotic or living tissue.
- Wound myiasis results from a facultative or obligatory parasite that is initiated when flies oviposit in hemorrhagic, necrotic, or pus-filled lesions.
- Living in rural areas, having a low standard of living, being in close proximity to domestic animals, homelessness, psychiatric illness, diabetes, severe handicap, alcoholism, neurological condition, abuse, and negligence are risk factors for human wound myiasis.
- The possible complications of myiasis are local destruction, invasion into deep tissues, and secondary infection, which could result in amputation of the affected area, especially where obligatory parasites are concerned.
- Treatment of wound myiasis includes removing all larvae, debridement of necrotic tissue, intensive washing with antiseptic solutions, using sterile dressings, and administering systemic antibiotics for treating and prevention of secondary bacterial infections.

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tender ulcerated wound measuring ~3 cm × 2 cm over the dorsal aspect of the great toe with a pocket-like wound from where serosanguinous discharge was seen. On exploration of the wound, one could observe live larvae infesting the healthy tissue (Figs 1 and 2). The wound had extended up to the distal phalanx fracture of the right great toe as seen in the plain radiograph (Fig. 3). Blood investigations revealed leukocytosis (13 000/cumm), eosinophilia (10%), increased ESR (30 mm/h) and CRP level (60 mg/l). Other investigations: liver function test, renal function test, and random blood sugar were within the normal range.

Maggots were seen by the naked eye, turpentine oil was applied hourly, and a total of 10 maggots were isolated finally. Broad-spectrum antibiotics and tetanus prophylaxis was initiated. Wound lavage and debridement were done properly by the main author himself and the limb was splinted. The wound was healing with healthy granulation tissue on a follow up visit after 2 weeks (Fig. 4).

Discussion

'Myiasis' term, derived from the Greek word 'myia' meaning fly, was first proposed by Hope (1840) to refer to the disease of man and animals originating specifically with dipterous larva other than those by insect larvae in general[1,7]. Myiasis is classified into cutaneous; including furuncular and migratory, wound myiasis, and cavitary myiasis including cerebral myiasis, aural myiasis, nasal myiasis, and ophthalmomyiasis according to anatomy[8]. Among these, cutaneous myiasis, together with wound myiasis, is the most frequently seen clinical form[2,8]. Ecological classification takes into account the parasite and host relationship: obligatory myiasis,

Figure 1. Open fracture wound myiasis at the time of presentation with right toe swelling and pocket-like hole.

Figure 2. Maggots seen in the open wound extending to the distal phalanx fracture of right great toe.

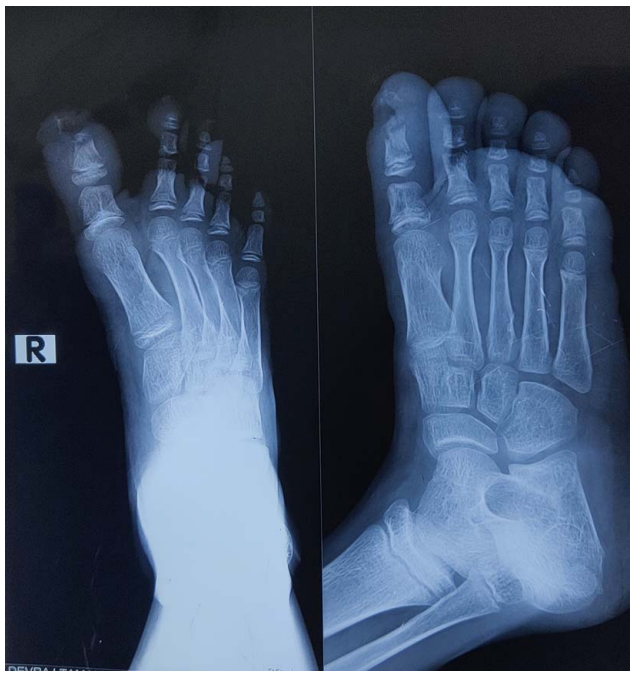

Figure 3. Distal phalanx fracture of the right great toe.

Figure 4. Healed myiasis wound after 2 weeks.

facultative myiasis, and accidental/pseudomyiasis. Obligatory myiasis develops by the obligatory maggots which are invasive and can infect living tissue whereas facultative myiasis is caused by maggots that prefer to infect dead or living hosts' necrotic tissue. Accidental myiasis/pseudomyiasis develops when the larva or egg of certain flies accidentally come in contact with the host causing a pathological reaction[2,8,9].

Wound myiasis results from a facultative or obligatory parasite that is initiated when flies oviposit in hemorrhagic, necrotic or pus-filled lesions[2,8]. Common flies that cause wound myiasis include screwworm flies such as *Cochliomyia hominivorax* and *Chrysomya bezziana*, and *Wohlfahrtia magnifica*[3,8,9]. In our case, maggots were seen deep inside the healthy tissue of the open wound of the right great toe, which are suspected to be *C. hominivorax*. The affected toe of our case was swollen with a pocket-like deep wound. However, the identification of maggot was not done in our case.

Living in rural areas, having a low standard of living, being in close proximity to domestic animals, homelessness, psychiatric illness, diabetes, severe handicap, alcoholism, neurological condition, abuse, and negligence are risk factors for human wound myiasis[2,5,7,10]. In our case, the boy from a low socio-economic background but without any other risk factor, did not inform his parents about the open fracture wound of his great toe because of fear of being scolded. He instead covered the wound with untidy cloth, which led to the myiasis.

The possible complications of myiasis are local destruction, invasion into deep tissues, and secondary infection, which could result in amputation of the affected area, especially where obligatory parasites are concerned[2,5,8]. In our case, the wound was extended to the distal phalanx fracture of the right great toe, which might be the complication of myiasis.

There is a paucity of literature of digital myiasis reported. A case report of a 41-year-old female from Brazil, following a knife injury to the second finger of her left hand was presented after 6 months in an advanced stage of the myiasis, with a large area of finger necrosis and amputation and visible live larvae, associated with cellulitis extending from the finger's base to the hand. She was treated with surgical excision (metacarpophalangeal disarticulation) and mechanical removal of 132 live maggots[5].

Subungual myiasis, one of the rare forms of digital myiasis had been reported in patients with risk factors like ingrown nail, taxane-based chemotherapy induced onycholysis, peripheral neuropathy due to diabetes, edema, or venous dysfunction, and subungual hematoma[11–14].

Cases of painful toe myiasis presenting as a nonhealing puncture wound[15] and little finger myiasis presenting as a painful pinpointing wound following an insect bite[10] were reported to be caused by botfly.

Treatment of wound myiasis includes removing all larvae, debridement of necrotic tissue, intensive washing with antiseptic solutions, using sterile dressings, and administering systemic antibiotics for treating and prevention of secondary bacterial infections[1,5,7,8]. These measures were taken in our patient along with splinting the limb for the distal phalanx fracture of the right great toe. A learning point from our study is that proper and timely wound care of myiasis wound prevents from grevious complications like amputation of the affected part.

Conclusion

Myiasis of an open toe fracture wound is rare but can develop due to neglect of wound care. Myiasis occurs due to poor hygiene and neglect of wound care, which is a public health problem in developing countries. Delay in seeking medical care, delayed diagnosis, and continuing unnecessary and ineffective antibiotics might lead to local tissue destruction and eventually lead to amputation of the affected part.

Ethical approval

This is a case report. Therefore, it did not require ethical approval from the ethics committee.

Consent

Written informed consent was obtained from the patient and patient party for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

S.K.K.: contributed in the process of original draft preparation and editing of final manuscript; S.B., S.B.D., A.P., and S.J.: contributed in review and editing of final manuscript. All the authors approved of the final version of the manuscript and agreed to be accountable for all aspects of the work ensuring questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflicts of interest disclosure

No conflict of interest.

Research registration unique identification number (UIN)

None as this is a rare case report; however, is not 'first in man' case report and no new surgical techniques or new equipment/technology was used.

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Availability of data and materials

Upon request by Editor-in-Chief. The data is available from the corresponding author.

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