

Case Report

An interesting case of neonatal aural myiasis in a 13 hours old neonate in a tertiary care hospital

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Received: 29 September 2021

Revised: 11 October 2021

Accepted: 15 October 2021

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ABSTRACT

Myiasis is infestation by fly larvae (diptera) in live vertebrates, including humans. Newborn period is very unusual for any infestation. In literature there are only a few cases reported of neonatal aural myiasis from India. We described a case of aural myiasis caused by the Sarcophagidae family in a 13 hours old newborn in this paper. Aural myiasis in a newborn can be dangerous because of the fatality risk due to penetration to the brain.

Keywords: Neonatal, Aural, Myiasis

INTRODUCTION

Myiasis is a type of parasitosis which involves the infestation of living vertebrate animals with fly larvae which feed on host's necrotic or living tissue, liquid body substances or ingested food.¹ Worldwide distribution of myiasis has been known. It mostly occurs in poor socioeconomic regions of tropical and subtropical regions.

Aural myiasis is the infestation of the external ear and/or middle ear with dipterous larvae. It is a type of cavity myiasis. The mortality rate is as high as 8% when myiasis of the ear and nose lead to infestation of the brain.² Early intervention is necessary to avoid complications like deafness or intracranial extension.³

Diagnosis is mostly made by history and clinical examination. Further examinations are necessary when expansion to the middle ear is suspected.³

CASE REPORT

A 13 hours old newborn was referred from a private hospital to our tertiary care hospital in April 2021 for complaints of respiratory distress. The baby was born full-

term at a private hospital by lower section caesarean delivery for non-progression of labor to a 25 years old mother.

At birth, the baby required 30 sec of positive pressure ventilation and had labored breathing. Baby was started on free flow oxygen and transferred to our hospital. On admission, the baby weighed 2900 g with 38 weeks of gestation age (Ballard score), his body temperature was 36.6°C, respiratory rate was 68/min and heart rate was 140 beats per min with capillary refill time of 3 sec and saturation 98% on oxygen by nasal prongs. He had moderate retractions with Downe score 4. He was active, cried spontaneously, and with fontanel soft at level.

Baby was immediately started on intravenous fluid and respiratory support (CPAP) in view of respiratory distress after sending initial sepsis workup. While sponging at 13 hours of life, inflammation of the left ear was noticed. On probing moving objects were seen emanating from the entrance of the aural cavity (Figure 1).

His left ear was then irrigated with normal saline using 10 ml syringe and 18-gauge cannula creating a localized tissue hypoxia. This prompted maggots to escape outside

which were removed manually with the help of micro-forceps (Figure 2). A total of 23 maggots were isolated. Four maggots in 70% alcohol were sent to the entomology unit. The specimens were examined under a microscope at 400X magnification.

Ear examination revealed erythema of the left auditory canal with some laceration. Otoscopy could not be done at that point due to debris in the ear canal. Turpentine oil mixed with glycerin was started topically thrice a day. Baby was isolated. Next day, again a few larvae were seen coming out from the ear cavity (Figure 3). Ear toileting was done which revealed copious ear discharge. Pus was sent for a microbiological examination.

Aural toileting was done daily till discharge was present. Topical and systemic antibiotics were added in view of suspected chances of meningitis. Laboratory findings of this newborn showed a white cell count of 26,600/mm³ consisting of 62% neutrophil and 28% lymphocyte; also, serum creatinine 2.22 mg/dl and urea 46.9 mg/dl. Transcutaneous bilirubin and blood sugars were normal and blood gas showed metabolic acidosis and increased lactate of 4.6. Lumbar puncture was done to rule out meningitis.

Baby's respiratory support and intravenous fluid was gradually tapered over 48 hours, started on enteral feeds and antibiotics were stopped after 5 days when reports were normal and the baby clinically well. Parasitology examination from the entomology department revealed the maggot as 2nd instar of *Sarcophaga* sps.

All reports of blood culture, pus culture and cerebrospinal fluid were reported normal. Ultrasound cranium was done at discharge which was reported normal. Otoscopy was done at discharge and showed no larvae with intact tympanic membrane. MRI brain examination was not carried out as the tympanic membrane was intact. The patient's mother was consulted by the gynecology department to exclude intrapartum infestation of the larvae. The examination showed no genital lesions. The newborn was asked to visit the otorhinolaryngology department one week later and had a good clinical examination.



Figure 1: Larvae from left ear at 13 hours of age as found in gross examination.



Figure 2: Gross appearance of removed live maggots.



Figure 3: Larvae at 19 hours of age with erythema and ear discharge.

DISCUSSION

Myiasis is a relatively common public health problem in developing countries, mainly in hot tropical areas. Zumpt described myiasis as the infestation and invasion of living human and vertebrate animal tissue by dipterous larvae. Most cases in literature are reported in children or adults with mental retardation. Any cutaneous tissue, body cavity, or body organ can be attacked by these larvae.¹ In neonates mostly umbilical and cutaneous myiasis have been reported with few cases of aural myiasis (Table 1).

In literature reviews, the most common fly reported for aural myiasis is *W. magnifica* from the family Sarcophagidae. It has been the most common causative agent for aural myiasis in Russia, Turkey and Israel and the middle and far east countries.¹ They are classified as ecologically obligatory, facultative or accidentally localized parasites. Anatomically they are classified according to the location of the larvae in the host. They may be primary or secondary depending on the host and order of invasion.¹ Patient related risk factors for myiasis in humans are poor hygiene, low socio-economic status,

immobility, altered consciousness, paralysis and hypoaesthesia. Environment related risk factors for myiasis in humans are tropical and subtropical areas, absence of screen on windows, summer season (warm climate), overflowing garbage bins and food containers left uncovered in rooms.¹¹

In our case larvae were noted at age 13 hours of life; thus, it is likely that the infestation occurred within the first few hours of life. There was no evidence of vaginal myiasis in the mother, so highly unlikely that larvae were acquired from the mother. In addition, the unusual presence of a fly in the nursery may have been related to the infestation. Facilitatory conditions in this case include the infant's inability to fend off the fly, the likely presence of bloody mucoid secretions in the aural orifice immediately after delivery, the hot and humid climate during the delivery and the uncovered anatomical waste in delivery room.

Based on the presence of two respiratory slits each in the posterior spiracles, the 4 maggots were identified as Sarcophagidae family, in the stage of 2nd instar larvae. The other distinct features of Sarcophagidae are the possession of thin incomplete peritreme with respiratory slits directed away from the opening, and the cephalopharyngeal armature with the split of dorsal cornu. Although the life cycle of a fly depends on species and types of exposure, infestation usually involves flies leaving their ova on intact skin, wound or necrotic tissue. Larvae hatching from the ova pass into adjacent tissues, and complete their life cycles, and transform into adult forms. This process is repeated in 3 stages (or instars) before the skin hardens as the maggot forms into a pupa from which an adult fly then emerges. Sarcophagoides being larviparous deposit larvae directly onto a breeding medium. Some species occasionally lay eggs. The fly may also drop its eggs while in flight on the skin, wounds or natural openings.

In the absence of the certain features attracting the species to induce myiasis (exposed wounds, necrosis, ulcerations, etc), a female sarcophaga lays larvae in an anatomical cavity that doesn't have a continuous water flow. The duration of postembryonic development (egg to larval forms) varies depending on nutritional deficiencies, temperature, season, crowding, and the sex of the individual. These larvae are able to survive inside deep tissue by breathing through a small hole.¹¹

The clinical symptoms of aural myiasis include larvae seen on external ear canal, aural malodour (if in wound bed), purulent or hemorrhagic ear discharge, ear pain and itching presenting as irritability. In older children larvae can cause itching, perforation of tympanic membrane, tinnitus, vertigo, deafness, intracerebral myiasis causing meningitis and deaths in some cases.¹² It's usually unilateral, and can be bilateral in some cases.

Diagnosis is straightforward by identification of the maggot through physical examination and in some cases through through diagnostic images. The maggots should

not be hastily discarded. For etiological diagnosis, the larvae should be immersed in hot water for 30 sec to retain length and morphology and then preserved in a 70-90% ethanol solution or isopropyl alcohol and should be submitted to a center of entomology, parasitology and vector control to identify and preserve the larvae.¹³ The natural history of each species suggests its potential for invasiveness.

Otomyiasis is generally a self-limiting disease. Larvae usually leave the host when they become adult larvae. However, during this period because of both mechanical effects of larvae, and collagenases they secrete, they induce many complications in the patient. These complications can include perforation of the tympanic membrane, destruction of the middle ear, and mastoid cavity, and fatal central nervous system invasion. The most important point in the prevention of complications is early diagnosis, and eradication of the larvae as soon as possible.

Treatment consists of mechanical cleaning irrigation of the ear canal with normal saline or 70% ethanol followed by direct or surgical extraction of larvae using alligator forceps or fine forceps, sometimes with the help of anesthesia and operating microscope. It is important to avoid crushing any flies directly while removing them, as this can leave eggs. It is not advisable to kill the maggots in the ear, as this will make them difficult to find, and any dead maggots remaining in the ear can cause a foreign body reaction.¹⁴

Occlusion or asphyxiating therapy inform of turpentine, olive oil, petroleum jelly, povidone iodine solution, ether, 10% chloroform act as topical irritant and block the larvas respiratory sinuses, forcing these aerobic organism to come up to surface in search of oxygen. Turpentine or ether is not recommended in western literature as it could lead to complications such as anaphylaxis and sepsis. Ivermectin was reported safe for human use.¹⁵

Local application of ivermectin paralyzes the parasite and kills the larvae, facilitating the extraction and relieving pain.¹⁶ But availability of topical ivermectin freely in the Indian market is still an issue, so have to rely on old dated less sophisticated asphyxiating agents. Topical anthelmintic medication, bactericides, tetanus toxoid vaccine and systemic antibiotics should also be considered to prevent secondary sepsis. Regular aural toilet is important for pus evacuation.

It is better to take preventive strategies like birthplace cleanliness and environmental sanitation. Control of fly population by killing adult flies, elimination of breeding areas, nets for windows, UV-a traps, insecticide spray, boric acid at the bottom of dumpsters located outdoors and automatic misters, use of repellents, reduction of odours of decomposition and cleaning and covering of wounds are some of the effective means of prevention of myiasis. General cleanliness can be improved by not leaving open food containers in room, keeping garbage receptacles covered with lid, and regular review of storage and food preparation stations maintaining good sanitation.

Table 1: Summary of few reported cases of neonatal aural myiasis.

S. no.	References	Age	Site	Country	Family	Genus
1	Bowle et al ⁴	55 days	Ear	Cuba	Calliphoridae	Phaenicia
2	Bapat ⁵	07 days	Ear	India	Calliphoridae	Calliphora
3	Centinkaya et al ⁶	12 days	Ear and eye	Turkey	Calliphoridae	Lucilia sps.
4	Jain et al ⁷	1 day	Ear	India	-	-
5	Ahmad et al ⁸	2 days	Ear	Peninsular Malaysia	Sarcophagidae	Sarcophaga sps.
6	Chaiwong et al ⁹	5 days	Ear	Thailand	Parasarcophaga Dux	-
7	Kamble et al ¹⁰	17 days	Ear	India	Calliphoridae	Calliphora
8	Hernando et al ¹¹	2 days	Ear	Indonesia	Sarcophagidae	Sarcophaga sps
9	Our case	13 hrs	Ear	India	Sarcophagidae	Sarcophaga sps

Tracking the case is helpful in finding the places where authorities need to improve sanitary measures.

CONCLUSION

Aural myiasis is a rare but benign infestation of the ear by fly larvae, most commonly by species of the Calliphoridae and Sarcophagidae family. The overwhelming majority of cases can be successfully managed with manual extraction of maggots and asphyxiating agents along with topical antibiotics without the need for surgical intervention. Intracerebral myiasis can be caused by the transaural migration and invasion of fly larvae can be prevented by early detection and treatment. Preservation and identification of larvae is essential for pathogenesis and knowing invasiveness potential. Good sanitation, maintaining proper hygiene and vector control is key to prevention.

ACKNOWLEDGEMENTS

Authors would like to thank the patient and her relatives for permitting to share the case for publication.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Bharti AK, Kishore J, Dixit A. An interesting case of neonatal aural myiasis in a 13 hours old neonate in a tertiary care hospital. *Int J Contemp Pediatr* 2021;8:1895-8.