INTRODUCTION

Myiasis (from Greek *myia*, or fly) is defined as the parasitic infestation of live tissue with larvae (maggots) of a variety of fly species within the arthropod order Diptera. These larvae grow in the host and feed on its living or necrotic tissue [1]. Myiasis is mainly a disease of animals albeit human infestation can also occur especially in whom living in poor hygienic conditions. Several species of flies can parasitise humans but the most common are the human botfly (*Dermatobia hominis*) and tumbu fly (*Cordylobia anthropophaga*) [2]. The infestation is commonly seen in children younger than 5 years especially in those living in rural and endemic areas [3]. The two main clinical varieties are wound myiasis and furuncular (follicular) myiasis while other forms, including creeping myiasis and cavitary myiasis of body organs, are relatively uncommon [4]. Umbilical cord myiasis of the human during the neonatal period is extremely rare and is almost confined to the South American tropical zone [3]. In this piece of research, we report a relatively uncommon case of umbilical myiasis in a healthy male newborn infant of Al-Mikhwah city, Saudi Arabia.

CASE REPORT

An 11-day-old male baby was admitted to Al-Mikhwah general hospital, South Western Saudi Arabia, with history of umbilical discharge and tiny white “worms” coming out from the umbilicus for 1 day. The baby was born by normal spontaneous vaginal delivery for uneventful pregnancy of a
Umbilical myiasis in a healthy newborn

30-year-old healthy Saudi Arabian woman in Al-Mikhawah general hospital after 38 weeks of gestation (booked mother G5P4A0). Apgar score was 9 and 10 at one and five minutes respectively, with stable vital signs and normal appearance of the baby without any dysmorphic features or clinical abnormalities. The mother and infant were discharge on the second day on breast feeding and Vit D3 (400 IU). Upon examination, the infant weighed 3.9 kg, core body temperature was 38.7°C, the heart rate was 168 beats/min and the respiration rate was 38 breaths/min. The anterior fontanel was at level, chest and heart sounds were unremarkable. The abdomen was slightly distended without abnormal underlying palpable structures. The umbilicus was mildly red, swollen and shows yellowish discharge (Fig 1). After cleaning with a cotton swab soaked in 4% chlorhexidine, a few tiny white fusiform moving larvae were observed. Initial investigations showed WBC 14.4 x 10^9/L, Hb 13.9 g/dL, and plasma glucose 66 mg/dL. Renal and liver functions and serum electrolytes were normal. Urine and blood cultures were negative, while culture from the umbilical discharge revealed *Staphylococcus aureus*. Abdominal ultrasound did not show abscess formation or fluid collection.

All larvae were extracted from the lesion by slight pressure and application of diethylther as a repellent, then the skin was carefully cleaned with 4% chlorhexidine. The infant was admitted to general pediatrics ward and treated with cloxacillin 50 mg/kg/12h IV for 3 days and local fucidic acid ointment till complete resolution of the periumbilical inflammation. The infant was then discharged with satisfactory clinical condition.

ENTOMOLOGICAL IDENTIFICATION

Following the removal of maggots from the umbilical epidermis, they were preserved in ethyl alcohol for parasitologic examination in King Fahad Hospital, Al-Baha and species identification. After the basic procedures of fixation, dehydration and clearing, the creamy white larvae were authenticated as typical second instars of *Cordylobia anthropophaga*. The larvae measured 5.3±0.9 x 2.5±0.2 mm in size, and the body is cylindrical and consisted of twelve segments with pointed anterior tip and a blunt caudal end. The segments from 3 to 8 are covered with tiny scattered black spines whereas segments 9 to 11 are typically bare. The twelfth segment contains few tiny spines (Fig 2). The morphology of the larvae is characteristic to the genus *Cordylobia* [5-6].

DISCUSSION

Myiasis is the invasion of living tissue with larvae of diptera (true flies) which usually affect animals albeit human infestation can also occur in rare instances, especially in those living in rural and endemic areas. Classification of myiasis can be done according to the site of infestation (e.g. cutaneous, nasopharyngeal, urogenital and visceral) and according to the species of the parasite [1, 7]. Anatomically, cutaneous myiasis - including wound myiasis and furuncular myiasis - is the most common variety, typically on the back of arms and legs. Worldwide, the vast majority of flies that cause the human infestation are *Dermatobia hominis* (botfly) and *Cordylobia anthropophaga* (tumbu fly) [3].

Although cases of cutaneous myiasis caused by tumbu fly
have been reported in travelers of endemic regions [8-9], the fly itself has been known to live in East and Central Africa [10]. In Saudi Arabia, little is known about the epidemiology of human myiasis in general, and *Cordylobia anthropophaga* in particular. The presence of tumbu fly in Saudi Arabia was first reported by Büttiker *et al.* in 1980 [11]. A single case of cutaneous myiasis caused by tumbu fly larvae was later reported in the province of Asir, South Western Saudi Arabia [12]. More recently, Afifi and co-workers [13] have also reported a case of cutaneous myiasis, caused by *Cordylobia anthropophaga*, indigenously acquired in Al-Baha province which includes a number of cities such as Al-Mikhwah South Western Saudi Arabia (Fig 3).

Umbilical myiasis is a form of cutaneous myiasis that is rarely seen in newborn infants. The female tumbu flies lay their eggs on the wet contaminated skin of umbilicus. The eggs hatch in 1-3 days, depending on the temperature, and the hatched larvae subsequently penetrate the inflamed skin and develop into the prepupal stage after passing through three larval stages [3]. Secondary bacterial infection of the affected site, especially with *S. aureus* is not uncommon.

Species identification is very essential in the diagnosis of myiasis; in our case, the causative species was *Cordylobia anthropophaga* which is known to breed in human feces, meat and fish but occasionally may breed on contaminated wounds and skin creating a trajectory for skin flora and pathogenic organisms to cause sepsis. In neonates, omphalitis can quickly progress to sepsis and represents a potentially life-threatening infection [14]. In our case, culture from the umbilical oozing revealed infection with *S. aureus* and there was mild fever, while physical examination did not recognize other potential sites of infection suggesting that omphalitis is the preliminary source of pyrexia. To further exclude the presence of septicemia, sample of blood was sent to culture and fortunately it proved negative. Likewise, sample of urine was also cultured to exclude urinary tract infection. Additionally, abdominal ultrasound was necessary to exclude fluid collections or abscess formation.

Although the medical management of myiasis is straightforward and mainly relies on the removal of maggots and cleaning of the infestation site [15], but in our case the use of systemic anti-staphylococcal penicillin, such as cloxacillin, together with topical antibiotic ointment was strongly recommended [16]. In rare cases, surgery may be required if there is excessive necrotic tissue or pus collection, a two conditions that were not present in our case.

In conclusion, although human myiasis is generally rare and sometimes omitted, but umbilical myiasis may progress to life-threatening sepsis and/or visceral infestation especially in neonates due to the easy access to blood stream and intra-abdominal tissues. This emphasizes the importance of patient education and improving the access to maternal health care in rural communities to determine which behaviours the hygiene educational programme should seek to promote in the community.

**Conflict of interest**

The author declares that he has no conflict of interest.

**Funding**

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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