

Myiasis in an intensive care unit in the United States: A case report

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Abstract

A 76-year-old female patient entered a local hospital in Southern United States to undergo routine robotic surgery. She reportedly developed complications after surgery and was transferred to the Medical Intensive Care Unit (ICU), where she was intubated and placed on a ventilator for life support. Twelve days into her hospital stay, she suffered a cardiac arrest and became physically and mentally impaired and later died. During her hospitalization, there were three different instances where maggots were found in and on the patient. Consequently, her family is suing the hospital for abuse and neglect of a vulnerable adult, as well as intentional infliction of emotional distress. We discuss the definition of Hospital Acquired Infections (HAI) as described by the Centers for Disease Control and Prevention to determine if this case is associated with hospital acquired transmission, as well as prevention strategies to prevent myiasis from invading other ICU patients. We inform for practice by revealing the consequences of actions or inactions of Healthcare Workers.

Keywords

myiasis; maggots; flies; hospital

Introduction

Myiasis is infection that may be caused from flies at the larval stage (maggots), [1]. Myiasis typically occurs in livestock such as cows and goats and is predominantly found in tropical, unindustrialized countries [2]. The most recent published case reports of myiasis focused on international occurrences Italy, Iran, Korea and India [2-5]. This case report offers a unique experience to analyze a rare reported incident of myiasis that occurred on U.S. soil in recent history. Reported cases of myiasis in the U.S. are associated with people who came into contact with wild or farm animals, indigent populations, patients with peripheral vascular disease, alcoholism and cancer [6]. Myiasis also occurs in slum areas where the level of sanitation is poor, in people of low socioeconomic status, the elderly, ill, intellectually disabled, drug addicts and in patients with poor oral hygiene [5]. When maggots are found in the human mouth, it is considered a form of wound myiasis, which is likely the result of poor oral hygiene [3]. The most common fly that causes myiasis is the dipteran clade Calyptratae which consist of nearly 18,000 species, of which blow flies, flesh flies, bot flies and dung flies have been implicated with causing myiasis in humans [3]. The impact of myiasis on the human body ranges from benign and

asymptomatic to a grave situation [2]. This paper reports on a case of myiasis found in, and on a debilitated patient in an Intensive Care Unit (ICU) in a metropolitan area of the United States. We also discuss the definition of nosocomial infection as described by the CDC, to determine if this case is associated with hospital acquired transmission.

Case Description

June 30, 2016, multiple news sources reported that a patient's family filed a lawsuit against an urban academic hospital alleging that maggots were found in a patient's mouth while in an ICU [7-9]. The patient, a 76 year-old female, entered the hospital to have routine robotic surgery [10], to remove a tumor from her lung [11]. Bourne (2016) reported that the lawyer representing the interest of the patient provided some of the medical records to the media and those documents have gone viral. On the internet, we went to Google Images, entered the patient's name and the words "medical records," and four different pages of the patient's medical records were found.

The shift assessment/reassessment record on December 1, 2015 at 8:00 a.m., revealed the patient was on a ventilator, with stable vital signs: Pulse 96, Respirations (RR) 14, Blood Pressure (BP) 101/63; mean arterial pressure 76, and oxygen saturation 99%. Staff comments states "noted maggots coming from oral cavity when patient orally suctioned. Dr. Beacher and Dr. Bates aware. No verbal orders taken." Later on the same day at 2:25 p.m., a physician completed an anesthetic pre-assessment/history and physical for a tracheostomy. This evaluation displayed more background of the patients' medical status. The assessment of her central nervous system revealed the use of chronic benzodiazepine, that she suffered from chronic pain, possible chronic encephalopathy on November 19th and unresponsiveness. The pulmonary assessment showed previous surgery performed to the left upper lobe on November 13th, 2015. The patient was extubated after the procedure and was transferred to the step down unit on November 16th. She was then re-intubated on November 16th for a period of seven days and then extubated, but within a calendar day, the patient was re-intubated. The assessment of the patient's head, neck and airway revealed larvae during oral care on November 30th (see Figure 1 for timeline of intubations and extubations). Examination of her circulatory system revealed asystolic arrest, possibly due to pulseless electrical activity on November 25, 2015 with elevated troponin levels. Laboratory results revealed leukocytosis WBC (22,000/mm³), normal blood levels of (Hb: 12.7, Ht: 39%), normal platelets (217,000 mcl), Blood chemistries revealed normal sodium (140 mEq/L), normal potassium (4.1 mEq/L), slightly elevated chloride (108 mEq/L), decreased Calcium (7.2 mg/dl), normal CO₂ (25 mEq/L), slightly elevated BUN (22 mg/dl), decreased Creatinine (0.4 mg/dL) and elevated glucose of 143 (mEq/L). Arterial Blood Gas (ABG): Normal ph 7.45; decreased PaCO₂ (32 mm Hg), normal PaO₂ (105 mm Hg), RR 22 on 30% oxygen. The HCO₃ was not stated in the assessment, but overall the ABG was leaning towards respiratory alkalosis. Antifungal and antibiotic therapies were meropenem, micafungin, and vancomycin. Vital signs were Temperature 98.1, HR 85-109, RR 14-30, BP 104/62 to 157/93, O₂ saturation 99-100%. This assessment also revealed a diagnosis of acute respiratory distress syndrome and healthcare-associated pneumonia. Two days later, on December 3, 2016 an assessment of the skin states "on skin of inner left thigh is a wiggling worm? approx. 5-7mm long w/ a tiny black appendage at the tip, seemed to almost have implanted into skin although when removed, skin beneath it appeared completely normal. Body and bed inspected with no other organisms seen," (see Figure 2 for

timeline of discovery of larvae).

In a televised broadcast, John Bachman (reporter) of Action News JAX reported on the evening news that the patient's son said he was watching the Jaguar's game with his mother two weeks into her hospital stay when she started acting strangely. On the same televised broadcast, the patient's son spoke about his mother declaring that, "at one point, she started jutting her jaw out like she was trying to say something, the hard part for me is that in her own way, she was trying to tell me what was happening." Bachman continued to say that the news station reached out to the Joint Commission (who is the accrediting body for the hospital) about these claims and an agency spokesperson could not tell if the Agency investigated this specific case, but did say it evaluated a similar concern and worked with the hospital to address it. The patient has subsequently died and the family is suing the hospital for elder abuse, medical malpractice and is seeking damages in excess of \$15,000.

Discussion

Several classifications exist for myiasis depending on the area of the body in which the larva exist [6]. Court documents revealed that one or more maggots were found in, and coming out of the patient's mouth which were recognized while staff was executing oral care. Maggot(s) were also attached to the patient's bed linen and on her left inner thigh. Hospital acquired myiasis refers to patients who developed the infestation while hospitalized [6]. Generally, once a patient is admitted to a hospital, the cut-off time to determine if an infection is hospital acquired or community acquired is 48 hours [12]. However, it is unknown as to whether flies deposited eggs in, or on this patient, or whether she was infested with maggots prior to her admission to the hospital. The allegations are that the patient entered the hospital for a surgical procedure on November 13, 2015 to undergo routine robotic surgery, and remained in the hospital for 28 days [10]. The court records states that 17 days into the patient's admission, maggots were observed in, and coming from the patient's mouth during suctioning. In the patient's medical record, there were three separate instances where maggots were noted (see Figure 2 for timeline). This patient spent most of her hospitalization days in the ICU. Furthermore, she was intubated on three different occasions and extubated twice. The first larvae were found 17 days into her hospital stay and according to the CDC, that is well beyond the 48 hours cut-off period to determine if the larvae were acquired in the hospital.

This patient had multiple intubations and extubations of her airway. It appeared that each time she was extubated; she had to be re-intubated within a calendar day. Of the 28 days she was hospitalized, 27 days were spent on a ventilator in the ICU. Besides the number of days being bedridden and on a ventilator, this patient had numerous other risk factors for myiasis, including cancer [6], and pneumonia [13].

Vulnerable patients should have an added level of protection to ensure proper hygiene to their bodies and environments [3]. Since oral myiasis is uncommon in urban communities, some clinicians may be ignorant of its presentation, therefore delaying potential lifesaving treatment [14]. When considering myiasis prevention strategies, hospitals should acknowledge that although staff is aware that flies are unhygienic, the staff may be oblivious that flies carry myiasis [13]. Therefore, the prevention of hospital acquired myiasis in an ICU should involve education for all hospital personnel, from the medical and nursing team, to the support staff including those who deliver the food trays and house

keepers who remove trash from the rooms. It takes a concerted effort to keep patients safe.

Oral hygiene and controlling the population of flies in and around a hospital can prevent myiasis, especially in patients who are physically, mentally and medically compromised [15]. The American Association of Critical Care Nurses [16] recommends that oral care be performed every two to four hours in the acute and critical care settings. Although Healthcare Workers (HCW) are encouraged to perform routine oral care on ventilated patients, the ramifications of not performing mouth care on those types of patients are rarely documented in the U.S. [14].

Strengths of this research were to analyze a modern occurrence of myiasis in a metropolitan region of the U.S., to determine if the larvae found were hospital-acquired, and to inform practice by revealing the consequences of actions or inactions of HCWs. Limitations of this report are a lack of information as to whether the larvae were identified using laboratory analysis. Secondly, all data were retrieved from court documents and news reports based on data the legal representative of the deceased patient supplied to the news media. Since all data were in the public domain, informed consent was not obtained from the patient's next of kin.

Once a patient is admitted to a hospital, the clock is ticking for the staff to find and determine if an infection exists. It is certain that a member of the medical team accessed the patient's airway within the first 24 hours of her admission to the hospital, since it was documented that the patient was intubated and extubated after a routine surgical procedure. Myiasis was not identified within the first 48 hours of admission, and according to the CDC's definition of a HAI, the infestation of larvae in and on this patient's body would be considered hospital-acquired. This case report provided a rare insight of a patient who was first found with myiasis 17 days into her hospitalization, of which 15 of those days were spent ventilated in an ICU. Although human myiasis is unusual in urban metropolitan hospitals, it does occur, and as in this case, the ramifications are distressful to families and humiliating to hospital staff.

Figures

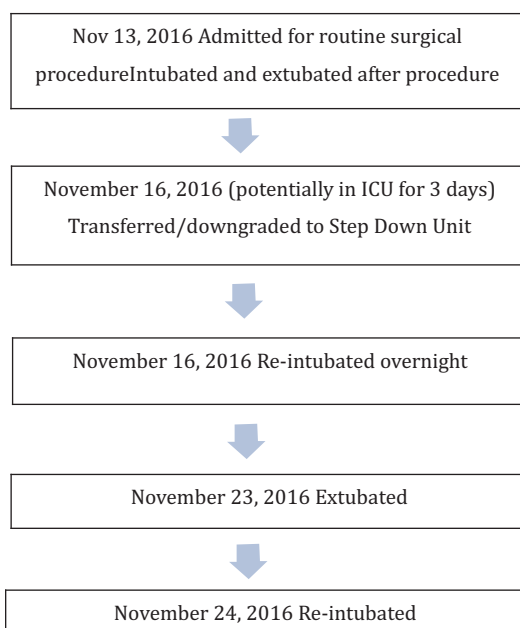


Figure 1: Timeline of intubations and extubations

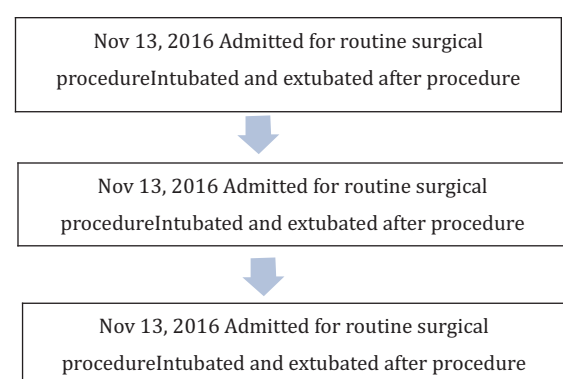


Figure 2: Timeline for discovery of larvae

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