

Travel-related issues and the morgue

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The paper by Leditsche et al. [1] in the current issue of the journal outlines a succinct protocol for dealing with potential cases of Ebola fever that may be encountered in the morgue. However, as well as detailing specific steps that should be taken in the case of Ebola fever, the report also raises the more general issue of particular types of diseases or injuries that may be encountered in travelers, including both tourists and workers visiting from overseas, and also in local residents returning home. Travelers may be exposed to infectious diseases that either do not occur, or are exceedingly rare in their country of origin. The recent striking example is Ebola fever in West Africa [2] as described in this issue [1], however dengue and malaria have been more constant problems for visitors; in the case of malaria this may be particularly so if prophylactic drugs have not been taken or drug resistance has developed. Dengue fever is increasing at an alarming rate and now poses a significant health risk to tourists in a number of regions worldwide [3]. Influenza pandemics are another example of situations where travelers to certain regions may be exposed to a potentially lethal variant that is not found in their home country. As Woodford noted “travelers have aided the international spread of infectious diseases since antiquity” [4].

A problem for forensic pathologists is that a history of recent travel may not be available, and the limited local experience in identifying the manifestations of certain conditions may lead to very low levels of suspicion at the time of autopsy. Conversely, while a presentation of fever,

with diarrhea and vomiting following overseas travel should always raise the specter of infection, alternative diagnoses such as colchicine toxicity should also be considered [5]. Prior antibiotic use or a prolonged post mortem interval for repatriated remains may render confirmatory cultures useless in cases of suspected bacterial sepsis.

With the development of efficient and rapid transportation systems, particularly in the latter half of the twentieth century, it has become possible to visit the most remote and inhospitable locations with relative ease. When the destination is known to be challenging, travelers tend to take precautions and equip themselves appropriately. Unfortunately if tourists perceive that the places to be visited are not too different from their home environment or are safe, they may be very poorly equipped to deal with particular local circumstances. Examples include encountering the proliferation of dengue-carrying mosquitoes in urban areas in Asia such as New Delhi, India, and potentially rabid monkeys in colonies near tourist resorts in locations such as Bali.

Expansion of the tourism industry in Australia has resulted in a steady increase in the number of overseas visitors. While many would assume that major hazards to visitors would come from the local fauna, deaths from snake, or funnel web spider bites are exceedingly rare, although occasional cases have occurred of tourists being taken by crocodiles while swimming in local water holes or at beaches [6].

Organized tourist activities such as diving and hot air ballooning have been associated with deaths with, for example, an American couple being left behind by a diving tour boat on the Great Barrier reef [7]. Traffic always poses a hazard and failure to remember the appropriate side of the road on which to drive may result in deaths from head on collisions. Pedestrians are also at risk of injury when

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crossing roads if they do not pay attention to regional road rules. Lack of experience in how to deal with local road conditions may also end in unnecessary tragedy. An example of that was a hired four wheel drive vehicle which became bogged beside the track in an isolated part of the Simpson desert in Central Australia. Simply letting air out of the tires would have increased the surface area and therefore traction, and enabled easy extrication of the vehicle. Instead the car was left behind by an occupant who died from hyperthermia/dehydration. Failure to understand local conditions has also resulted in deaths from falls, drowning, and hypothermia.

Elderly tourists may be at risk of death from natural diseases if medications are not regularly taken while traveling. Unaccustomed exercise in challenging conditions such as ascending Uluru (Ayers Rock) in Central Australia has also caused lethal cardiovascular events [8]. The excitement of traveling and feeling the need to participate in as many activities as possible may over-ride the caution that may normally be exercised at home.

Tourists may be given recreational drugs that would not be a normal part of their life at home and low tolerance or exposure to high doses may result in lethal outcomes. The death of a 42-year-old woman on a cruise ship in the South Pacific was attributed to such an episode [9].

Deaths of travelers in air crashes are fortunately rare but may arise from a variety of causes. The incorrect location of Mt Erebus on maps resulted in the deaths of 257 passengers in an Air New Zealand crash in Antarctica in 1979 [10] and the recent shooting down of a Malaysian Airlines aircraft over the Ukraine demonstrates the role that armed conflict may play [11]. Terrorist actions against tourists may take the form of attacks on passenger ships such as the *Achille Lauro* in 1985 [12]. The terrorist bombing in Bali in 2004 demonstrated an incident where many tourists were killed at the same time. Large numbers of deaths in tourist areas from natural disasters may also necessitate coordinated international disaster victim management exercises such as those that were undertaken for the drowning deaths after the South East Asian tsunami in 2006 [13, 14].

Murder is always a risk for tourists who may deliberately or inadvertently visit dangerous areas. In certain places the investigation of a suspicious death may be quite perfunctory if the decedent is not a national of the particular country where death occurred. This means that significant questions may remain unresolved after repatriation of the body.

At autopsy a number of issues arise. Foreign visitors may have potentially serious infectious diseases such as multiple drug resistant tuberculosis which may infect autopsy staff, and local experience of particular conditions such as echinococcosis may not be great [15]. Formal identification may be a problem if medical records and family members are

all overseas and early involvement of the appropriate embassy may be required. In the case of local tourists being repatriated from abroad there may be problems with the recorded cause of death necessitating a second autopsy. This may be complicated considerably by the initial dissections and by the changes caused by preservation/embalming of the body for transport. Identification of injuries or subtle organic disease may not be possible due to post mortem changes; these difficulties may be compounded if the original autopsy caused considerable tissue/organ damage from idiosyncratic dissection techniques.

Travel is clearly an activity that is not without risk. Deaths of tourists locally may be related directly to underestimation of the dangers of particular environmental conditions, lack of training, or awareness in how to respond to unexpected situations, or simply to accidents occurring during planned outdoor activities [16]. Deaths of tourists overseas may result in a number of additional difficulties for forensic pathologists associated with idiosyncratic local death investigations, body examinations, and autopsies, and dealing with preserved and/or fragmented repatriated remains. Heightened awareness of the possibility of an unusual and/or potentially highly infectious agent is now an essential requirement in the modern forensic morgue, although rare alternative diagnoses should not be forgotten. The fact that travel has been “inextricably linked” to the development of antibiotic resistance in numerous bacterial diseases is another point to consider [4].

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