Managing parrot bite injuries to the hand: not just another animal bite

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Abstract Bites and scratches are common injuries, frequently sustained from humans, dogs and cats. Exotic pet-related harm however is an important and increasingly emerging class of injury. Whilst the principles of prompt and thorough medical assessment, antibiotics and potential surgical washout and debridement apply, exotic pet wounds require further consideration. Standard antibiotic prophylaxis with amoxicillin/clavulanic acid (also known as co-amoxiclav) is not sufficient for the pathogens transmitted by parrot bites. We illustrate the importance of adequate consideration of microbiological pathogens with a case report of an open finger fracture resulting from a parrot bite. We intend this to be a valuable resource for healthcare professionals in their effective management of such injuries.

Level of Evidence: V

Introduction

Bites and scratches are common injuries, frequently sustained from humans, dogs and cats. Exotic pet-related harm however is an important and increasingly emerging class of injury [3, 4]. Whilst the principles of prompt and thorough medical assessment, antibiotics and potential surgical washout and debridement apply, exotic pet wounds require further

consideration. An appreciation of the underlying diversity of microbiological pathogens following such injuries is essential to guide the most appropriate treatment strategies. We present the case of an open phalangeal fracture caused by a parrot bite. This uncommon injury was managed with a tailored treatment after consideration of the risk of zoonoses such as psittacosis, pasteurellosis and nontuberculous mycobacteriosis, which are potentially carried in parrot saliva. Conventional treatment for animal bites using amoxicillin/clavulanic acid (also known as co-amoxiclav) was augmented with doxycycline to protect against these unusual pathogens.

Case Report

A 17-year-old man presented with a parrot bite injury to his left index finger. The patient had sustained the wound from a friend's parrot whilst petting it the day before, wherein the parrot had clamped onto the finger for a few seconds before letting go. The patient was otherwise healthy and systemically well. Examination revealed a jagged 6-cm laceration to the ulnar border of the left index finger (Fig. 1). The digit was neurovascularly intact but flexion was painful, and middle phalangeal tenderness was elicited. Extensor and flexor tendons were clinically intact, and there was no evidence of tenosynovitis. Radiography revealed an undisplaced fracture of the middle phalanx of the index finger (Fig. 2). The patient underwent formal wound washout and repair of the laceration. The fracture was managed conservatively with a splint. Wound swabs were inconclusive, and the patient was discharged based on microbiology advice with a weeks' course of oral amoxicillin/clavulanic acid and doxycycline. At review at 1 week, the wound showed no signs of infection and repeat radiographs showed no fracture movement.

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Fig. 1 Parrot bite to the ulnar border of the left index finger

Discussion

Injuries from exotic pets present a novel challenge to health services. Between 2004 and 2010, the National Health Service in England alone saw 760 consultations, 709 admissions and 2,121 hospital days as a result of exotic pet injuries [4]. Parrots, with colourful plumes and charming vocal abilities, are desirable pets. Such birds however can carry a wide spectrum of zoonoses which can be transmitted to humans.

Fig. 2 AP and lateral radiograph demonstrating an undisplaced fracture of the middle phalanx of the left index finger following a parrot bite

These illnesses may manifest with flu-like or respiratory symptoms (i.e. psittacosis), gastrointestinal symptoms (i.e. salmonellosis) or cutaneous symptoms (i.e. pasteurellosis), but not all are caused by bites that penetrate the skin. Unrelated skin trauma may also provide a route for nonbite-transmitted zoonoses if animals have been handled or hand hygiene is poor. The ability of an organism to cause illness depends on factors, including the route and level of exposure to the organism, the virulence of the strain and its ability to initiate the host's immune response.

The transmission of saliva and other wound detritus of parrots through broken skin can cause significant illness if left untreated. Psittacosis—known also as chlamydiosis, parrot fever and ornithosis—is caused by *Chlamydia psittaci* which has an incidence of 40 % in all birds [2]. Found in the respiratory and gastrointestinal tracts of parrots, transmission is most common through bites. Humans present with an atypical pneumonia with systemic malaise, and long-term sequelae include myocarditis and meningoencephalitis. Tetracyclines are the mainstay of treatment for both parrots and humans, but chloramphenicol or erythromycin are valid alternatives where tetracyclines are contraindicated. *Pasteurella multocida*, isolated from the nasopharynx of parrots, causes pasteurellosis and can be transmitted through bites or respiratory droplets. Systemic malaise may ensue if untreated and antibiotic treatment options include amoxicillin/clavulanic acid, doxycycline, amoxicillin or quinolones. Nontuberculous mycobacteriosis, resulting from *Mycobacterium avium*, is transmitted through talons, beaks and claws [1]. Most infections are asymptomatic but treatment includes macrolides, ethambutol and rifampin. Other zoonoses, including *Cryptococcus*, erysipelas and Newcastle disease are found in soil contaminated with infectious faeces. In the presence of

Fig. 3 Management algorithm for parrot bite injuries

broken skin, these can cause localized and systemic infections. Treatment for erysipeloid is with penicillin or erythromycin; for *Cryptococcus*, fluconazole is first-line.

Open hand fractures with potentially harmful bacterial contamination require thorough lavage, wound debridement and the appropriate prophylactic antibiotic therapy. Whilst some zoonoses respond well to conventional treatments, whether treated empirically or following a correct diagnosis, others will not respond favourably and may persist [3]. Most animal bites encountered are routinely treated with broad-spectrum antibiotics in the form of amoxicillin/clavulanic acid or an alternative for penicillin-allergic patients. Using first principles, however, the bacteria transmitted via parrot bites may not be covered by default treatment alone; habitual prescription of amoxicillin/clavulanic acid for animal bites, whilst simple, may not adequately provide the prophylactic cover for parrot bites expected from such a widely used antibiotic. We recommend therefore that patients presenting with parrot bites be treated with oral doxycycline as prophylaxis for pasteurellosis and psittacosis infection and cover skin contamination. Deeper wound with fractures, especially in the hand, require prompt surgical debridement, washout and intravenous antibiotics with the addition of amoxicillin/clavulanic acid (Fig. 3) and consultation with microbiologists. Wounds with absent or poor responses to antibiotic prophylaxis require prompt reassessment. Treatment for nontuberculous mycobacteriosis should only be commenced in positive swab cultures and organism sensitivities are confirmed.

Greater awareness of injuries from exotic pets and the medical sequelae of such wounds are important in enabling

clinicians to appropriately assess, treat and advise patients. As exotic animals become increasingly popular pets, treatment practices must adapt to cover the risk of unusual and potentially devastating infections.

Conflict of Interest Ian CC King declares that he has no conflict of interest.

Hannah Freeman declares that she has no conflict of interest.

James ET Wokes declares that he has no conflict of interest.

Statement of Human and Animal Rights This article does not contain any studies with human or animal subjects.

Statement of Informed Consent Informed consent was obtained for all images and identifying features removed for complete anonymity.

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